



Innovation and Corporate Sustainability Performance: Empirical Evidence from Indonesia

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Abstract. During globalization and economic uncertainty, companies are required to continue to innovate to increase their competitive advantage. In addition, management should not ignore stakeholder encouragement for sustainable practices within the company. This study aims to provide empirical evidence about the relationship between innovation and the company's sustainability performance. Using data provided by Thomson Reuters, we tested 423 observations from 2013 to 2022. We use the GLS fixed-effect regression method in testing the hypothesis. The results show that the company's level of innovation has a positive effect on the company's sustainability performance. These findings conclude that innovation is an important factor to improve a company's sustainability performance. This research has academic and practical implications, where research connecting the two variables is still very rare. While the practical implication is that management can encourage companies to invest more in innovation activities to improve the company's sustainability performance. Likewise, the government also needs to encourage corporate innovation by providing stimulus and relevant legal umbrellas.

Keywords: Innovation, Green Innovation, Sustainability Performance.

1 Introduction

Globalization allows the national economy to be connected with the global economy which has an impact on an extraordinary increase in global trade and international business [1]. This is evidenced in the WTO report [2] noted that global trade experienced a significant increase from 2008 to 2018. However, at the end of 2019 the economic crisis stemming from the health crisis had hampered, even destroyed, the economies of almost all over the world. The world knows him with the COVID-19 disaster. A disaster that is even believed to be as severe as the Spanish flu pandemic and the Great Depression [3]. To deal with the spread of the virus which will be increasingly widespread, the government has implemented several policies such as lockdowns and social restrictions. Even though it was tough, this policy had to be taken with the consequence that people's economic activities would stop completely. As a result, many companies have collapsed. Globalization and the uncertain economic environment are forcing companies to survive among their competitors [1]. This competitive environment requires companies to continue to innovate with the times. History records that companies that constantly innovate are usually valued more than their competitors. The award is characterized by growth, increased profits, and access to new markets [4].

In addition, innovation has also been proven to be one of the important keys to a company's competitive advantage [5]. In his literature review, Boons [5] stated that through business model innovation, companies can maximize their competitive advantage while

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creating and delivering value to their customers. Ironically, not all innovations made by companies pay attention to the impact that their innovation strategy can have. Many companies force an innovation strategy to gain competitive advantage by ignoring crucial social and environmental issues [6]. This kind of practice began to receive opposition from the public and international organizations. In the last few decades there has been an increase in awareness of the importance of protecting nature through the effective and efficient use of natural resources. This concept is known as sustainable development. This concept has existed since the publication of the Brundtland Report [7] in 1987 initiated by the United Nations. The report states that sustainable development is an effort to meet current needs without disturbing human needs in the future. The importance of preserving nature gained momentum when the United Nations formulated 17 sustainable development goals (SDGs) in 2015. After that time, every aspect of world society, including companies, tried to fulfill their social and environmental responsibilities to maintain the sustainability of planet Earth. Governments in many countries also include these 17 SDGs in their programs [8]. Not only the government and environmentalist organizations, but academics are also flocking to research every aspect of this sustainability. However, research linking innovation with sustainability is still very rare. Moreover, we have not been able to find research that provides empirical evidence about the influence of innovation by companies on their sustainability performance. This study aims to empirically examine the effect of corporate innovation on sustainability performance. We use sustainability performance data from Thomson Reuters from 2013 to 2022. Data processing is assisted by STATA software using fixed-effect panel data regression. To provide a more comprehensive picture, the next section will discuss the theory used and how our hypotheses were developed. Then, the third part contains details of the methods, variable measurements, and the models used. The fourth section contains the results of the analysis. Finally, this research will be closed with conclusions and future research directions.

