



RELATIONSHIP BETWEEN ECO-EFFICIENCY ON FIRM VALUE MODERATED WITH PROFITABILITY AND LEVERAGE

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ABSTRACT

A large number of potential investors begin to consider the idea of responsible investment social responsibility. However, the debate over whether the value should be added as an environmental consideration for the stock selection process is still being debated. This study tries to improve the efficiency, profitability and leverage hypothesis of firm value. The sample used was 81 manufacturing companies listed on the Indonesia Stock Exchange and sent in 2014-2018 and using the rupiah. The data analysis tool used in this study is multiple linear regression estimated with OLS (Ordinary Least Square). The collected data is then processed and tested using SPSS 22 software. Based on the results of research analyzing the effect of eco-efficiency on firm value with profitability and leverage on the manufacturing industry listed on the Indonesia Stock Exchange during the period 2012 to 2016, it can be concluded that there is a significant positive effect between eco-efficiency on firm value.

Keywords: Eco-Efficiency, Profitability, Environment & Firm Value

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INTRODUCTION

The hope of the community towards the company to be more environmentally responsible. In Indonesia, awareness of the need to protect the environment is regulated by Limited Liability Company Law No.40 Article 74 of 2007, where companies that carry out business activities in / related to natural resources are required to carry out social and environmental responsibilities. Environmental performance can be seen with reducing environmental impacts or restoring ecosystems creates a great demand for organizational resources (Law & Ibrahim, 2014). This large expenditure needs to be accounted for. There are processes in environmental recovery that lead to the emergence of eco-efficiency (Pacheco, 2019). The concept of eco-efficiency is the middle point between the economy and the environment. This concept is an efficiency that includes aspects of natural resources and energy or a production process that minimizes the use of raw materials, water and energy and the environmental impact per unit of product (Czyżewski et al., 2019; Gotze et al., 2019; Konstantas et al., 2019). A large number of potential investors begin to consider the idea of responsible investment social responsibility. However, the debate over whether the value should be added as an environmental consideration for the stock selection process is still being debated (Chaudron et al., 2019). Some groups stated that any attempt to improve social or environmental performance would reduce shareholder value (Wang et al., 2019). The research also confirms that improving environmental performance will lead to cost-efficient use of organizational resources so that businesses that are responsible for the environment will get higher profits which lead to an increase in the value of the company from less responsible companies. The company's management is demanded to be able to increase the welfare of the stakeholders and also faced with the interests to improve the welfare of their respective self. The company will calculate the revenue to be received during the operating period. This calculation tries to calculate the profits / benefits to be obtained and the costs of losses that will be borne as a result of environmental care. The profits on the company side are not certain to bring benefits to the community. The welfare of the shareholders can be seen from the value of the company. The value of the company is the price that is willing to be paid by potential investors if the company is sold, so it can be concluded that the value of the company is the price paid by investors if the company is sold (Hirose & Mishima, 2019). Company value can be seen from the market value or the market price of the company's shares (Duarte & Sarkar, 2011; Heikkurinen et al., 2019; Müller & Neubaeumer, 2018). The higher the stock price means the higher the rate of return to investors, so the value of the company is also higher. Financial decisions determined by financial managers will increase the value of the company or can even have a negative impact on the company. Some factors that affect the company's value are eco efficiency, profitability , and leverage (Gotze

et al., 2019; Konstantas et al., 2019). Eco-efficiency is the concept of efficiency in which there are aspects of natural resources and energy that minimize the use of raw materials, energy and negative impacts on the environment. This concept refers to ecological and economic performance which both must complement each other, which is realized by reducing the impact on the environment and resource consumption (Czyżewski et al., 2019; Takim et al., 2016; Zheng et al., 2019)

LITERATURE REVIEW

Some previous studies examined the involvement of eco-efficiency with corporate value. The involvement of eco-efficiency as a business strategy has a positive relationship with firm value (Rossi et al., 2013). Companies that implement an eco-efficiency strategy can increase profits and increase the value of the company higher than companies that do not implement an eco-efficiency strategy. In another study of the relationship between eco-efficiency and corporate value to 201 companies in the UK for a period of five years, concluded that eco-efficiency as an environmental policy has a positive effect on market values (Xiong & Gonzalez, 2017). The positive effect of eco efficiency on firm value ultimately has an impact on increasing the value of the company in the future for companies that implement eco-efficiency policies (Heikkurinen et al., 2019; Hirose & Mishima, 2019; Silva et al., 2019).

