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# The Effect of Sustainability Innovation, Organizational Learning on Firm Performance with Competitive Advantage as Moderation

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## Abstract

**Purpose:** The dynamics of Industry 4.0, globalization and economic turmoil have urged organizations to learn and adapt to accelerate performance and remain competitive. Companies are looking for strategies to ensure that their organizations thrive in a hypercompetitive environment. This research investigates the significance of sustainability innovations and organizational learning to achieve superior firm performance with a competitive advantage as a mediating variable. **Originality/value:** Bibliometric studies show that the study of Sustainability innovations aimed at business areas are still rare. Therefore, the potential of this research is to make management aware as policymakers in the organization of the urgency to create sustainable innovations to be able to compete and achieve better firm performance. **Design/methodology/approach:** This study was collected using a survey; Then, an integrative research model was made to analyze the relationship using structural equation modelling with partial least squares (PLS) using the snowball sampling method to reach more respondents. The sample of this research is the financial and manufacturing sector companies in Indonesia. **Findings:** Sustainability innovation, organizational learning, and competitive advantage have a significant effect on company performance. Sustainability innovation has a positive but not significant effect on company performance with a competitive advantage as moderating. Sustainability of innovation and change related to management who has company knowledge to provide experience to the company can support its performance and potentially create a competitive advantage among its competitors, which will affect the achievement of better performance.

**Keywords:** Sustainability Innovations, Organizational Learning, Firm Performance, Competitive Advantage, Indonesia.

## Introduction

The use of resources and the resulting population and economic growth emissions have added to the environmental burden (United Nations, 2019). Scientific evidence on the detrimental effects and unintended social and environmental consequences of this trend has increased external pressure on companies to react to these challenges and to address issues related to climate change and social and environmental degradation (Cai & Li, 2018; El-Kassar & Singh, 2019; Lubberink et al., 2017). In addition to external pressures to become more sustainable, businesses face increasing competition due to globalization and new

technologies (Aggarwal, 2011; Cherrafi et al., 2018). These combined pressures have increased the focus on creating green and sustainable value among businesses and focused on whether sustainability innovations can solve both of these problems and simultaneously increase sustainability and competitiveness (Chu et al., 2018).

Several previous research results have attempted to clarify research on the relationship between innovation performance and sustainability. For example, (Tariq et al., 2019) reviewed the drivers, consequences, moderators, and mediators of green innovation, but their study was inconclusive and calls for further research on how organizational factors influence green innovation and its outcomes. Recent research conducted by Bitencourt et al. (2020) examining the drivers, consequences, and moderators of eco-innovation in a meta-study of quantitative studies in the field. They found a positive relationship, but this study lacked investigations into mediation and moderating effects. Furthermore, research studies have been conducted on success factors (De Medeiros et al., 2014) and environmental drivers of innovation (Hojnik & Ruzzier, 2016b). However, the study of Adams et al (2016) noted, the development of theory related to the topic in the literature shows the characteristics of immaturity. It fails to explain the mechanisms and conditions associated with various environmental innovations and their effects on business performance.

The relationship between corporate sustainability and competitiveness has attracted much attention among academics, but the findings have been fragmented and inconclusive (Cai & Li, 2018; Hussain et al., 2018; Rezende et al., 2019). For a long time, many companies view sustainability innovations as a cost driver (Dey et al., 2020). They are seen as innovations that require a high initial investment, have a long payback period, and produce only limited environmental benefits (Cai & Li, 2018; Hojnik & Ruzzier, 2016). However, several recent studies have shown a significant and positive relationship between sustainability innovations and firm competitiveness (Bacinello et al., 2020; Suat & San, 2019; Qiu et al., 2020). For example, it has been found that countries and businesses are showing an increasing trend towards sustainability (Dey et al., 2020; Almeida & Amoedo, 2020), and it is argued that this is because sustainability is associated with profitability, efficiency, and competitiveness (Cherrafi et al., 2018). These inconclusive and sometimes contradictory findings suggest that the relationship is complex, and further research is needed to establish how and under what conditions the relationship remains positive. Several previous reviews have attempted to clarify research on the innovation-performance relationship of sustainability. For example, Tariq et al (2019) reviewed the drivers, consequences, moderators, and mediators of green innovation, but their study was inconclusive and calls for further research into how organizational factors influence green innovation and its outcomes. Recently, Bitencourt et al (2020) examine the drivers, consequences, and moderators of eco-innovation in a quantitative meta-study in the field. They found a positive relationship, but this study lacked investigations into mediating and moderating effects. Furthermore, review studies have been conducted on the success factors (De Medeiros et al., 2014) and the drivers of environmental innovation (Hojnik & Ruzzier, 2016b). However, as Adams et al (2016) noted, the development of theories related to topics in the literature shows the characteristics of immaturity. So it fails to explain the mechanisms and conditions associated with various environmental innovations and their effects on business performance.

