The Effect of Green Innovation and Green Accounting on Company Performance in 2020-2021

Pasca Dwi Putra[1], Khairunnisa Harahap[2], Ivo Selvia Agusti[3], Andri Zainal[4]

{sgacenter@gmail.com[1], nisaharahap@yahoo.com[2], unimedivo@yahoo.co.id[3], andrizainal@unimed.ac.id }

Department of Business Education, Faculty of Economics, Universitas Negeri Medan, Indonesia 20221[1]

Department of Accounting, Faculty of Economics, Universitas Negeri Medan, Indonesia 20221[2]

Department of Business Education, Faculty of Economics, Universitas Negeri Medan, Indonesia 20221[3]

Department of Accounting Education, Faculty of Economics, Universitas Negeri Medan, Indonesia 20221[4]

Abstract. Competing to improve performance causes environmental damage. The company ignores the negative impact of its operational activities. As a result, society and the environment are affected. The purpose of this study is to determine the importance of corporate concern for the environment through the implementation of green innovation and green accounting on the performance of manufacturing companies. The research was conducted on manufacturing companies listed on the Indonesia Stock Exchange during 220-2021. Hypothesis testing using multiple linear regression. The total number of observations was 304. The results showed that green innovation has a significant effect on the impact of green accounting and firm performance. However, the implementation of green accounting in financial reporting has an insignificant effect on firm performance. Therefore, it can be concluded that the existence of green innovation in the production process will improve firm performance and the application of green accounting.

Keywords: Green innovation, green accounting, firm performance, Indonesia Stock Exchange.

1 Introduction

Climate change and environmental degradation are now a concern for many people. This is because it has an impact on activities to health. One of the factors causing this is the pollution produced by manufacturing companies to produce goods that aim to fulfil the needs of consumers. Companies are required to be able to increase productivity which ultimately increases the amount of sales and net profit of the company. But on the other hand, increasing

ICIESC 2023, October 24, Medan, Indonesia

DOI 10.4108/eai.24-10-2023.2342050

productivity will have a negative impact on the environment such as air pollution, waste, and excessive exploitation of natural resources. Therefore, it is important for companies to find the right strategy that can increase net profit without damaging the environment.

The rapid development of technology now provides an opportunity for consumers to be able to obtain goods cheaply. In addition, the high demand for goods causes stakeholders to force companies to increase their productivity by promising large compensation. As a result, environmental damage so that sustainable development will be threatened [1]. Therefore, the company must determine a better plan in improving its performance.

One of the measurements of company performance is through the measurement of return on assets and return on equity. This measurement looks at how the contribution of assets and equity in generating net income for the company. The majority of investors will measure company performance through the utilization of assets and equity owned by the company in generating profits. The environment also includes the company's assets so that it becomes an indicator in measuring whether the company is able to utilize the environment without damaging it. Many factors affect company performance. If previous studies have measured company performance through liquidity and solvency ratios. But these ratios only pay attention to the internal side of the company without paying attention to the negative impact produced on the environment. Nowadays, environmental issues play an important role in product selection. The existence of natural disasters such as floods, or prolonged drought is an important concern for everyone. This is due to the increase in the earth's temperature evenly due to forest burning and pollution generated from both companies and motorized vehicles. As a result, some areas experience flooding due to the continuous rainy season and the absence of trees and others experience drought due to prolonged drought. As a result, developed and developing countries have begun to pay attention to these issues by creating policies and regulations that restrict the operations of companies that have a negative impact on the environment. One of these is to reduce the use of plastics or the processing of waste that has a negative impact on the environment. This is known as green innovation and green accounting.

Green innovation is the concept of using environmentally friendly technology in the production process. It aims to provide companies with facilities related to environmentally friendly production processes so that sustainable development can be achieved [2]. The concept of green innovation arises due to the many environmental problems caused by the activities of companies, so the government and society as consumers need new innovations that have a positive impact on the environment [3]. In addition, the awareness of buying products that do not harm the environment is an important basis for the emergence of green innovations and creates new market opportunities. In addition, strict industry regulations encourage firms to produce green innovations in order to reduce reputational risks and sanctions [4]. Furthermore, the use of green innovations is a hot topic in the industry today, which has a positive impact in the form of cost reduction and increased revenue, where many consumers buy environmentally friendly goods and competitiveness between firms [5]. Research conducted [6] shows the importance of companies in adopting green innovation where it will have a positive impact on the overall quality of life and is very profitable [7]. However, research conducted by [8] shows that companies that adopt the concept of green innovation do not experience improved financial performance. This finding is also supported by [9] that green innovation makes only a small contribution to the company's green portfolio.