Profitability is another factor that can affect company value in addition to eco-efficiency (Kyissima et al., 2019). Profitability is the net result of a series of policies and decisions that can be set by measuring the financial ratios as one of the analyzes in analyzing the financial condition and profitability of a company (Al-Najjar & Hussainey, 2011). Profitability is measured by ROA, ie by dividing profits by total assets and good profitability will increase the value of the company (Schellhorn & Sharma, 2013). Research examining the effect of profitability on firm value results in the conclusion that profitability has a positive effect on firm value (Alcocer et al., 2019; Cheng et al., 2019; Zheng et al., 2019). The better the level of profitability of the company shows better performance so that it will increase the value of the company. In addition, evidence is found that profitability can be used as a moderating variable indicating that there is a positive influence of eco-efficiency and profitability interactions on firm value. Companies that implement efficiency policies will have better profitability values and ultimately increase company value (Augusta et al., 2017). Another factor that can affect a company's value is leverage. Leverage is a ratio that measures how much a company uses funding from debt (Farooq, 2015). Increasing and decreasing debt has an influence on market valuations (Schellhorn & Sharma, 2013). The use of high debt will have a negative impact on the value of the company (Prasetyo Supadi & Amin, 2017). With high leverage indicating that the company is not solvable, which shows negative perceptions for investors, the company's value

decreases (Chen & Li, 2019). However, in other studies found a positive effect between leverage on firm value and optimal debt use can increase firm value (Bruhn et al., 2019; Li et al., 2008; Schnabel, 2011; State, 2015).

Greater leverage on companies will encourage company management to initiate policies to change future earnings into the present, thereby increasing the value of the company (Wong & Wong, 2011). According to (El-Sayed Ebaid, 2009) in his research stated that there is a moderate role of negative leverage on the relationship of environmental policy and firm value. Earnings per share (EPS) is the ability to create profit for each share of the company. EPS or earnings per share shows the comparison between the company's net income that is ready to be distributed to shareholders with the number of shares outstanding (Sephton, 2012). Then it can be concluded that the earning per share can be measured by dividing net income by the number of shares outstanding (Hussin et al., 2013). The high EPS value will be beneficial for shareholders because of the large profits available to shareholders.

Book value per share basically represents the assets / equity owned by the company. Book value per share can be measured by dividing total equity by the number of shares outstanding (Alexander et al., 2018). The book value per share indicates that if the security of a company's net assets is getting higher, investors will be willing to pay a higher share price. So investors can estimate the level of investment to be made by the company (Bradford et al., 2017; Takim et al., 2016). Book value per share of the company will continue to increase with increasing company performance (Augusta et al., 2017; Zheng et al., 2019). If the value of book value per share increases, then the company's performance also increases and can increase the price of shares that can make investors interested in investing, then the value of the company will also increase (Erserim, 2012)

METHODOLOGY

This study tries to improve the efficiency, profitability and leverage hypothesis of firm value. The sample used was 81 manufacturing firm listed on BEI and sent in 2014-2018 and using the rupiah. The dependent variable used in this study is the value of the company calculated from the natural logarithm of stock prices at the end of the year. The independent variable is eco-efficiency which is a dummy variable, where the value of 1 is the company implementing ISO 14001 and the value of 0 for companies that do not apply ISO 14001. This study also uses two moderation variables, namely profitability and leverage. The data analysis tool used in this study is multiple linear regression estimated with OLS (Ordinary Least Square). The collected data is then processed and tested using SPSS 22 software.

$$\text{PRICE}_{it} = \beta_0 + \beta_1\text{ECO}_{it} + \beta_2\text{ROA}_{it} + \beta_3\text{LEV}_{it} + \beta_4\text{ECO*PROF}_{it} + \beta_5\text{ECO*LEV}_{it} + \beta_6\text{EPS}_{it} + \beta_3\text{BVE}_{it} + \varepsilon_{it}$$

- PRICE_{it} : market value or price of company equity i in period t
 ECO_{it} : corporate eco-efficiency i in period t
 ROA_{it} : company profitability i in period t
 LEV_{it} : corporate leverage i in period t
 ECO*PROF_{it} : interaction of the eco-efficiency and profitability variables of the company i in the period
 ECO*LEV_{it} : interaction of eco-efficiency variables and firm leverage i in period t
 EPS_{it} : net profit of company i stock in period t
 BVE_{it} : book value per sheet company i in period t
 ε_{it} : error of company equation i in period t