Common to all previous reviews is that they mainly focus on environmental innovation and exclude social issues that fall under the definition of sustainability (Elkington, 1997). Moreover, as they show that the literature is still pointing in different directions, there is an urgent need to examine the art of the relationship between sustainability innovations and

corporate competitiveness (Hussain et al., 2018; Lopes Santos et al., 2019). In particular, they call for more research on how different conditions, such as internal and external factors, affect the outcomes of sustainability innovations (García-Sánchez et al., 2020; (Ghassim & Bogers, 2019; Hojnik & Ruzzier, 2017; Rezende et al., 2019). Studying the relationship between sustainability innovations and competitiveness is necessary to meet our academic need for knowledge. It is also essential for managers who wish to take advantage of business strategies based on sustainability innovations (Bossle et al., 2016). Incorporating sustainability into business is likely to be critical to preserving future business (Severo et al., 2017).

The dynamics of Industry 4.0, globalization, and economic turmoil have urged organizations to learn and adapt to accelerate performance and remain competitive. Business leaders seek strategies to ensure that their organizations thrive in a chaotic hypercompetitive environment. Knowledge and learning have been identified as essential resources for organizations to maintain success and competitive advantage (Chandler, 1992; Crittenden & Young, 1996; Weldy, 2009). Senge (2017) states that "in the long run, superior performance depends on superior learning." Many recent studies show a growing interest in organizational learning (OL), emphasizing that organizations must promote learning to achieve improved performance (Jain & Moreno, 2015; Zhou et al., 2015; Young Oh & Han, 2020; Ismail et al., 2019).

The strong emphasis placed on OL as a critical determinant of firm performance (FP) has encouraged academics to pursue research pathways in this field. OL subsequently became popular in the 1980s and 1990s, marked by several seminal contributions (Hedberg & Arbetslivscentrum, 1979; Fiol & Lyles, 1985; Argote & Epple, 1990; March, 1991; dan Huber, 1991). Senge (2017) created a learning organization and popularized it in his best-selling book *The Learning Organization's Art and Practice* is the fifth discipline. Despite much debate about OL and learning organizations (Örtenblad, 2001; Sun & Scott, 2003; Easterby-Smith et al., 2000), strong bias and confusion still exist about the use of the two concepts (Nevis et al., 1995; Wang & Ahmed, 2003). According to Easterby-Smith et al (2000), OL describes individual and collective learning processes in organizations, whereas organizational learning proposes combining disciplines and practices to encourage learning. This study focuses on OL and defines it as a learning activity that benefits FP (Shaw & Perkins, 1991; Hodgkinson, 2000).

Academics have discussed the concept of OL extensively. In the 1980s, Argyris & Schön (1997) conceptualized OL as single and multiple loop learning. The former considers changes to the company's expected outcomes, while the latter challenges and redefines these changes and expectations. Single and multiple loop learning can also be considered adaptive and generative learning (Senge, 2017). Previous studies have assumed that adaptive learning is suitable for firms operating in slow-changing environments, and generative learning is essential for firms operating in dynamic markets (Wijnhoven, 2001). March (1991) categorizes the learning process into using existing routines from prior knowledge and exploration for new routines and knowledge. Huber (1991) discusses some of the shortcomings in the previous OL approach and postulates four constructs of information systems in organizations. Information acquisition is about learning from various sources such as experiences within the organization, experiences of other organizations, and knowledge from the internal and external environment. Information distribution is concerned with sharing knowledge across the organization. Information interpretation is how the organization understands the information it obtains and shares. Organizational memory refers to the storage and retrieval of information. In addition, academics have previously advocated the idea that OL occurs at

different levels (individual, group, organizational), and two types of learning facilitate the flow of learning outcomes called feedforward and feedback (Crossan et al., 1999; di Milia & Birdi, 2010; Lloria & Moreno-Luzon, 2014).