2 Literature Study dan Hypothesis development

2.1 Legitimation Theory

Legitimacy theory departs from the idea that for an organization or company to carry out its operations in the long term, they must understand the boundaries identified by society as acceptable behavior [9]. This theory also argues that companies will always manage shifts in public perceptions which can be bad for business continuity. This is part of the legitimacy process in which the company tries to change the social perceptions, values, and expectations of the people in the environment associated with the company [10]. Even though legitimacy comes from outside the company, legitimacy can be recognized by the company itself. This shows that values and norms in society are important factors that influence the actions or strategies that can be taken by a company [9]. To manage legitimacy, companies must understand how legitimacy can be obtained, changed, or even lost. Because the values and norms that exist in society are dynamic and can change over time. Wartick and Mahon [11] further explain that legitimacy gaps can occur in the following 3 conditions a) The company's performance changed for the worse, while the community's expectations remained the same, b) The company's performance remains the same when the public's expectations of the company's performance are increasing; or c) Whether company performance or societal expectations change, these changes move in different directions.

Today, the values and norms of society internationally are moving towards a shared awareness that every living human being is indebted to the planet [4,6]. This is due to the condition of natural damage that occurs, which triggers disasters, hunger, air pollution, including in relation to the COVID-19 disaster [3]. Nature conservation is a collective work and, in the context of a company, everything that is taken from nature must be returned to nature. Based on this theory, every innovation made by a company must think about the sustainability aspect to gain legitimacy from society.

2.2 The Relationship between Innovation and Corporate Sustainability Performance

In a broader sense and in a business context, innovation covers many aspects of a company including products or services, systems, processes, methods, and so on. Innovation can be defined as the significantly improved implementation of new products or processes, such as the use of new marketing methods or new organizational methods applied in business practices, workplaces, and in the company's external relations[12]. Innovation strategies can vary between companies, even between times in the same company. Innovation is a dynamic activity that follows market demand, technological developments, the competitive environment, and the company's internal needs.

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Previous research that examines corporate innovation is dominated by studies on the determinants of innovation [13–15]. Based on these studies, the factors that influence innovation are divided into two, namely internal and external factors of the company

[14]. Internal factors are represented by size, capability, governance, board characteristics, and company structure [13]. Meanwhile, external factors that can affect company strategy and performance include government support, market structure, and industry characteristics [14,15]. More recent research has concluded that there are major challenges for companies wishing to innovate or are innovating regarding long organizational cycles, legitimacy risks, and sustainability. So that the innovation process must still involve the expectations of other stakeholders who are bound by the company.

The relationship between innovation and sustainability is still being studied to obtain more acceptable conclusions. Legitimacy theory also helps explain this relationship with the view that norms and values that are believed by society can be pressure on companies that affect corporate sustainability practices and shift internal company practices in the form of processes, structures, strategies, and outputs [10]. So that the company's involvement with its stakeholders can directly encourage the company's innovation activities towards more sustainable practices.

Research from Dicuonzo et al. [16] tried to confirm the above assumptions by examining 182 companies in European countries for 7 years. The results show that companies that invest more in innovation have higher sustainability performance than other companies. This shows that companies are starting to realize the importance of social-environmental responsibility for sustainability while continuing to innovate to maintain their competitive advantage. Based on the theory and findings from the previous literature, the hypotheses developed in this study are as follows.

Hypothesis: The level of innovation has a positive effect on the company's sustainability performance.

3 Research Method

3.1 Sample dan Research Data

The population in this study were all companies listed on the Indonesia Stock Exchange (IDX) during the period 2013 to 2022. However, due to limited data from several companies, we used a purposive sampling method to eliminate companies with incomplete data. The final sample that is ready to be processed in this study is 423 observations. Data obtained from the Thomson Reuters database, both data on sustainability performance, level of innovation, and other financial data needed to build research models. The use of data from third parties has been widely used in other studies. In addition to facilitating, this aims to avoid subjectivity from researchers.