Another factor influencing corporate performance is green accounting. This concept shows the company's responsibility in charging the cost of environmental damage to the production process and product costs. Green accounting shows the incorporation of accounts in general with explicit recognition in the financial accounting system [10,11] for the contribution of the environment to human welfare [12], where the company will charge the environmental costs resulting from the production process of goods used by consumers. In addition, green accounting has emerged as an answer to provide financial and quality information on the environmental aspects of the company [13]. The results of the research [14] show that the calculation of environmental costs will help to support the sustainability of the company and to plan the right capital, where the company still maintains the availability of capital in financing operations, but on the other hand the company is not disturbed by the costs of preserving the environment. Many companies today have started to apply green accounting in their financial systems. For example, research conducted by [13] shows that 80% of mining companies in Colombia have implemented green accounting in their financial statements. Accounting for environmental costs in the company's financial system will have an impact on reducing the burden on the company, which in turn will improve the company's performance. This will be supported by consumers, who will give preference to companies that produce goods with the environment in mind. ultimately, companies that use green accounting in their financial reporting will have a positive effect on company performance.

This paper discusses the background and builds on the hypotheses discussed in the first session. While the second session discusses the theory related to this research. The third session explains the use of research methods using the structural equation model (SEM) and data sources. The next session explains the findings and discussion of this research. The last session explains the conclusions which include the implications of this research and references.

2. Literature Review

Firm Performance

There are 2 objectives in setting up a company, short term and long term. The short term goal of the company is to maximize the profit of the company while the long term goal of the company is to prosper the owners of the company, in this case the investors. In order to achieve these goals, the company is required to develop the right strategy so that the sustainability of the company can run continuously. According to [15] there are three categories of corporate sustainability namely environmental, social and economic sustainability. Environmental sustainability focuses on the natural environment and resources. While social sustainability refers to the social and surrounding people and economic sustainability refers to the economic and financial aspects of the company [16]. Ultimately, with the implications of sustainable development, companies can increase their profitability for the better. The rapid development of technology, but not accompanied by policies to protect the environment, causes environmental degradation, so the importance of the role of society and government in monitoring and pushing companies through regulations and protocols to develop strategies and innovations to preserve the environment [17]. Today, there are many strategies that companies can use to increase revenue while being environmentally sustainable. Strategies include reducing the use of packaging that has a negative impact on the environment, using recycled and biodegradable materials, and adding the cost of maintaining the environment to the cost of sales. We see this strategy having a positive impact where many consumers prefer products that have a positive impact on the environment. Environmental performance can have a significant impact on the financial performance of the company [18], which if not a concern of the company, will affect the sustainability of the company [19]. Therefore, through new innovations, both strategies, processes and products are expected to improve firm performance.

Green Innovation

Green innovation is a hot topic today, not just in one region, but around the world. This is because many operating companies have a negative impact on the environment in the form of traffic congestion, carbon dioxide emissions, packaging materials that do not decompose in a short period of time, the use of toxic materials, and pollutants generated in the production process [20–22]. Therefore, many countries have adopted policies to limit production processes that have an impact on the environment. As for overcoming these problems by producing a new innovation called green innovation. Green innovation is a form of contemporary innovation due to the awareness of sustainability and has a positive impact on the performance of companies [5]. According to [2], green innovation is a concept that aims to facilitate companies to produce environmentally friendly products so that sustainable development can be achieved. This is supported by [3] that green innovation is one of the strategies to achieve sustainable development in the manufacturing industry that reduces damage to the environment. In implementing the green innovation strategy, there are two main focuses, namely green technology innovation and green management innovation [23,24].Green technology innovation aims to combine green knowledge with technology [25], while green management innovation aims to restructure a new management system that improves the production process without having a negative impact on the environment [23]. In addition, green innovation includes innovation in new processes, tools, systems and products that add value to the company, which aims to reduce the negative impact on the environment [26–28]. Through green innovation, it is expected that the world's concerns about processes, systems or methods and products that have a detrimental impact on the environment will be resolved, so that ultimately the company will improve its performance by increasing the amount of revenue. Finally, green innovation also helps to improve the quality and performance of the company in terms of efficiency [7] and company sales [29].

