Do Performance Measurement Systems and Ethical Leadership Style Affect Sustainable Investment Decisions?
An Experimental Evidence

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Abstract: Management accounting is expected to be one of the significant tools to tackle environmental and sustainability issues. This study aims to fill the gap in the empirical results about the effect of performance measurement systems that include financial and sustainability indicators, one element of management accounting, on sustainable investment decisions. Additionally, this study examines whether ethical leadership plays a prominent role in that relationship. This study used an experimental method with 67 students majoring in accounting as participants. The data was collected online, where requirements for conducting an experimental study were fulfilled. The results of this study support the hypothesis that managers will be more likely to make sustainable investment decisions when their performance is evaluated using financial and sustainability performance measurements compared to that of financial performance measurement alone. Additionally, the effect is higher when their top managers perform high ethical leadership. The paper fills the gap in the literature about the effect of performance measurement and reward systems (PMRS) on sustainable investment decisions. This paper specifically gives direction for the business on how to react and take action amidst the sustainability era.

Keywords: Management Accounting, Performance Measurement Systems, Ethical Leadership, Sustainable Investment Decision

Abstrak—Akuntansi Manajemen diharapkan dapat menjadi salah satu alat signifikan dalam memecahkan isu-isu lingkungan dan berkelanjutan. Tujuan penelitian ini adalah mengisi senjangan empiris mengenai pengaruh sistem pengukuran kinerja yang mengikutkan baik indikator keuangan dan keberlanjutan, yang merupakan salah satu elemen dalam Akuntansi Manajemen, terhadap keputusan investasi berkelanjutan. Penelitian ini juga menguji apakah kepemimpinan etis memainkan peran penting dalam hubungan tersebut. Penelitian ini menggunakan metode eksperimen dengan 67 mahasiswa Program Studi Akuntansi sebagai partisipan. Data dikumpulkan menggunakan pendekatan online dengan tetap memenuhi semua persyaratan studi eksperimen. Hasil penelitian mendukung hipotesis yang diajukan, yaitu bahwa manajer akan memilih keputusan investasi yang berkelanjutan ketika kinerja mereka dievaluasi

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Kata Kunci: Akuntansi Manajemen, Sistem Pengukuran Kinerja, Kepemimpinan Eetis, Keputusan Investasi Berkelanjutan

1. Introduction

Human activities—including business activities and practices—can harm society and future generations' ecological and economic aspects (Unerman et al., 2008). They may also cause a catastrophic ecological situation (Ligonie, 2021). The environmental damage caused by business activities leads the stakeholders to demand that companies run their business more ethically by paying more attention to sustainability issues (Delmas and Toffel, 2008; Henriques & Sadorsky, 1999; Perez-Batres et al., 2012; Verbeke and Buysse, 2003). This explains why the growth of the research has also shifted from whether business organizations should engage in sustainability to how it can be achieved in practice (Searcy, 2012). One relevant practice where businesses can take part in achieving a long-term sustainable planet is by making sustainable investments (Schramade, 2017).

While the interests of the shareholders and stakeholders are not contradictory in the long run (Cook et al., 2023), the idea of incorporating the concept of sustainability in the business realm faces great challenges (Aust et al., 2020; Hopwood et al., 2010; Joshi & Li, 2016), such as large investment funds (Aust et al., 2020) with high and costly financial commitment (Berrone et al., 2013; Hoffmann et al., 2019). Moreover, whether this type of investment will pay off financially (Veldman & Gaalman, 2020) is still questionable. Therefore, the question creates uncertainty among managers about the outcomes of sustainable investments (Berrone & Gomez-Mejia, 2009). Solutions are
very much needed in the joint endeavor to overcome these challenges, including from the accounting side.