3.2 Operationalization Variables

There are three categories of variables used in this study, namely dependent variables, independent variables, and control variables. The dependent variable in this study is the company's sustainability performance. The company's sustainability performance refers to three main aspects, namely environmental, social, and governance. These three aspects are known today as ESG. Thomson Reuters measures a company's ESG or sustainability performance using 400 company-level measurements and 178 other relevant data to strengthen the assessment. This step is based on aspects of materiality considerations, industry relevance, and data availability [17]. While the independent variable used is the level of company innovation. The level of corporate innovation is how the company creates new market opportunities through the creation of products, the use of new technologies and methods. Finally, to avoid omitted variable bias, we add additional variables that are believed to also affect sustainability performance in accordance with relevant previous studies. We call these control variables because they are not the focus for testing the effect on the dependent variables. The control variables used in this study include company size as measured using the natural logarithm of total assets, leverage as measured by total debt divided by total assets, income levels as measured by the natural logarithm of income, and profitability as measured using return on assets.

3.3 Techniques and Research Models

The data set combines time span data and between individual observations, this study uses panel data regression. Prior to testing, we conducted the Breusch and Pagan Lagrangian multiplier test and the Hausman test to determine whether the data in this study were more suitable for using ordinary least squares (OLS) or generalized least squares (GLS), either GLS fixed-effect or GLS random-effect. While the model used is as follows.

$$SP = \beta_0 + \beta_1 \text{Innovation}_{it} + \beta_2 \text{Size}_{it} + \beta_3 \text{Lev}_{it} + \beta_4 \text{Rev}_{it} + \beta_5 \text{Roa}_{it} + \varepsilon_{it}$$

SP = Sustainability performance

Innovation = The level of company innovation

Size = Company size

Lev = Leverage

Rev = Company revenue

Roa = Company profitability

4 Results and Discussion

4.1 Descriptive Statistic

Table 1 presents descriptive statistics of the entire sample data in this study. The total sample is 423 observations. Table 1 also shows the average, minimum, and maximum values. The average value of sustainability performance (SP) is 46,926 or below 50%, with a maximum value of 89.64 and a minimum value of 8.16. The value of the company's sustainability performance in the sample is quite varied. Likewise with the innovation variable where there are observations that get a value of 0 and some have a value

of 94.34. While the average of these variables is 17,127. It can be said that most companies in Indonesia that are included in the research sample have a low level of innovation.

Table 1. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
<i>SP</i>	423	46.926	20.619	8.162	89.644
<i>Innovation</i>	423	17.127	27.561	0.000	94.34
<i>Size</i>	423	31.349	1.300	26.687	35.162
<i>Lev</i>	423	0.492	0.208	0.1490	0.878
<i>Rev</i>	423	30.611	1.248	25.469	33.339
<i>Roa</i>	423	0.069	0.068	-0.206	0.206

Notes: *SP* = Sustainable performance; *Innovation* = Company innovation level; *Size* = Company Size; *Lev* = leverage ratio; *Rev* = Revenue; *Roa* = profitability's

4.2 Univariate Analysis

Table 2 is the result of univariate testing. Univariate testing aims to assess the correlation between variables. We use the Pearson correlation test for this purpose. Based on Table 2, there are several variables that are correlated with other variables. For example, the Innovation variable is correlated with the SP variable with a significance level below 1%. Likewise with the variables Size, Lev, and Rev. This shows that the variables mentioned affect the company's sustainability performance (SP), assuming that there are no other variables that affect it. In addition, several variables that affect the level of company innovation (Innovation) include Size, Lev, and Rev.

Even though the Innovation variable influences the SP variable univariately, multivariate analysis is still needed as a hypothesis testing tool. To test whether there is a multicollinearity problem, Table 2 also presents the results of the variance inflation factor (VIF). The results show that there are no independent variables that have a vif value of more than 10, so it can be stated that there is no multicollinearity problem in this study's data.