Green Accounting

Today's environmental problems are the responsibility of many parties, including companies. Companies, in carrying out their activities, have negative impacts such as over-exploitation of resources, destruction of forests, generation of pollution and other negative effects on the environment. As a result, we are now experiencing many natural disasters such as flooding, reduced soil fertility and pollution. As a result, the government makes policies and regulations that require companies to take responsibility for improving the environment and preventing further environmental damage. In this case, the company that develops this strategy is the accounting party by making corporate financial planning based on the environment, which is called green accounting. Green accounting aims to provide information on the impact of the company's operations on the environment and its impact on the company's continuation [13]. This is also clarified by going through this system regulates everything accounting system in developing and clarifying the environment that aims to prevent and protect, environmental liabilities, environmental income and costs. Ultimately, through the implications of green accounting, it is expected to support government policies and can be integrated with environmental data in the company's general accounting system [10,11]. Environmental accounting is also a tool to provide management with information on differences in environmental costs and how they are allocated [30]. Furthermore, environmental accounting is a combination of all environmental costs in the company's financial statements, which will ultimately have an impact on sustainable development as it requires responsibility towards society and the environment [31]. It is hoped that the application of green accounting will give consumers confidence that the company is consistent with environmental protection, which will ultimately improve the company's performance.

3. Research Method

This research was conducted on the Indonesia Stock Exchange in 2020 and 2021. The research was conducted on manufacturing companies listed in this period with the criteria that they must report financial statements and participate in the Green Accounting Assessment conducted by the Ministry of Environment of the Republic of Indonesia. The number of samples in this study was 152 companies with observations for 2 years. The total number of observations is 304. This study uses path analysis in hypothesis testing. In using path analysis, regression analysis should be used to estimate the cause of a number of relationships based on theory [32]. In this analysis, two relationships are used, namely direct and indirect relationships, where the direct relationship is where the independent variable directly affects the dependent variable. While the indirect relationship is where the independent variable in affecting other variables must go through other independent variables. In this analysis there are two equations, namely as follows:

Green Accounting= b0+b1xgreen innovation + e

Firm Performance= b0+b2xgreen innovation + b3xgreen accounting + e

4. Result and Discussion

Result

This study aims to determine the direct and indirect effects of green innovation independent variables on firm performance through green accounting. The results of the test are presented in Table 1 below.

Tabel 1. Hypothesis Test

	Original Sample	T Statistics	P Values
Green Accounting -> Firm Performance	-0.013	0.250	**0.803**
Green Innovation -> Green Accounting	0.320	6.239	**0.000**
Green Innovation -> Firm Performance	0.130	2.114	**0.035**

Model 1 tests the effect of green innovation on green accounting as the dependent variable shown in Table 1. Based on the table, it is found that green innovation has a significant effect on green accounting, so the hypothesis is accepted.

In model 2, the independent variables, namely green innovation and green accounting, are tested on firm performance. Based on the test results, only green innovation has a significant effect on firm performance. While green accounting has no significant effect. Next, the effect of green innovation on firm performance is explained indirectly through the effect of green accounting.

Table 2. Indirect Effect

	Original Sample	T Statistics	P Values
Green Innovation -> Firm Performance	-0.004	0.247	**0.805**

Table 2 shows the effect of green innovation on firm performance through green accounting. The analysis uses path analysis. Based on the test obtained that green innovation has no significant effect in increasing or decreasing firm performance through green accounting. Based on the test results, it shows that the hypothesis is rejected.