Firm performance is a controversial concept discussed in academic circles (Jenatabadi, 2015). It has been defined as the actual output of an organization compared to the desired goals (Kotlar et al., 2018; Škrinjar et al., 2008). The literature shows that there has been a diversity of concepts and performance measures. Financial performance is the narrowest conception of performance and has dominated empirical studies (Venkatraman & Ramanujam, 1986). Typical financial performance indicators involve sales growth, return on investment, earnings per share, and soon (Venkatraman & Ramanujam, 1986). However, financial ratios are insufficient to measure the potential effect of learning on business performance (Prieto & Revilla, 2006; Baldwin & Danielson, 2002). Neely (2007) suggested that non-financial performance indicators such as learning and customer satisfaction should measure firm performance. As a result of several discussions on firm performance measures, various approaches that cover both financial and non-financial perspectives have been provided. For example, Lockwood (2007) introduces a multi-model performance framework involving productivity, market performance, employee motivation, and social impact.

This study identifies two main issues in the literature regarding the term sustainability. First, as several researchers have pointed out, the main problem with current research on sustainability innovations is that the term is often reduced to environmental improvement, turning it into a one-dimensional concept (Klewitz & Hansen, 2014; Seuring & Müller, 2008). However, sustainability is a broader concept because it includes social aspects (Ben Arfi et al., 2018). Therefore, researchers call for a more holistic approach, in which the social dimension is considered (Adams et al., 2016) because, therefore, this study aims to include the pillars of environmental sustainability and social pillars with this literature review. The second problem with the definition of sustainability innovations is that the environmental pillar has various synonyms used in the literature (Adams et al., 2016). In general, the terms “sustainable innovation”, “environment”, “green”, and “eco-innovation” are mainly used synonymously in the literature (Adams et al., 2016; Forsman, 2013; Hojnik & Ruzzier, 2016b; Karakaya et al., 2014). In a recent literature review, it has been noted that there are only minor differences between the terms and the terms are often used interchangeably (Schiederig et al., 2012; Tariq et al., 2019). Due to synonyms of these concepts in the literature, this study felt the need to include all of them in this research literature search, which represent the pillars of environmental sustainability. Therefore, for this review, this study has adopted the following broad definition: Sustainability innovations are innovations in which all dimensions of sustainability, including environmental, social, and economic, are considered during the entire innovation process. Therefore, the aim is to avoid or reduce negative impacts on the environment while considering social aspects in all steps of the innovation process and at the same time doing so profitably to sustain the business. This study argues that the innovations included in this study fall within this definition for all practical purposes.

The Covid -19 pandemic has caused a significant change in consumer behavior, forcing companies to make various innovations and changes to organizational learning to improve company performance. The following is a list of the six sections that make up this article. The following section includes a literature review and hypotheses. Following that, sample selection and data collection methodology were discussed, followed by data analysis and results. And then, the paper concludes with an examination of the research findings, limitations, and conclusions.



## Literature Review and Hypothesis Development

### Triple Bottom Line and Sustainability Innovations

Elkington (1997) was introduced the Triple Bottom Line (TBL) concept. At that time, he focused on three dimensions to measure company performance, including economic, environmental, and social considerations. Environmental refers to the sustainable and efficient use of energy and other natural resources by decreasing adverse effects and environmental damage due to inefficient resource use (Chavez et al., 2020). However, 25 years later, Elkington (1997) emphasizes that most of these goals have been forgotten, and "triple bottom line" thinking has been reduced to accounting tools. Elkington points out that TBL cannot achieve without a breakthrough change in the sustainable sector. Hence, innovation is essential to achieve TBL performance. Continuous innovation is accomplished by creating brand-new products, processes, services, and technologies that contribute to the organization's growth and well-being while conserving natural resources (Hermundsdottir & Aspelund, 2021; Tello & Yoon, 2008).

