Volume. 18 (Special Issue), 2022. Pages 268-277
INOVASI: Jurnal Ekonomi, Keuangan dan Manajemen
ISSN: 0216-7786 (Print) 2528-1097 (Online)

Environmental performance as a mediating variable relationship between green process innovation and eco-efficiency on corporate sustainability of smes in South Sumatera

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Abstract

This paper present determentation of environmental performance as a mediating variable of the relationship between green process innovation and eco-efficiency on the corporate sustainability in small and medium enterprise (SME) in South Sumatra. This study using partial least square structural equation technique in making data analysis. The respondents in this study were the managers and owners of manufacturing small and medium-sized businesses. There were 70 SMEs as research samples. The results showed that green process innovation and eco-efficiency directly had a positive and significant effect on environmental performance, but green process innovation had no impact on corporate sustainability. Eco-efficiency also does not affect corporate sustainability. Meanwhile, the environmental performance has a positive and significant effect on corporate sustainability. For indirect testing, complete mediation environmental performance can influence the relationship between green process innovation and eco-efficiency on corporate sustainability. Therefore, this study suggests that SMEs managers and owners in South Sumatra can continue carrying out green practices to become SME with competitiveness and business sustainability.

Key words: Green process innovation; eco-efficiency; corporate sustainability; environmental performance

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DOI: 10.29264/jinv.v18i0.11261

INTRODUCTION

In recent years, corporate sustainability (CS) has attracted a lot of attention among researchers. Studies assessing and maintaining sustainability have increased worldwide. (Islam et al., 2019). Nowdays, stakeholder demands and institutional influence have prompted companies to incorporate corporate sustainability into their internal policies and strategies (Jan et al., 2021). The are three perspectives measuring the corporate sustainability; economic benefits, reduction of environmental impacts, and social welfare (triple bottom line concept) (Islam et al., 2019; Sari et al., 2020). Furthermore (Dyllick & Hockerts, 2017) states that this term refers to being a sustainable corporation, which is not only consistent with the triple bottom line concept but is also a business orientation that meets stakeholders' needs over the long term. In order to achieve long-term sustainability, businesses will have to manage not only economic capital, but also their natural capital and their social capital.

Corporate sustainability has been defined as a balance between profit, environment, and social without impacting future development (Sari et al., 2020) Meanwhile, Edgement and William (2014) explain corporate sustainability as an organization's capacity to create and maintain economic, environmental, and social value for itself, stakeholders, and society in general both in the short and long term. The implementation of corporate sustainability is not always associated with social responsibility programs that companies in Indonesia mainly carry out. More important is how companies can synergize environmental harmonization and community empowerment activities into their business processes to achieve profits. To support organizations that want to develop their business sustainably, companies must develop a sustainable implementation strategy which is usually part of their business process improvement strategy (Sari et al., 2020).

One of the industries that are encouraged to develop business sustainably is the small and medium enterprise (SMEs) sector. In Asia, SMEs play an essential role in economic growth and the achievement of sustainable development goals. SMEs are the key to job creation and income distribution, as well as export growth (Lopes de Sousa Jabbour et al., 2020). For example, in Indonesia, SMEs contributed to the Gross Domestic Product by 61.07%, with a total investment of 60.42%. However, SMEs in the manufacturing sector are also responsible for most of the world's resource consumption, air and water pollution, and waste generation (Lopes de Sousa Jabbour et al., 2020). Moreover, from their production activities, SMEs can influence the environmental impact of large-scale companies, 60-70% of the total pollution produced by SMEs (Hoogendoorn et al., 2015). Therefore, SMEs become objects that are pretty important to be investigated by raising the issue of whether owners and managers of SMEs know how environmentally-based and environmentally friendly business concepts can improve corporate sustainability.