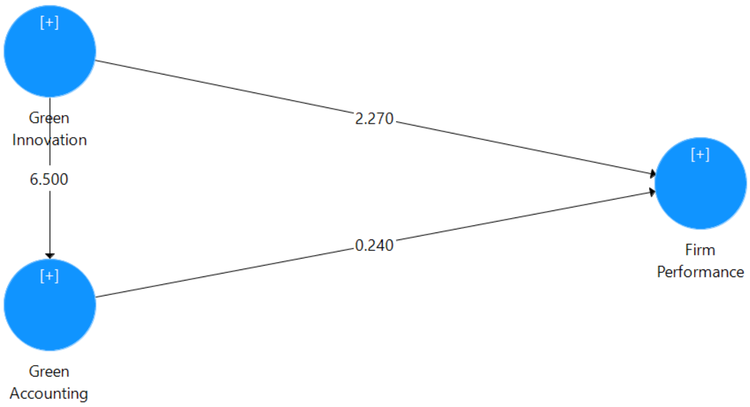

Figure 1 Path Analysis

Discussion

Based on the hypothesis testing, the results show that the implementation of green innovation in the company will have a positive impact on several aspects. One of them is the application of green accounting. We know that green innovation is the concept of process, product or organization based on the environment, where the company does not damage the environment in its business operations and implements strategies in the production process that reduce the negative impact on the environment. This has implications for the application of green accounting. The company is responsible for the company. By applying green accounting, the company will calculate the cost of preventing and reducing environmental damage. The application of green innovation will encourage companies to act more carefully in the production process and report all their expenses and efforts to avoid damaging the environment. This is implemented in corporate social responsibility activities, where the company's net profit must be distributed to the environment. According to the resource-based theory developed by [33], it is said that companies that have high competitiveness must increase the use of resources that are difficult to imitate by other organizations. In this way, competitive advantage is gained. It is therefore important to implement green innovation in order to gain a competitive advantage over other companies.

Green innovation also has a positive impact on corporate performance. Companies that implement this concept are seen by the public as having a good vision and mission and as being concerned about the environment rather than just profit. Consumers are now more careful and concerned about the environment, so they will give preference to companies that use environmentally friendly raw materials and use recycled materials. If the company uses these raw materials, many consumers will choose the product, and in the end the company's profits will increase, which shows increased performance. The findings of this study are in line with the research conducted [34–36] which in turn will increase the value of the company [37].

On the other hand, green accounting shows no significant effect on firm performance. Based on the test results, it is found that there is a negative effect. This shows that companies that focus only on increasing sales without paying attention to green innovation will view environmental care as a burden that will have an impact on reducing company performance.

The company does not plan well and only implements regulations that may have an impact on a decline in performance. Therefore, it is important to plan better by combining different strategies in the implementation. The results of this study contradict the research conducted that green accounting has a significant impact on environmental performance [38], which in turn will have an impact on improving company finances [39,40].

5. Conclusion

The conclusion that can be drawn from this study is that the application of green innovation has a positive and significant effect on the application of green accounting and firm performance, where firms that apply this concept will have a competitive advantage over other firms in terms of products, processes and organization. On the other hand, if the company simply implements the government's green accounting regulations without innovating, it will have no impact on the company's performance. Therefore, it is important for companies to implement green innovation to increase green accounting compliance, which ultimately impacts on company performance and value.

6. References

[1] M. Davenport, M. Delport, J.N. Blignaut, T. Hichert, G. van der Burgh, Combining theory and wisdom in pragmatic, scenario-based decision support for sustainable development, J. Environ. Plan. Manag. 62 (2019) 692–716. https://doi.org/10.1080/09640568.2018.1428185.

[2] X. Xie, J. Huo, H. Zou, Green process innovation, green product innovation, and corporate financial performance: A content analysis method, J. Bus. Res. 101 (2019) 697–706. https://doi.org/10.1016/j.jbusres.2019.01.010.

[3] M. Abdullah, IFRS Mandatory disclosures in Malaysia: the influence of family control and the value (ir)relevance of compliance levels, Account. Forum. 39 (2015) 328–348. https://doi.org/10.1016/j.accfor.2015.05.003.

[4] M.E. Porter, C. Van Der Linde, Toward a New Conception of the Environment-Competitiveness Relationship, J. Econ. Perspect. 9 (1995) 97–118. https://doi.org/10.1257/jep.9.4.97.

[5] C.C.J. Cheng, C.L. Yang, C. Sheu, The link between eco-innovation and business performance: A Taiwanese industry context, J. Clean. Prod. 64 (2014) 81–90. https://doi.org/10.1016/j.jclepro.2013.09.050.

[6] W. Ben Arfi, L. Hikkerova, J.M. Sahut, External knowledge sources, green innovation and performance, Technol. Forecast. Soc. Change. 129 (2018) 210–220. https://doi.org/10.1016/j.techfore.2017.09.017.