To understand the competitive relationship between sustainability innovations, we need to understand how it is conceptualized in the academic and popular literature. There are two opposing views on how sustainability innovations and competitiveness are connected (Tariq et al., 2019; Hussain et al., 2018). According to the traditionalist view, sustainability innovations are seen as a cost driver (Tariq et al., 2019; Palmer et al., 2018; Clarke, 1994). For example, Clarke (1994) claims that the popular notion of environmental improvement that creates a win-win situation for companies is unrealistic because of the high costs and complex solutions. Rising costs, risks, inadequate government support, and regulations related to sustainability innovations can undermine competitiveness (García-Sánchez et al., 2020). Therefore, according to this view, sustainability innovations are considered a zero-sum trade-off between the environment and the economy.

### Sustainability Innovations and Firm Performance

The hypothesis of this research Regarding the revisionist view, there are several arguments why sustainability innovations can increase the competitiveness of companies. First, sustainability innovations can lead to more efficient processes by reducing raw materials and the consumption of energy and resources in terms of water, waste, land, and oil (Gürlek & Tuna, 2018; Chiou et al., 2011). Second, they can improve product quality and efficiency through reduced material consumption, less hazardous materials and less packaging, and increased use of recyclable materials (Dey et al., 2020). Third, they can improve managerial processes by using assessment methods such as environmental management systems that make it easier to identify and realize cost savings and productivity improvements (Hojnik & Ruzzier, 2017). Fourth, launching sustainable products is an efficient way to take advantage of the opportunities associated with the increasing number of customers who care about the environment and society. Hence, it can result in product differentiation, a growing customer base, and improved market and brand positioning (García-Sánchez et al., 2020), then the first hypothesis is proposed as follows:

H1: There is a positive and significant influence between Sustainability Innovation on company performance.

### Organizational Learning and Firm Performance

Firm performance provides essential feedback about the efficiency of the learning process and ultimately influences how organizations continue to learn (Bontis et al., 2002).

Organizational learning breeds creativity and innovation, which facilitates the development of new products. Andersen (2000) suggests that managers' learning abilities enable organizations to respond to market conditions that favour companies are operating in dynamic and complex environments. Schäffer & Willauer (2003) suggest that learning is a cybernetic feedback loop that involves individuals at different organizational levels. They observe that learning aims to adopt an internal model in which members modify the interpretation of events and develop a shared understanding to increase output. Crossan et al (1999a) argue that learning results in a better understanding of the underlying business systems and, in effect, enables organizations to seize open opportunities while minimizing threats. Learning is very essential in business performance. Bontis et al. (2002) research supports the view that there is a positive relationship between learning and business performance. The study's findings reveal that learning at the individual, group, and institutional levels is critical to overall company performance. From a dynamic capability point of view, organizational learning is seen as a means to develop dynamic capabilities valued by customers and difficult to imitate to contribute to competitive advantage (Crossan & Berdrow, 2003; Sisnuhadi & Nasir, 2013)., then the first hypothesis is proposed as follows:  
H2: There is a positive and significant influence between organizational learning on company performance.

### **Competitive Advantage and Firm Performance**

Companies with a competitive advantage show that they are of higher value than their competitors in high quality, on-time delivery, high flexibility, and low cost. Li et al. (2006) stated that competitive advantage would bring companies to a higher level of economic performance, effective relationships, loyalty, and customer satisfaction. Companies that offer high-quality products will have a high reputation in the market, reduce costs, and have high productivity (Amoako-Gyampah & Acquah, 2008), which increases market share and sales profit margins and return on investment (Li et al., 2006). Fast and precise delivery time will make the company win orders because they are the first to have a higher market share and sales (Chi et al., 2009). High flexibility in the production process will allow the company to respond quickly to any changes in the market to create performance improvements. At the same time, the ability to create low production costs to produce products at relatively low prices will increase efficiency and lead to increased market share and sales growth. In short, companies that have a competitive advantage indicate that companies gain more capabilities than their competitors. Competitive advantage is owned as the company's ability which will ultimately improve the company's performance. Based on the discussion above, the following hypothesis is formulated:

H3: There is a positive and significant influence between competitive advantage on company performance.