Through an environmentally-based business concept, managers and owners can pay more attention to environmental impacts and to face increasing pressure from the community and government. Therefore, companies must be greener or more environmentally friendly (Gadenne et al., 2009). In addition, the shift in consumer behavior that starts looking for environmentally friendly products emphasizes the importance of environmentally friendly business concepts. For SMEs in Indonesia, especially in Palembang, this awareness must be created and developed. From the results of previous research, business concepts with environmental concepts significantly impact market competitiveness (M. Wang et al., 2021). For this reason, SMEs can prioritize Eco-efficiency and green process innovation as a strategy for improving their business processes. Besides increasing company profits and sustainability, the eco efficiency and the green innovation variable can also become environmentally friendly SMEs that meet the expectations of local community stakeholders.

Based on the explanation above, this study aims to confirm previous research related to green process innovation, eco-efficiency on corporate sustainability with environmental performance as a mediating variable in SMEs in South Sumatera, and to present findings and evidence-based on SMEs to aid in grasping the wide range of benefits that can accrue to firms that adopt green process innovation and eco-efficiency practices. Furthermore, provide local government input to support SMEs through coaching programs.

Literature Review

Stakeholder Theory

Freeman's (1984) defining a stakeholder is an individual or a group of individuals who can influence the organization in achieving organizational goals. These groups or individuals include employees, communities, local governments, customers, even suppliers, competitors, etc. Currently, the Company's primary goal is not only to gain profit or profit, but the Company strives to maintain business continuity in the future without disturbing the ability of future generations to meet their needs.

Although industrialization and globalization present essential advantages for companies and countries, their negative impact on the environment has attracted significant attention from various stakeholder groups, governments, international bodies, and others. Thus, achieving environmental sustainability is no longer an option but is mandatory for companies (Baah et al., 2021). Based on this, the Company needs good management and strategies in carrying out its operational activities to maintain good relations with all stakeholders to generate positive responses from all stakeholders.

Green Process Innovation

Green process innovation improves existing production processes or adds new production processes to reduce environmental impacts and production costs (Sezen & Çankaya, 2013). An important goal of green process innovation is to improve economic performance and an environmental management strategy (Liu & Zhang, 2021; Tang et al., 2018; Y. Wang et al., 2019)

Eco-Efficiency

Eco-efficiency is a strategy company to achieve sustainable development through economic savings and reducing environmental impacts (Vásquez et al., 2019). The term eco-efficiency is known as the desire of entrepreneurs to improve products starting from the green process to providing environmentally friendly services (Vásquez et al., 2018). Eco-efficiency aims to offer more value for the product while reducing the existing environmental impact (Lay & Panjaitan, 2014). Eco-efficiency is a concept that encourages companies to improve environmental performance or at least equivalent to economic performance (Putri & Sari, 2019). Furthermore (Pang et al., 2016) states that eco-efficiency is a tool to analyze sustainability that shows how to carry out economic activities effectively. From some of the definitions that mention before eco-efficiency is a strategy that refers to the company's ability to produce more goods and services with less impact on the environment and more efficiency in the use of natural resources and can create added value products so that eco-efficiency can bring together economic and ecological issues.

Environmental Performance

Environmental performance is the performance of a company that cares about the surrounding environment. PROPER is one of the efforts made by the Ministry of Environment (KLH) to encourage company compliance in environmental management through information instruments. So, companies are encouraged to carry out surveillance and monitoring for further supervision. The results of the control are announced in the media mass and given rewards and sanctions (Rahmawati, 2012)

Corporate Sustainability

Corporate sustainability is an effort to meet the interests of the company's stakeholders, either directly or indirectly, such as shareholders, employees, clients, communities, and others, without compromising its ability to meet the needs of stakeholders in the future (Dyllick & Hockerts, 2017). Corporations have become more sensitive to social, environmental, and economic issues and stakeholder concerns and are striving to become better corporate citizens. Whether the motivation is concern for society and the environment, government regulation, stakeholder pressures, or economic profit, the result is that managers must make significant changes to more effectively manage their social, economic, and environmental Impacts. Corporate sustainability is a principle that applies a balance between economic factors (profits), environmental factors (planet), and social factors (humans) or what is known as the triple bottom line. Through this concept, companies must be more responsible in managing their business without demage future development. The most important thing is that the emphasis is no longer on whether organizations should consider sustainability issues and their consequences but on how organizations can integrate environmental, social, and economic responsibilities into day-to-day decision making (Epstein & Buhovac, 2014).