[7] A. King, M. Lenox, Exploring the locus of profitable pollution reduction, Manage. Sci. 48 (2002) 289–299. https://doi.org/10.1287/mnsc.48.2.289.258.

[8] J. Aguilera-Caracuel, N. Ortiz-de-Mandojana, Green Innovation and Financial Performance: An Institutional Approach, Organ. Environ. 26 (2013) 365–385. https://doi.org/10.1177/1086026613507931.

[9] C.E. Hull, S. Rothenberg, Firm Performance: The Interactions of Corporate Social Performance with Innovation and Industry Differentiation, Strateg. Manag. J. 29 (2008) 781–789. https://doi.org/10.1002/smj.

[10] C.Z.M. Jamil, R. Mohamed, F. Muhammad, A. Ali, Environmental Management Accounting Practices in Small Medium Manufacturing Firms, Procedia - Soc. Behav. Sci. 172 (2015) 619–626. https://doi.org/10.1016/j.sbspro.2015.01.411.

[11] J. Rezaei, T. Nispeling, J. Sarkis, L. Tavasszy, A supplier selection life cycle approach

integrating traditional and environmental criteria using the best worst method, J. Clean. Prod. 135 (2016) 577–588. https://doi.org/10.1016/j.jclepro.2016.06.125.
[12] R.D. Cairns, Sustainability accounting and green accounting, Environ. Dev. Econ. 5 (2000) 49–54. https://doi.org/10.1017/S1355770X00000048.
[13] C.C. Gonzalez, K.H. Mendoza, Green accounting in Colombia: a case study of the mining sector, Environ. Dev. Sustain. 23 (2020) 6453–6465. https://doi.org/10.1007/s10668-020-00880-1.
[14] P. Bartelmus, Green accounting for a sustainable economy: Policy use and analysis of environmental accounts in the Philippines, Ecol. Econ. 29 (1999) 155–170. https://doi.org/10.1016/S0921-8009(98)00086-X.
[15] C. Wijethilake, Proactive sustainability strategy and corporate sustainability performance: The mediating effect of sustainability control systems, J. Environ. Manage. 196 (2017) 569–582. https://doi.org/10.1016/j.jenvman.2017.03.057.
[16] J. Guerrero-Villegas, L. Sierra-García, B. Palacios-Florencio, The role of sustainable development and innovation on firm performance, Corp. Soc. Responsib. Environ. Manag. 25 (2018) 1350–1362. https://doi.org/10.1002/csr.1644.
[17] M. Aboelmaged, The drivers of sustainable manufacturing practices in Egyptian SMEs and their impact on competitive capabilities: A PLS-SEM model, J. Clean. Prod. 175 (2018) 207–221. https://doi.org/10.1016/j.jclepro.2017.12.053.
[18] I. Miroshnychenko, R. Barontini, F. Testa, Green practices and financial performance: A global outlook, J. Clean. Prod. 147 (2017) 340–351. https://doi.org/10.1016/j.jclepro.2017.01.058.
[19] P. Bansal, Evolving sustainably: A longitudinal study of corporate sustainable development, Strateg. Manag. J. 26 (2005) 197–218. https://doi.org/10.1002/smj.441.
[20] T.A. Chin, H.H. Tat, Z. Sulaiman, Green supply chain management, environmental collaboration and sustainability performance, Procedia CIRP. 26 (2015) 695–699. https://doi.org/10.1016/j.procir.2014.07.035.
[21] T.K. Eltayeb, S. Zailani, T. Ramayah, Green supply chain initiatives among certified companies in Malaysia and environmental sustainability: Investigating the outcomes, Resour. Conserv. Recycl. 55 (2011) 495–506. https://doi.org/10.1016/j.resconrec.2010.09.003.
[22] T.K. Eltayeb, * S.Z., Going Green Through Green Supply Chain Initiatives Towards Environmental Sustainability, Oper. SUPPLY Chain Manag. 2 (2009) 93–110.
[23] G.Y. Qi, L.Y. Shen, S.X. Zeng, O.J. Jorge, The drivers for contractors' green innovation: An industry perspective, J. Clean. Prod. 18 (2010) 1358–1365. https://doi.org/10.1016/j.jclepro.2010.04.017.
[24] V. Siva, I. Gremyr, B. Bergquist, R. Garvare, T. Zobel, R. Isaksson, The support of Quality Management to sustainable development: a literature review, J. Clean. Prod. 138 (2016) 148–157. https://doi.org/10.1016/j.jclepro.2016.01.020.
[25] Y. Fernando, C.J. Chiappetta Jabbour, W.X. Wah, Pursuing green growth in technology firms through the connections between environmental innovation and sustainable business performance: Does service capability matter?, Resour. Conserv. Recycl. 141 (2019) 8–20. https://doi.org/10.1016/j.resconrec.2018.09.031.
[26] G. Albort-Morant, A. Leal-Millán, G. Cepeda-Carrión, The antecedents of green innovation performance: A model of learning and capabilities, J. Bus. Res. 69 (2016) 4912–4917. https://doi.org/10.1016/j.jbusres.2016.04.052.
[27] J. Carrillo-Hermosilla, P. Del Río, T. Könnölä, Diversity of eco-innovations: Reflections from selected case studies, J. Clean. Prod. 18 (2010) 1073–1083.