RESULT

From the results of the regression test, it was found that there was a significant positive relationship between eco-efficiency and firm value. This can be interpreted that companies that implement eco-efficiency will increase company value. The results of this study support previous research which found an effect of eco-efficiency on firm value (Osazuwa & Che-ahmad, 2016). The involvement of eco-efficiency as a business strategy has a positive relationship with firm value. This means that it can be proven that companies that apply the concept of eco-efficiency, the value of the company will be higher than companies that do not apply the concept of eco-efficiency (Konstantas et al., 2020). In line with research conducted by (Al-Najjar & Hussainey, 2011) in his research on the relationship between eco-efficiency as an environmental policy and corporate value, the results state that there is a positive relationship between eco-efficiency and market value, and eco-efficiency can increase company profits in the future. Shareholders or investors have an important role in determining the value of the company, because investors who invest in companies that implement eco-efficiency will increase economic value. Regression test results, it was found that leverage does not moderate the relationship between eco-efficiency and firm value and is consistent with the results of previous studies conducted by Osazuwa & Che-Ahmad (2016) which states that there is no leverage effect on the relationship between eco-efficiency and firm value .

Companies that implement eco-efficiency in business strategies will have high company value regardless of debt (State, 2015). The low level of leverage means that the company is able to finance its assets with its own capital, whereas if the high level of leverage reflects the company is still dependent on debt. But that has nothing to do with eco-efficiency and corporate value. Because in his research the contents of eco-efficiency are measured by seeing whether the

company has ISO 14001, where ISO 14001 is about environmental management systems. ISO 14001 can be owned by a company if the company develops an environmental management system according to ISO requirements. In other words, the company will get ISO 14001 if the company continues to develop an environmental management system. So even if the leverage is high or low, the company will continue to apply the concept of eco-efficiency to get ISO 14001 which can increase the value of the company. The results of the regression test found that profitability did not moderate the relationship between eco-efficiency and firm value. This means that a high or low level of profitability does not make the company to implement eco-efficiency to increase the value of the company. The results of this study are not in accordance with research conducted by Osazuwa & Che-Ahmad (2016) which found there is an influence of profitability moderation between the relationship of eco-efficiency and firm value

Table 1
Result Measurement

| Variabel Independen | Koefisien | Prob. |
|----------------------------|------------------|--------------|
| C | 0.130057 | 0.0000 |
| ECO | 0,215 | 0,049 |
| ROA | 4,178 | 0,000 |
| LEV | 6,653 | 0,996 |
| ECO*ROA | -0,416 | 0,528 |
| ECO*LEV | 0,267 | 0,106 |
| Book Value | 4,750 | 0,000 |
| Earning Per Share | -9,642 | 0,394 |
| EKOPROF | | |
| EKOLEV | | |
| Adjusted R ² | 0,2670 | |
| F-Stat | 2,0653 | 0,0000 |

Source: Data processed, 2019

The results of this study are supported by the legitimacy theory stated by (McAdam & Bailie, 2002) that companies will try to operate within the norms that exist in the community or environment where the company is located and ensure that the company's activities are accepted by the environment. In other words, companies must try to get support and trust in the community. Because to get the trust of the community is very important for the survival of the company. So if the company does not get support even though the company's profitability has increased, then sooner or later it will decrease because the environment or the surrounding community greatly affects the production process. It can be concluded that profitability has no influence between the eco-efficiency relationship and company value because with companies implementing eco-efficiency, the company will get support from the community and the environment, the results will increase the company's value in the future

CONCLUSION

Based on the results of research analyzing the effect of eco-efficiency on firm value with profitability and leverage on the manufacturing industry listed on the Indonesia Stock Exchange during the period 2012 to 2016, it can be concluded that there is a significant positive effect between eco-efficiency on firm value on value company. This means that it can be proven that companies that apply the concept of eco-efficiency, the value of the company will be higher than companies that do not apply the concept of eco-efficiency. Leverage does not moderate the eco-efficiency relationship to firm value. Companies that implement eco-efficiency in business strategies will have high company value regardless of debt. The low level of leverage means that the company is able to finance its assets with its own capital, whereas if the high level of leverage reflects the company is still dependent on debt. But that has nothing to do with eco-efficiency and corporate value. Because in his research the contents of eco-efficiency are measured by seeing whether the company has ISO 14001, where ISO 14001 is about Environmental Management Systems. Profitability does not moderate the eco-efficiency relationship to firm value. This means that a high or low level of profitability does not make the company to implement eco-efficiency to increase the value of the company. This research has several limitations and weaknesses so that the results achieved are still far from perfect. The limitations and weaknesses faced are the research periods of only 5 years. This study only examines the relationship of eco-efficiency to firm value and the application of eco-efficiency in manufacturing companies in Indonesia is still small. From the results of research and discussions that have been done, the suggestions that can be recommended for further researchers, namely further research should increase the research year by more than 5 years, for example 10 years.