The hypotheses development

Relationships between Green process innovation and environmental performance

In some previous studies (Tang et al., 2018; M. Wang et al., 2021) revealed the green process innovation could improve environmental and economic performance. In others study results (Cheng et al., 2014; Sezen & Çankaya, 2013; Xie et al., 2019) indicated that the green process innovation positively impacts the company's competitive advantage and sustainability. And the results of the study (Baah et al., 2021) that the green process practices are significantly and positively affect the company's reputation and environmental performance in SMEs.

H1: Green process innovation has a positive effect on environmental performance

Relationships between Eco Efficiency and environmental performance

Eco-Efficiency is a concept of resource efficiency by reducing the resources used to produce and creating added value for the product without increasing the number of resources needed. Some previous studies indicate that eco-efficiency provides an excellent opportunity for companies to achieve environmental performance, and eco-efficiency has a significant effect on company performance., (Putri & Sari, 2019).

H2: Eco Efficiency has a positive effect on environmental performance

Relationships between Green Process Innovation and corporate sustainability

Study on the relationship of green process innovation to corporate sustainability is still little (Sezen & Çankaya, 2013). However, there has been increasing attention to the innovation process for sustainable development in the last two decades. The study results (Sezen & Çankaya, 2013) revealed that green process innovation positively affects corporate sustainability performance. Meanwhile, the study results (Abbas & Sağsan, 2019) show that green process innovation as measured by knowledge management has a positive relationship to corporate sustainability development.

H3: Green Process Innovation has a positive effect on corporate sustainability

Relationships between Eco Efficiency and corporate sustainability

Eco-efficiency refers to the company's ability to produce more goods and services with less impact on the environment and requires less use of natural resources so that eco-efficiency can bring together economic, ecological, and social issues. Through Eco-efficiency, companies can produce products or services that meet consumer expectations at competitive prices while trying to reduce the negative impact on the environment. By applying the concept of eco-efficiency, which reduces the resources used in production and simultaneously can create added value for the product without increasing the number of resources used and ultimately realizing corporate sustainability. Several previous studies have stated that eco-efficiency can help sustainable development by integrating business activities, regardless of company size or economic situation (Vásquez et al., 2018). And the result of the research (Meutia et al., 2019) revealed that the environmental performance as measured by the eco-efficiency has a significant positive effect on the financial performance of the companies

H4: Eco Efficiency has a positive effect on corporate sustainability

Relationships between Environmental performance and corporate sustainability

Environmental performance management aims to fulfil all laws and regulations, and environmental requirements in a thorough manner. This activity can reduce the quality of ecological impacts to below the quality standards required by related regulations (Tjahjono, 2013). Furthermore (Zhang & Wei, 2021) stated that in terms of environmental performance as organizational effectiveness, SMEs leaders could play an essential role in implementing environmental strategies to achieve environmental performance. SMEs stakeholders, such as employees, competitors, customers, suppliers, local communities, and public authorities, expect companies to achieve environmental and financial performance (Hoogendoorn et al., 2015). Meeting the expectations of local community stakeholders is significant for the competitiveness of SMEs because SMEs are more dependent on local communities and require closer interaction and more business activities than large companies (Gadenne et al., 2009). Stakeholder-focused environmental compliance and crisis mitigation can be the key to the survival of SMEs (Zhang & Wei, 2021)

H5: Environmental performance has a positive effect on corporate sustainability

Relationships between Environmental performance as a mediating variable on green process innovation, eco efficiency and corporate sustainability

Previous research revealed (Tang et al., 2018; M. Wang et al., 2021) that the green process innovation can improve environmental and economic performance. Based on past studies (Cheng et al., 2014; Sezen & Çankaya, 2013; Xie et al., 2019) also revealed that green process innovation positively impacts the company's competitive advantage and sustainability. And the results of the research (Baah et al., 2021) revealed that the green process has relation significant and positive effect on the company's reputation and environmental performance in SMEs. The research results (Putri & Sari, 2019) stated that eco-efficiency provides an excellent opportunity for companies to achieve environmental performance.