### **The Influence between Sustainability Innovation and Firm Performance Moderated by Competitive Advantage**

Previous research has identified various drivers for the adoption of sustainability innovations. Díaz-García et al (2015) argue that these drivers fall into two main categories: external pressures from governments and stakeholders (for example, in the form of regulations) and internal motivations to increase competitiveness (for example, through reduced operating costs). Several studies confirm that regulation is an essential driver of sustainability innovations and that firms that comply with regulations are more likely to

innovate for sustainability than firms that do not (Doran & Ryan, 2012; Horbach et al., 2012). Another study found the driver to emerge from the motivation to increase competitiveness. For example, Charter & Clark (2007) find that market and financial-related drivers, such as customer requirements, company brand and reputation, and cost savings in terms of materials and energy, are essential drivers for adopting sustainability innovations. Sometimes, regulation and the pursuit of competitiveness act together to encourage sustainability innovations (Horbach et al., 2012). However, (Yalabik & Fairchild (2011) find that competitive pressures from markets drive environmental innovation more than regulation and, therefore, motivate more research on the role of sustainability innovations in increasing competitiveness. Based on the theoretical review, thus, the second hypothesis is proposed as follows:

H4: There is no significant effect between sustainability innovation and firm performance moderated by competitive advantage.

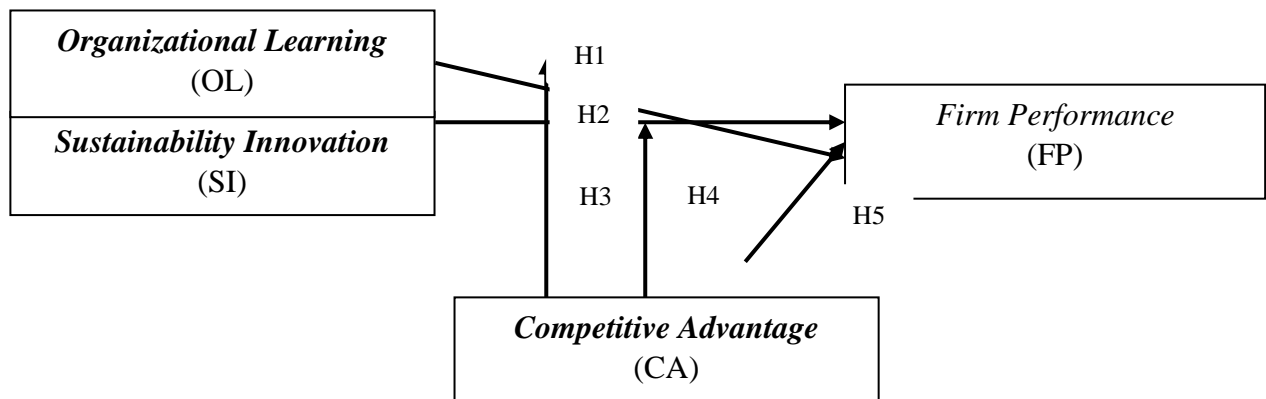
### **The Influence between Organizational Learning and Firm Performance Moderated by Competitive Advantage**

Organizational learning refers to learning from the internal and external environment, which mainly focuses on improving service or product processes, updating existing skills, and adding experience (Li et al., 2014). Brookes & Altinay (2017), in their qualitative case study of the tourism and hospitality industry, using US franchisors and European master franchisees, found that organizational learning provides an opportunity to locate, recognize, and identify foreign activities, which in turn provides better value. for hotels and enable them to respond quickly to heterogeneous environments. In the highly competitive tourism industry, organizational learning enables hotels to adapt to risk and encourages flexibility and innovation to capture new opportunities under conditions of uncertainty. On the other hand, organizational learning "creates reliability in the experience through refinement, routine, production, and implementation of knowledge" (Holmqvist, 2004), which means applying familiar knowledge and skills into corporate practice. Thus, organizational learning is characterized by "deepening, refining, selecting, and implementing existing knowledge in expanding or enriching current customer value" and focusing on "deep search of knowledge domains to pursue best solutions or alternative ways to develop competencies, technologies and improve how they are used" (Kang et al., 2007). Thus, the following hypotheses are presented:

H5: There is significant effect between organizational learning and firm performance moderated by competitive advantage.