REFERENCE

- Al-Najjar, B., & Hussainey, K. (2011). Revisiting the capital-structure puzzle: UK evidence. *Journal of Risk Finance*, 12(4), 329–338.
- Alcocer, C. D., Ortegón, J., & Roa, A. (2019). Uncertainty under hyperbolic discounting: the cost of untying your hands. *Journal of Economics, Finance and Administrative Science*, 24(48), 176–193.
- Alexander, A., Kumar, M., & Walker, H. (2018). *A decision theory perspective on complexity in performance measurement and management*.
- Augusta, A., Souza, A., Fernandes, M., Alves, R., & Liboni, L. B. (2017). *Resilience for sustainability as an eco-capability*. 9(5), 581–599.
- Bradford, M., Earp, J. B., Williams, P. F., & Carolina, N. (2017). *Understanding sustainability for socially responsible investing and reporting*. 1(1), 10–35.

- Bruhn, N. C. P., Calegario, C. L. L., & Mendonça, D. (2019). Foreign direct investment in developing economies: A study on the productivity spillover effects in Latin America. *RAUSP Management Journal*, 55(1), 40–54.
- Chaudron, C., Faucher, M., Bazinet, L., & Margni, M. (2019). The cost is not enough - An alternative eco-efficiency approach applied to cranberry de-acidification. *Journal of Cleaner Production*, 232, 391–399.
- Chen, S., & Li, W. (2019). Local government debt and regional economic growth in China. *China Political Economy*, 2(2), 330–353.
- Cheng, B., Liu, S., Xiong, L., Wang, F., Qin, G., Yue, D., Zhang, H., & Yu, C. (2019). Identifying the influencing factors on the quality of China's forestry exports. *Forestry Economics Review*, 1(1), 2–16.
- Czyżewski, B., Smędzik-Ambroży, K., & Mrówczyńska-Kamińska, A. (2020). Impact of environmental policy on eco-efficiency in country districts in Poland: How does the decreasing return to scale change perspectives? *Environmental Impact Assessment Review*, 84(May), 106431.
- Duarte, V., & Sarkar, S. (2011). Separating the wheat from the chaff - a taxonomy of open innovation. In *European Journal of Innovation Management* (Vol. 14, Issue 4, pp. 435–459).
- El-Sayed Ebaid, I. (2009). The impact of capital-structure choice on firm performance: empirical evidence from Egypt. *Journal of Risk Finance*, 10(5), 477–487.
- Erserim, A. (2012). The Impacts of Organizational Culture, Firm's Characteristics and External Environment of Firms on Management Accounting Practices: An Empirical Research on Industrial Firms in Turkey. *Procedia - Social and Behavioral Sciences*, 62(2011), 372–376.
- Farooq, O. (2015). Effect of ownership concentration on capital structure: evidence from the MENA region. *International Journal of Islamic and Middle Eastern Finance and Management*, 8(1), 99–113.
- Gotze, U., Pecas, P., & Richter, F. (2019). Design for eco-efficiency – a system of indicators and their application to the case of moulds for injection moulding. *Procedia Manufacturing*, 33, 304–311.
- Heikkurinen, P., Young, C. W., & Morgan, E. (2019). Business for sustainable change: Extending eco-efficiency and eco-sufficiency strategies to consumers. *Journal of Cleaner Production*, 218, 656–664.
- Hirose, K., & Mishima, N. (2019). Eco-efficiency evaluation of modular design smartphones. *Procedia CIRP*, 84, 1054–1058.
- Hussin, M. Y. M., Muhammad, F., Razak, A. A., Tha, G. P., & Marwan, N. (2013). The Link Between Gold Price, Oil Price and Islamic Stock Market: Experience from Malaysia. *Journal of Studies in Social Sciences*, 4(2), 161–182.
- Konstantas, A., Stamford, L., & Azapagic, A. (2020). A framework for evaluating