https://doi.org/10.1016/j.jclepro.2010.02.014.
[28] V. Oltra, M. Saint Jean, Sectoral systems of environmental innovation: An application to the French automotive industry, Technol. Forecast. Soc. Change. 76 (2009) 567–583. https://doi.org/10.1016/j.techfore.2008.03.025.
[29] A.A. Marcus, A.R. Fremeth, Green Management Matters Regardless, Acad. Manag. Perspect. 23 (2009) 17–26.
[30] A. Singh, A. Singh, B.G. Pillai, Interpretive Structural Modelling (ISM) of Enablers Affecting Green Accounting in Indian Manufacturing Sector: A Conceptual Model, Nat. Environ. Pollut. Technol. 21 (2022) 763–767. https://doi.org/10.46488/NEPT.2022.v21i02.039.
[31] M. Lusiana, M.H.C. Haat, J. Saputra, M.Y. Yusliza, Z. Muhammad, A.T. Bon, A Review of Green Accounting, Corporate Social Responsibility Disclosure, Financial Performance and Firm Value Literature, in: Proc. Int. Conf. Ind. Eng. Oper. Manag., 2021: pp. 5622–5640.
[32] I. Ghozali, Aplikasi Analisis Multivariate dengan Program IBM SPSS 25, Badan penerbit Universitas Diponegoro, Semarang, 2018.
[33] S.L. Hart, S.L. Hart, A Natural-Resource-Based View of the Firm, Acad. Manag. Rev. 20 (1995) 986–1014.
[34] N.A. Abu Seman, K. Govindan, A. Mardani, N. Zakuan, M.Z. Mat Saman, R.E. Hooker, S. Ozkul, The mediating effect of green innovation on the relationship between green supply chain management and environmental performance, J. Clean. Prod. 229 (2019) 115–127. https://doi.org/10.1016/j.jclepro.2019.03.211.
[35] A. Banani, B. Sunarko, Nexus between Green Finance, Creativity, Energy Accounting and Financial Performance: Banks Sustainability Analysis from Developing Country, Int. J. Energy Econ. Policy. 12 (2022) 447–455. https://doi.org/10.32479/ijeep.13806.
[36] T. Hirunyawipada, G. Xiong, Corporate environmental commitment and financial performance: Moderating effects of marketing and operations capabilities, J. Bus. Res. 86 (2018) 22–31. https://doi.org/10.1016/j.jbusres.2018.01.002.
[37] D. Agustia, T. Sawarjuwono, W. Dianawati, The Mediating Effect of Environmental Management Accounting on Green Innovation - Firm Value Relationship, Int. J. Energy Econ. Policy. 9 (2019) 299–306. https://doi.org/10.32479/ijeep.7438.
[38] I.G.K.A. Ulupui, Y. Murdayanti, A.C. Marini, U. Purwohedi, Mardi, H. Yanto, Green accounting, material flow cost accounting and environmental performance, Accounting. 6 (2020) 743–752. https://doi.org/10.5267/j.ac.2020.6.009.
[39] S.P. Hendratno, Corporate Point of View in Green Accounting, Binus Bus. Rev. 7 (2016) 247. https://doi.org/10.21512/bbr.v7i3.1499.
[40] R. Marota, Green Concepts and Material Flow Cost Accounting Application for Company Sustainability, Indones. J. Bus. Entrep. 3 (2017) 43–51. https://doi.org/10.17358/ijbe.3.1.43.