**Figure 1** In our conceptual framework, we describe the variables that affect firm performance.



Source: Elaborated by the authors

## Method

### Sample and Data Collection

This study examines Indonesia's manufacturing and financial sectors, as these sectors face tremendous pressure during the Covid-19 pandemic. This study uses primary data by distributing questionnaires to the intended respondents. The unit of analysis is individuals in the company who have positions as middle and top management. We selected survey-based studies in the absence of a comprehensive database covering innovation sustainability and organizational learning. Since the study was conducted in a pandemic situation, we used the Snowball sampling method to reach more respondents. We hope they are willing to participate based on referrals from their peers. Questionnaires were distributed via email. Of the 162 questionnaires, five were not used because they did not meet the sample criteria. So, a total of one hundred and thirty-nine (139) questionnaires could be used. The demographic characteristics of the respondents are summarized in Table 1. The majority hold high-level managerial positions, with 37 % holding middle-level management positions and 54 % holding upper-level management positions. Therefore, it is natural that the informants have sufficient knowledge to fill out the questionnaire. The research sample was selected based on the criteria as described in the table.

Table 1. Demographic Characteristics of Respondents

Gender		Indusries	
Men	69%	Finance	72%
Woman	31%	Manufacturer	28%
Age		Job Title	
25-35 Years	6%	Front line Manager	9%
36-45 Years	52%	Middle level Manager	54%
Above 45 Years	42%	Top level Manager	37%
Education			
Bachelor Degree	66%		
Master Degree	32%		
Doctoral	2%		

Source: Elaborated by the authors.

### Operational Definition and Variable Measurement

In this study, the questionnaire was set in closed questions. Each question provides five alternative answers in a weighted score. Score levels were calculated using a 5-point Likert scale, with one (1) representing strongly disagree and five (5) representing strongly agree. The measurement of sustainability innovation variables adopted (Hermundsdottir & Aspelund, 2021) from the product, process and managerial aspects using six (6) question items. Meanwhile, measurable organizational learning adopted (Öztürk et al., 2016), with ten indicators which include Supportive firm structure, Effective work environment, Effective competing strategy, Growth-aligned vision, Trust at all levels in firm, effective operational procedures, Innovative firm culture, robust firm strategies, Continuously developing system, and Effective knowledge management. For the competitive advantage measurement variable, adopting (Hermundsdottir & Aspelund, 2021) uses three indicators: increased value creation, Reduced Cost, and Non-Financial Assets. Moreover finally, the company's performance measurement was adopted (Öztürk et al., 2016) using four indicators: financial success, Satisfied staff, Satisfied clients, and Confidence in future performance. The measurement of variables in this study is described in the following table:

### Data Analysis Technique

We used multiple regressions analysis to test the hypotheses. Smart PLS is applied as a statistics software. To prove that there is an effect of sustainability innovation, organizational learning on the performance of companies with a competitive advantage as moderating will be tested with a regression model with an absolute difference value test with the following equation:

$$FP = \alpha + \beta_1 SI + \beta_2 OL + \beta_3 CA + \beta_4 CA * SI + \beta_5 CA * OL + e \quad (1)$$

Explanation:

FP	: Firm Performance
SI	: Sustainability Innovation
OL	: Organizational Learning
CA	: Competitive Advantage
e	: error

### Result and Discussion

#### Descriptive Statistics

Table 2 below presents descriptive statistics that explain the value of the standard deviation of Sustainability Innovation, organizational learning, competitive advantage and firm performance, all of which have values lower than the mean, which means that the level of diversity and or the level of data distribution for this variable is low. The average respondent's assessment of the Sustainability Innovation variable as a whole is in the high category, which is 5331, meaning that management that has sustainability innovation can or supports the company's performance. The average respondent's assessment of the Organizational Learning variable is in the high category, which is 5,277, meaning that management who has company knowledge to provide experience to the company can support the company's performance. The average respondent's assessment of the Competitive Advantage variable as a whole is in the high category, which is 5,165, meaning the factors or attributes that allow certain companies to produce services or products that are more affordable or have higher quality than their competitors. The average respondent's

assessment of the Firm Performance variable as a whole is in the high category, which is 5.085, meaning that the company's performance is influenced by management that adopts the variables of Sustainability Innovation, Organizational Learning and Competitive Advantage.