H6: Green process innovation has a positive and significant effect on corporate sustainability with environmental performance as a mediating variable.

H7: Eco efficiency has a positive and significant effect on corporate sustainability with environmental performance as a mediating variable.

METHOD

South Sumatra province is known as one of the rich provinces in natural resources. In 2020, the number of companies in the large and medium categories in South Sumatera Province was 105 food industry. Compared to districts/cities in South Sumatera, Palembang City has the highest number of companies in large and medium enterprises, as many as 70 units. Beside that number of micro and small enterprise categories in South Sumatra Province in 2019 was dominated by the food industry with 25,795 units.

The study employed a quantitative approach and the data used in this study is primary data, namely the respondent's answers to the questions on the research questionnaire. The questionnaires were sent by email to the owners and managers of manufacturing SMEs in South. From the results of sending the questionnaire online, there are 70 respondents answer. The sampling technique was carried out by non-probability sampling (not randomly) with the criteria of SMEs as respondents based on the number of employees and the number of assets owned. The scale used in the questionnaire preparation is the Linkert scale, where the measured research variables as measured in the form of question items with a 5-point assessment (from strongly disagree (=1) to absoltely agree (=5)). The questions posed in this questionnaire are modified questions from previous researchers.

The measurement model used is Variance Based Structural Equation Modeling (VB-SEM) using smartPLS3 through construct reliability and validity, discriminant validity, and outer loading. The model used aims to test the construct relationship for further analysis. Furthermore, measurement of the structural model analysis, namely, R square, path coefficients, and bootstrapping, tests the research hypothesis.

This study has three types of variables: the independent variable, the dependent variable, and the mediating variable, which are green process innovation and eco-efficiency. The dependent variable is corporate sustainability, and a mediating variable in this study is environmental performance. The question items are modifications from previous research (Lopes de Sousa Jabbour et al., 2020; Vásquez et al., 2018; M. Wang et al., 2021).

RESULT AND DISCUSSION

Measurement Model

Outer Loading

A loading factor value of 0.70 or more means has a strong enough validation to explain the latent construct. From the results of testing the data, the value of the question items for each variable has resulted in a value above 0.70 which means it is acceptable and has validity. The value of outer loading show in Table 1.

Table 1.
Outer Loading

Item	Green Process Innovation	Eco Efficiency	Corporate Sustainability	Environmental Performance
X1.1	0,753			
X1.2	0,820			
X1.3	0,799			
X1.4	0,869			
X2.1		0,969		
X2.2		0,970		
Y1.1			0.901	
Y1.2			0,841	
Y1.3			0,878	
M1.1				0,840
M1.2				0,897
M1.3				0,895

Reliability and Validity Test

A measurement model requires an assessment that aims to see whether or not there is a relationship between the latent variable and the indicator. In this research, the first uses measurements of composite reliability and Cronbach's alpha. If the value of Composite reliability and the Cronbach's is between 0.60 - 0.90, it is mean accepted. The second is using convergent validity. The convergent validity value is received when the average variance extracted (AVE) value is above 5.50 (Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, 2017). The results are show in the table 2.

Table 2.
Construct Reliability dan Validity

	Cronbach's Alpha	Rho_A	Composite Reliability	Average Variance Extracted (AVE)
Green Process Innovation	0,828	0,869	0,906	0,763
Eco Efficiency	0,937	0,937	0,969	0,941
Corporate Sustainability	0,846	0,842	0,885	0,659
Environmental Performance	0,851	0,859	0,910	0,771

The measurement of latent variables and indicators for measuring Cronbach's alpha and composite reliability of green process innovation are 0.828 and 0.906, eco-efficiency is 0.937 and 0.969, corporate sustainability is 0.846 and 0.885, and environmental performance is 0.851 and 0.910. For the average variance extracted (AVE) from green process innovation is 0.763, eco-efficiency is 0.941, corporate sustainability is 0.659, and environmental performance is 0.771, From the results of the variables, its mean received

Discriminant Correlation Test

The discriminant correlation test o see the correlation between the constructs and other constructs. If the value of the square root of the AVE for each construct is greater than the correlation value between the construct and other constructs in the model. This means the construct has a good level of validity