- life cycle eco-efficiency and an application in the confectionary and frozen-desserts sectors. *Sustainable Production and Consumption*, 21, 192–203.
- Kyissima, K. H., Xue, G. Z., Yapatake Kossele, T. P., & Abeid, A. R. (2019). Analysis of capital structure stability of listed firms in China. *China Finance Review International*.
- Law, S. H., & Ibrahim, M. H. (2014). The response of sectoral returns to macroeconomic shocks in the Malaysian stock market. In *Malaysian Journal of Economic Studies* (Vol. 51, Issue 2, pp. 183–199).
- Li, D., Eden, L., Hitt, M. A., & Ireland, R. D. (2008). Friends, acquaintances, or strangers? Partner selection in R&D alliances. *Academy of Management Journal*, 51(2), 315–334.
- McAdam, R., & Bailie, B. (2002). Business performance measures and alignment impact on strategy: The role of business improvement models. *International Journal of Operations & Production Management*, 22(9), 972–996.
- Müller, S., & Neubaumer, R. (2018). Size of training firms – the role of firms, luck, and ability in young workers’ careers. *International Journal of Manpower*, 39(5), 658–673.
- Osazuwa, N. P., & Che-ahmad, A. (2016). *The moderating effect of profitability and leverage on the relationship between eco-efficiency and firm value in publicly traded Malaysian firms*.
- Pacheco, L. (2019). Internationalization effects on financial performance: The case of portuguese industrial SMEs. *Journal of Small Business Strategy*, 29(3), 97–116.
- Prasetyo Supadi, D. B., & Amin, M. N. (2017). Pengaruh Faktor Fundamental Dan Risiko Sistematis Terhadap Return Saham Syariah. *Media Riset Akuntansi, Auditing Dan Informasi*, 12(1), 23.
- Rossi, S., Colicchia, C., Cozzolino, A., & Christopher, M. (2013). *The logistics service providers in eco-efficiency innovation: an empirical study*. 6(December 2012), 583–603.
- Schellhorn, C., & Sharma, R. (2013). Using the Rasch model to rank firms by managerial ability. *Managerial Finance*, 39(3), 306–319.
- Schnabel, J. A. (2011). Deriving competitive advantage from real exchange rate changes. *Competitiveness Review*, 21(3), 322–327.
- Sephton, P. (2012). Consumer Spending and Customer Satisfaction: Untying the Knot. *Economics Research International*, 2012, 1–7.
- Silva, F. C., Mackenzie, U. P., Paulo, S., Shibao, F. Y., Julho, U. N. De, Paulo, S., Kruglianskas, I., Paulo, S., Vargas, F. G., Paulo, S., Antonio, P., Sinisgalli, A., Paulo, U. D. S., & Paulo, S. (2019). *Circular economy: analysis of the implementation of practices in the Brazilian network*. 26(1), 39–60.
- Singh, V., Kumar, A., & Singh, T. (2018). Impact of TQM on organisational performance: The case of Indian manufacturing and service industry.

- Operations Research Perspectives*, 5(August 2017), 199–217.
- State, O. (2015). Competitive Strategy and Performance of Selected SMEs in Nigeria. *International Conference on African Development Issues (CU-ICADI) 2105: Social and Economic Models for Development Track*, 326–333.
- Takim, R., Talib, I. F. A., & Nawawi, A. H. (2016). Quality of Life: Psychosocial Environment Factors (PEF) in the Event of Disasters to Private Construction Firms. *Procedia - Social and Behavioral Sciences*, 234, 28–35.
- Wang, X., Ding, H., & Liu, L. (2019). Eco-efficiency measurement of industrial sectors in China: A hybrid super-efficiency DEA analysis. *Journal of Cleaner Production*, 229, 53–64.
- Wong, W. P., & Wong, K. Y. (2011). Supply chain management, knowledge management capability, and their linkages towards firm performance. *Business Process Management Journal*, 17(6), 940–964.
- Xiong, B., & Gonzalez, E. D. R. S. (2017). *Eco-efficiency measurement and improvement of Chinese industry using a new closest target method*.
- Zheng, X., Govindan, K., Deng, Q., & Feng, L. (2019). Effects of design for the environment on firms' production and remanufacturing strategies. *International Journal of Production Economics*, 213(March), 217–228.