Table 2. Descriptive statistics

Variable	Missing	Mean	Median	Min	Max	Standard Deviation	category
SI	0	5.331	5	3	6	0.760	High
OL	0	5.277	5	2	6	0.821	High
CA	0	5.165	5	1	6	0.910	High
FP	0	5.085	5	3	6	0.905	High

Source: Elaborated by the authors.

According to Table 3 below, all indicator loads are above the threshold value, CR values range from 0.932 to 1, and AVE values range from 0.697 to 1. As a result, all three conditions of convergent validity are met. In addition, all Cronbach's alpha indicator values must be greater than the allowable value of 0.7, and all of our measurement items presented in Table 2 are more significant than 0.7.

Table 3. Reliability and Validity

Variable	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Competitive Advantage (CA)	0.912	0.928	0.932	0.697
Firm Performance (FP)	0.916	0.924	0.938	0.751
Moderating (OL)	1.000	1.000	1.000	1.000
Moderating (SI)	1000	1000	1000	1.000
Organizational Learning (OL)	0.941	0.948	0.952	0.740
Sustainability Innovation (SI)	0.927	0.936	0.940	0.735

Source: Elaborated by the authors.

After checking the quality of the structural equations, and the next step is to investigate the relationship between x constructions. Evaluation of the structural model is to see the relationship between the constructs. The evaluation uses the coefficient of determination (R - square). The coefficient of determination is indicated by the value of R-square ( $R^2$ ), which serves to measure the degree of variance of changes caused by the independent variable on the dependent variable. The greater the R-square value, the better the prediction model of the proposed research model. In this case, the higher the R-square or the closer to one, the better the model. The results of the study obtained  $R^2$  value of 0.638 and the adjusted value of 0.626, as shown in table 4. The indication is the contribution of the variables of

sustainability innovations, organizational learning, and Competitive Advantage to Firm Performance of 62.6%, and 37.4% is the contribution of unexamined variables.

Table 4. Determination coefficient

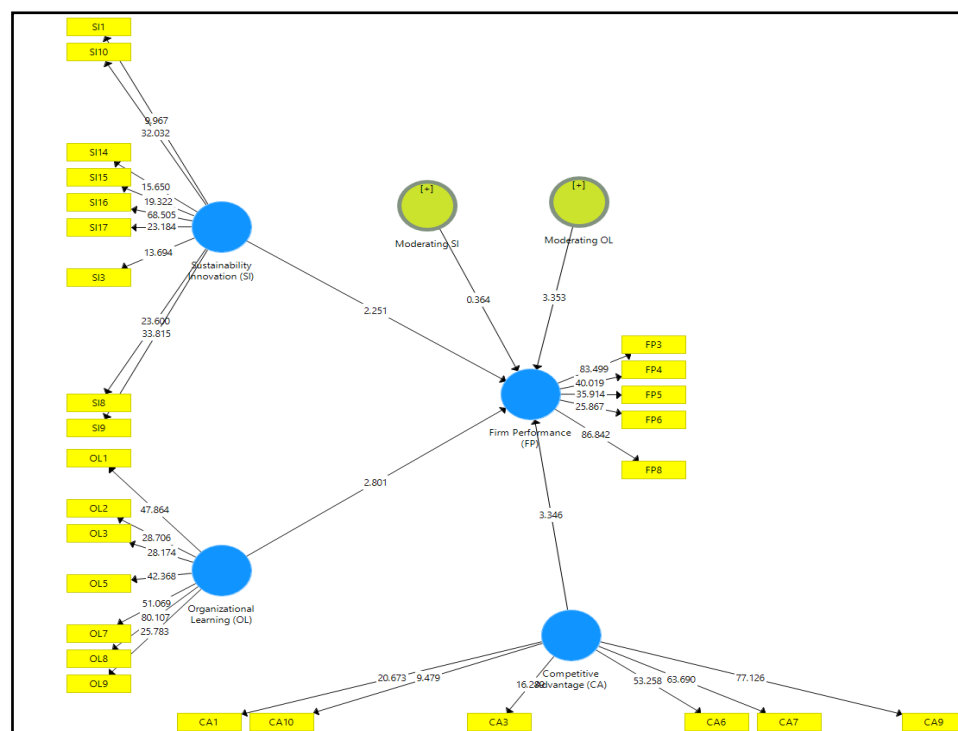
Dependen Variable	R Square	R Square Adjusted
Firm Performance (FP)	0.638	0.626