Table 2. Analysis Result Univariate

Variables	VIF	(1)	(2)	(3)	(4)	(5)	(6)
(1) SP		1.000					
(2) Innovation	1.212	0.356*** (0.000)	1.000				
(3) Size	3.184	0.348*** (0.000)	0.382*** (0.000)	1.000			
(4) Lev	1.481	0.157*** (0.001)	0.184*** (0.000)	0.356*** (0.000)	1.000		
(5) Rev	2.948	0.296*** (0.000)	0.350*** (0.000)	0.710*** (0.000)	-0.004 (0.928)	1.000	
(6) Roa	1.536	0.017 (0.720)	0.026 (0.595)	-0.181*** (0.000)	-0.444*** (0.000)	0.232*** (0.000)	1.000

Note: SP = sustainability performance; Innovation = level of company innovation; Size = company size; Lev = leverage ratio; Rev = revenue; Roa = profitability. *** significance level < 1%, ** significance level < 5%, * significance level < 10%.

4.3 Hypothesis Testing

Before testing the hypothesis, we conducted the Breusch and Pagan Lagrangian multiplier and Hausman tests to determine the best model for estimating the research data. Breusch and Pagan Lagrangian multiplier is used to choose whether the model is better estimated with OLS or GLS. Then, the Hausman test is used to select a random-effect or fixed-effect GLS. Table 3 shows that after the test, the model in this study is better to use the GLS fixed effect.

Table 3. Model Selection Results

Test	chi2 value	Prob>chi2	Notes
Breusch and Pagan Lagrangian multiplier	1083.61	0.0000	Cenderung ke GLS
Hausman	42.72	0.0000	Cenderung ke GLS <i>fixed-effect</i>

Furthermore, Table 4 presents the results of hypothesis testing. The table shows that the Innovation variable has a positive effect on the SP variable with a coefficient value of 0.085. This means that for every 1-point increase in the innovation variable, the SP variable increases by 0.085, the research hypothesis is accepted.

Table 4. Hypothesis Testing Results

Variable	Coef.	t-value	p-value
Innovation	0.085	2.79	0.003
Size	14.371	7.07	0.000
Lev	-14.783	-1.97	0.025
Rev	3.347	2.55	0.006
Roa	-7.613	-0.62	0.267
Constant	-499.698	-9.36	0.000
Obs		423	
R-sq		0.2970	
F Value		29.32	
Prob > F		0.0000	

Note: SP = sustainability performance; Innovation = level of company innovation; Size = company size; Lev = leverage ratio; Rev = revenue-tan; Roa = profitability. *** significance level < 1%, ** significance level < 5%, * significance level < 10%.

This finding is in line with previous studies which also found that today's corporate innovation activities are an important factor for improving corporate sustainability performance [16]. Forms of innovation that are in line with sustainable goals are often referred to as green innovation. The shift from innovation that ignores social-environmental aspects to innovation based on sustainability requires a change in the concept of processes, methods and technologies used that are more environmentally friendly. Furthermore, companies must integrate the concept of green innovation into corporate strategy [5,6]. Previous studies have also concluded that sustainable-based innovation does not only aim to gain legitimacy from society, but also encourages the creation of long-term corporate value, which in turn has a positive impact on shareholders and other stakeholders [16].

5 Conclusion

Over the last few decades, the international community has begun to recognize the importance of protecting the environment to ensure that future generations can meet their needs. Then the COVID-19 pandemic that hit almost the entire world has increased this concern. In the context of companies, which are required to continue to innovate to maintain a competitive advantage, they are also encouraged not to neglect their social-environmental responsibility. Based on legitimacy theory, companies are part of society that cannot be separated from the values and norms that are believed in that community. This study examines the effect of corporate innovation in Indonesia on their sustainability performance. With this evidence, we can confirm whether the innovations that companies make also improve their sustainability performance. Using data provided by Thomson Reuters on 423 samples, we tested the GLS fixed-effect regression method. The results show that our hypothesis is accepted, namely innovation is an important factor to improve the company's sustainability performance. This research has both academic and practical implications. For academics, this research can be a first step to further examine the relationship between innovation and sustainability performance, because research linking these two variables is still rare. While the practical implication is that management needs to encourage companies to invest more in innovation to improve their sustainability performance. Finally, regulators can encourage corporate innovation by providing adequate stimulus and legal protection for the company's sustainable innovation practices.

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