Table 3.
Discriminant Validity

	Corporate Sustainability	Eco Efficiency	Green Process Innovation	Environmental Performance
Corporate Sustainability	0,874			
Eco efficiency	0,490	0,970		
Green Process Innovation	0,553	0,426	0,812	
Environmental Performance	0,717	0,642	0,622	0,878

Model Structural

The structural model analysis can see from R-Square (R^2). The value of R^2 can show that exogenous variables can measure and explain exogenous variables. In general, the value of R2 for endogenous variables there are three categories of values, namely 0.75 means strong, 0.50 is medium,

and 0.25 is weak (Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, 2017). The estimated R-square values are shown in the table 4.

Table 4.
Nilai R-square

	R Square	R Square Adjusted
Corporate Sustainability	0,534	0,513
Environmental Performance	0,561	0,548

The R-square value of the corporate sustainability variable is 0.534 or 53.4%. Its means, the green process innovation variable, and the eco-efficiency variable can explain the corporate sustainability variable in the amount of 53,4%. While the R-Square of the environmental performance variable is 0,561 or 56.1%. Its means environmental performance variable, the green process innovation variable, and the eco-efficiency variable can explain environmental performance in the amount of 56,1%.

Direct and Indirect Analysis

Direct Analysis

Based on testing using the Bootstrapping function, if the p-value is below 0.05 or the T-statistic value is above 1.96, it means that the hypothesis is accepted. Thus, from the bootstrapping process, the path coefficients are in table 5.

Table 5.
Path Coefficients

H	Variable / Construct	Original Sample	Sample Mean	Standard Deviation (STDEV)	T-Statistic (O/STDEV)	P - Values	Result
H1	Green Process Innovation → environmental performance	0,427	0,446	0,113	3,760	0,000	Accepted
H2	Eco Efficiency → environmental performance	0,460	0,447	0,103	4,481	0,000	Accepted
H3	Green Process Innovation → Corporate Sustainability	0,172	0,208	0,133	1,294	0,196	Rejected
H4	Eco Efficiency → Corporate Sustainability	0,043	0,029	0,140	0,306	0,760	Rejected
H5	Environmental Performance → Corporate Sustainability	0,582	0,563	0,138	4,206	0,000	Accepted

Based on table 5, the hypothesis 1 (H1) has T-Statistic is 3,760 and the p-value is 0.01, it's means that (H1) is accepted, because T-statistic more than 1,96 and p value less than 0.05. Green process innovation has effect on environmental performance. The second hypothesis has the t-statistic is 4,481 and p value is 0,000, which reveal H2 is accepted. Eco efficiency has effect on environmental performance. The third hypothesis has the t-statistic is 1,294 les than 1,96 and the p value is 0,196 more than 0,005, this means H3 is rejected. The green innovation process does not have effect on corporate sustainability. The fourth hypothesis has the t-statistic is 0,306 and the p value is 0,760. The fourth hypothesis is rejected. The eco efficiency does not have effect on corporate sustainability. The fifth hypothesis has the t-statistic is 4,206 more than 1,96 and the p value is 0,000, which reveal that the fifth is accepted. The environmental performance has effect on corporate sustainability.

Indirect Analysis (Mediation)

The result of indirect analysis are shown in the table 6

Table 6.
Specific Indirect Effects

	Variable / Construct	Original Sampel	Sampel Mean	Standard Deviation (STDEV)	T Statistict (O/STDEV)	P - Values	Result
H6	Green Process Innovation → Environmental performance → Corporate Sustainability	0,268	0,255	0,093	2,877	0,004	Accepted
H7	Eco Efficiency → Environmental performance → Corporate Sustainability	0,248	0,248	0,080	3,100	0,002	Accepted

Based on the table 7, the sixth hypothesis (H6) has t statistic is 2,877 more than 1,96 and the p value is less than 0,05 it's means H6 is accepted. The green process innovation has effect on corporate sustainability through environmental performance as a mediating variable that gives full mediation results, which reveal that without environmental performance, green process innovation is not able to effect corporate sustainability. The seventh hypothesis has the t-statistic 3,100 and the p value is 0,002 less than 0,05. The seventh hypothesis is accepted. The eco-efficiency has effect on corporate sustainability through environmental performance as a mediating variable that gives full mediation results, this means without a mediating variable, namely environmental performance, eco-efficiency is not able to influence corporate sustainability.