Source: Elaborated by the authors.

### Hypothesis Testing

The hypotheses H1 to H5, described by the path coefficients and their significance level, are shown in Figure 1 and Table 4. The analysis results support the hypothesis H1, H2, H3, and H5 but do not support H4. The output of the Hypothesis Testing results in table 4.9 shows that Hypothesis 1 is accepted where the relationship between SI and FP is significant with a T-statistic of 3.283 (> 1.96). The estimated value of the original sample was positive (0.249), indicating the positive direction of the relationship between SI and FP. The second hypothesis is also accepted. There is a positive effect between OL on FP, as indicated by the estimated value of the original sample of 0.392 and the T-statistic of 3.052 (> 1.96). In the third hypothesis, the T-statistical value of 3.507 (> 1.96) with a positive direction of 0.388 indicates a significant positive relationship between CA and FP, which means that the third hypothesis is accepted. In the fourth hypothesis, there is a positive but not significant effect between SI and FP moderated by CA with a T-statistical value of 3.345 (> 1.96) and a p-value of 0.730, so the fourth hypothesis is rejected. In the fifth hypothesis, there is a positive and significant effect between OL and FP moderated by CA where the T-statistic value is 3.283 (> 1.96) and p-values 0.01.

Figure 1. Results Model



Source: Elaborated by the authors.

Table 5. Hypothesis Testing

Hipotesis	Independen	Dependen	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ( O/STDEV )	P Values
H1	SI	FP	0.221	0.231	0.099	2.236	0.026
H2	OL	FP	0.392	0.376	0.128	3.052	0.002
H3	CA	FP	0.388	0.393	0.111	3.507	0.000
H4	SI*CA	FP	0.020	0.026	0.059	0.345	0.730
H5	OL*CA	FP	0.249	0.246	0.076	3.283	0.001

Source: Elaborated by the authors.

## Conclusion

This study aims to explore the impact of sustainability innovations (SI) and organizational learning (OL) on firm performance (FP) through moderating competitive advantage (CA). Empirical findings show that, either directly or indirectly, sustainability innovations (SI) have a significant positive effect on firm performance (FP).

The results of the study prove that organizational learning affects company performance. Companies continue to increase their resources in conducting organizational learning because organizational learning is the key to improving performance. In addition to learning organizations, entrepreneurship also affects the company's performance. This shows that the company continues to focus on increasing entrepreneurship by developing new products, new techniques and adopting a competitive attitude to improve performance continuously.

Based on the moderating factors explored in this study, future research could adopt, for example, case study or survey-based approaches to explore the required operations changes (e.g. construction process) to the performance improvement. Innovation is often seen as risky; an in-depth case study could provide additional insights into risk factors and approaches to manage these risk factors and also show the role of innovation creation vs adoption orientation as a factor in the model. Where we had no evidence for some of the relationships we hypothesized, a follow-up study might use a panel or interview process with industry experts to identify whether there are any additional moderating or mediating factors that would need to be incorporated into the model.

The results of this study provide several contributions to academics and the development of science because this study is expected to help advance the science of accounting, especially management accounting, which expands the study of the role of sustainability innovation and e-business to increase company competitiveness and at the same time improve company performance. As for the contribution to the regulator, this research hopes to be used as a reference in producing new regulations that support the company's sustainability innovation climate.

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