These findings indicate that stakeholder theory supports this research. Creating or increasing company value is not only concerned with profit, but it is necessary to pay attention to stakeholders for their needs in a healthy environment, and company operations must be in line with communities expectations. Eco-efficiency and green innovation has a positive effect on environmental performance. SMEs managers and owners realize the importance of an environmentally-based business concept. Support from local communities, consumers, suppliers, and the government is significant for the sustainable of SMEs.

CONCLUSIONS

Corporate Sustainability of SMEs in South Sumatra has no relation with green process innovation. Green process innovation only affected on environmental performance. This situation happen because SMEs in South Sumatra have not implemented the concept of green innovation as a whole, there are still many parts of the production process that use traditional technology. One of the reasons is that SMEs are still not given a good education and understanding of the benefits of green technology for SME business sustainability. SMEs also need the participation of all parties, both internal and external to implement the Green Process Innovation and Eco-Efficiency. In addition, SMEs that have an environment-based business concept will affect the success of large-scale companies. However, this study has limitations, including too few respondents and the indicator questions are few. And for further researchers to be able to expand the number of respondents by adding question indicators that are directly related to business processes.

REFERENCES

Abbas, J., & Sağsan, M. (2019). Impact of knowledge management practices on green innovation and corporate sustainable development: A structural analysis. Journal of Cleaner Production, 229, 611–620. https://doi.org/10.1016/j.jclepro.2019.05.024

Baah, C., Opoku-Agyeman, D., Acquah, I. S. K., Agyabeng-Mensah, Y., Afum, E., Faibil, D., & Abdoulaye, F. A. M. (2021). Examining the correlations between stakeholder pressures, green production practices, firm reputation, environmental and financial performance: Evidence from manufacturing SMEs. Sustainable Production and Consumption, 27, 100–114. https://doi.org/10.1016/j.spc.2020.10.015

Cheng, C. C. J., Yang, C. L., & Sheu, C. (2014). The link between eco-innovation and business performance: A Taiwanese industry context. Journal of Cleaner Production, 64, 81–90. https://doi.org/10.1016/j.jclepro.2013.09.050

Dyllick, T., & Hockerts, K. (2017). Beyond the business case for corporate sustainability. Corporate Environmental Responsibility, 141, 213–224. https://doi.org/10.4324/9781315259277-7

Epstein, M. J., & Buhovac, A. R. (2014). Best Practices in Managing and Measuring Corporate Social, Environmental, and Economic Impacts. In Making Sustainability Work Best Practices in Managing and Measuring Corporate Social, Environmental, and Economic Impacts. http://www.bkconnection.com/static/Making_Sustainability_Work_2nd_EXCERPT.pdf

Gadenne, D. L., Kennedy, J., & McKeiver, C. (2009). An empirical study of environmental awareness and practices in SMEs. Journal of Business Ethics, 84(1), 45–63. https://doi.org/10.1007/s10551-008-9672-9

Hoogendoorn, B., Guerra, D., & van der Zwan, P. (2015). What drives environmental practices of SMEs? Small Business Economics, 44(4), 759–781. https://doi.org/10.1007/s11187-014-9618-9

Islam, M. S., Tseng, M. L., & Karia, N. (2019). Assessment of corporate culture in sustainability performance using a hierarchical framework and interdependence relations. Journal of Cleaner Production, 217(April), 676–690. https://doi.org/10.1016/j.jclepro.2019.01.259

Jan, A. A., Lai, F. W., & Tahir, M. (2021). Developing an Islamic Corporate Governance framework to examine sustainability performance in Islamic Banks and Financial Institutions. Journal of Cleaner Production, 315(June), 128099. https://doi.org/10.1016/j.jclepro.2021.128099

Lay, W. S., & Panjaitan, T. W. S. (2014). Menghitung Eco-efficiency di PT. APIE Indo Karunia. Jurnal Titra, 2(2), 155–160.

Liu, C., & Zhang, Y. (2021). Religiosity and political connections of private firms in China. Emerging Markets Finance and Trade. https://doi.org/10.1080/1540496X.2019.1598366

Lopes de Sousa Jabbour, A. B., Ndubisi, N. O., & Roman Pais Seles, B. M. (2020). Sustainable development in Asian manufacturing SMEs: Progress and directions. International Journal of Production Economics, 225(July 2019), 107567. https://doi.org/10.1016/j.ijpe.2019.107567

Meutia, I., Ramadhani, M., & Adam, M. (2019). Does Eco-Efficiency Improve Financial Performance of Manufacturing Companies in Indonesia? Jurnal Dinamika Akuntansi Dan Bisnis, 6(2), 137–150. https://doi.org/10.24815/jdab.v6i2.13785

Pang, J., Chen, X., Zhang, Z., & Li, H. (2016). Measuring eco-efficiency of agriculture in China. Sustainability (Switzerland), 8(4). https://doi.org/10.3390/su8040398

Putri, W. H., & Sari, N. Y. (2019). Eco-efficiency and eco-innovation: Strategy to improve sustainable environmental performance. IOP Conference Series: Earth and Environmental Science, 245(1). https://doi.org/10.1088/1755-1315/245/1/012049

Sari, Y., Hidayatno, A., Suzianti, A., Hartono, M., & Susanto, H. (2020). A corporate sustainability maturity model for readiness assessment: a three-step development strategy. International Journal

of Productivity and Performance Management, 70(5), 1162–1186. https://doi.org/10.1108/IJPPM-10-2019-0481

Sezen, B., & Çankaya, S. Y. (2013). Effects of Green Manufacturing and Eco-innovation on Sustainability Performance. Procedia - Social and Behavioral Sciences, 99, 154–163. https://doi.org/10.1016/j.sbspro.2013.10.481

Tang, M., Walsh, G., Lerner, D., Fitza, M. A., & Li, Q. (2018). Green Innovation, Managerial Concern and Firm Performance: An Empirical Study. Business Strategy and the Environment, 27(1), 39–51. https://doi.org/10.1002/bse.1981

Tjahjono, M. S. (2013). Pengaruh kinerja lingkungan terhadap nilai perusahaan dan kinerja keuangan. Jurnal Ekonomi Universitas Esa Unggul, 4(1), 17905.

Vásquez, J., Aguirre, S., Fuquene-Retamoso, C. E., Bruno, G., Priarone, P. C., & Settineri, L. (2019). A conceptual framework for the eco-efficiency assessment of small- and medium-sized enterprises. Journal of Cleaner Production, 237. https://doi.org/10.1016/j.jclepro.2019.117660

Vásquez, J., Bruno, G., Settineri, L., & Aguirre, S. (2018). Conceptual Framework for Evaluating the Environmental Awareness and Eco-efficiency of SMEs. Procedia CIRP, 78, 347–352. https://doi.org/10.1016/j.procir.2018.09.062

Wang, M., Li, Y., Li, J., & Wang, Z. (2021). Green process innovation, green product innovation and its economic performance improvement paths: A survey and structural model. Journal of Environmental Management, 297(June), 113282. https://doi.org/10.1016/j.jenvman.2021.113282

Wang, Y., Wang, X., Chang, S., & Kang, Y. (2019). Product innovation and process innovation in a dynamic Stackelberg game. Computers and Industrial Engineering, 130(September 2018), 395–403. https://doi.org/10.1016/j.cie.2019.02.042

Xie, X., Huo, J., & Zou, H. (2019). Green process innovation, green product innovation, and corporate financial performance: A content analysis method. Journal of Business Research, 101(June 2018), 697–706. https://doi.org/10.1016/j.jbusres.2019.01.010

Zhang, Y., & Wei, F. (2021). SMEs' charismatic leadership, product life cycle, environmental performance, and financial performance: A mediated moderation model. Journal of Cleaner Production, 306(April), 127147. https://doi.org/10.1016/j.jclepro.2021.127147