Accounting as part of the business plays a key role in helping organizations to develop a more sustainable business (Hopwood et al., 2010; Bebbington & Thomson, 2013; Endenich & Trapp, 2020; Indriastuti & Mutamimah, 2023). Management accounting suggests that to accommodate the challenges described above, businesses are required to change their existing control systems (Huber & Hirsch, 2017), including the performance measurement and reward systems (PMRS) (Berrone et al., 2013; Rosanas & Velilla, 2005; Staniškis & Arbačiauskas, 2009). Previous studies indicate that PMRS has a big impact on internal decision-making, including on sustainable investment decisions (Bento et al., 2019; Garcia et al., 2016; Masocha, 2018; Nicoletti Junior et al., 2018; Searcy, 2012; Staniškis & Arbačiauskas, 2009). This is not surprising since the tools to control sustainability practices can shape managers' behavior and help them in decision-making (Ligonie, 2021).

The research incorporating the sustainability criteria in managerial PMRS, however, is sparse even though the topic of sustainability issue has emerged in the last few decades (Berrone et al., 2013; Berrone & Gomez-Mejia, 2009; Huber & Hirsch, 2017; Ligonie, 2021; Searcy, 2012; Songini & Pistoni, 2012; Veldman & Gaalman, 2020), especially on the relationship between PMRS and sustainability investment decision or any investment that support the Sustainability Development Goals (SDGs). This study aims to fill this gap by empirically testing the effect of sustainability PMRS usage and financial ones on sustainable investment behavior using attribution theory. While previous studies show that attribution theory can explain how the human-made attribution of cause and effect may have a significant impact on their judgment and, thus, behavior (Heider, 1958; Schiff & Hoffman, 1996a; Weiner, 1972), it has not been tested in the context of PMRS and sustainable investment.

Furthermore, to strengthen the control of the managers' behavior and, hence, the decision-making process regarding sustainability investment decisions, the company should have a leadership style that aligns with the strategic performance measures (Virtanen et al., 2013). Leadership is powerful, and it becomes one of the significant
factors that greatly impacts employees' state of mind (Philipp & Lopez, 2013). Leaders' credibility, attractiveness, power, status, and role expectations made their subordinates follow and respect them as role models (Brown & Treviño, 2006; Paterson & Huang, 2019; Widhiastuti et al., 2020).

Previous studies encourage academics to find what style of leadership fits the endeavor to drive the managers' behavior to always put sustainability into consideration (Bebbington & Unerman, 2018; Broman et al., 2017; Nicholson & Kurucz, 2019), especially the leadership style of top managers (Brown and Treviño, 2006; Eisenbeiss & van Knippenberg, 2015; Ko et al., 2017). Prior studies show there are many leadership styles. However, not all styles fit the need to shape subordinates' engagement to work on sustainable development. Ethical leadership was found to significantly affect the ethical behavior of subordinates, including sustainable investment decisions (Ilyas et al., 2020). To elaborate on this, we examine the effect of top managers' leadership style on the relationship between PMRS and sustainable investment behavior using social learning theory. This theory explains how people can learn the behavior of others and adopt them as their own (Brown & Treviño, 2006; Nabavi, 2016). Hence, the novelty of this study is to provide empirical evidence on whether the use of sustainability indicators in PMRS affects the sustainability investment decision and whether ethical leadership plays a prominent role in that relationship.

To investigate the issues, we used the experimental method with 67 undergraduate students majoring in accounting as participants and analyzed the collected data using ANOVA. We found that PMRS, which incorporates sustainability measures, leads managers to make sustainable investment decisions. This study supports previous literature, which argues that management compensation schemes are pertinent in affecting investment decisions related to sustainability issues (Narayanan et al., 2020). Additionally, we found that the effect is higher when their top managers perform high ethical leadership. This study enriches the literature regarding leadership and sustainability, as there are very limited studies on the role of leadership in sustainability literature (Metcalf & Benn, 2013). The study, however, should be read cautiously as it
contains some limitations, such as the experiment being performed online and using students as subjects.

The rest of the paper is organized as follows. The next section is the theoretical framework and hypothesis development. This will be followed by the research method in section three and the results and discussion in section four. The paper ends with conclusions, implications, and limitations.

2. Theoretical Framework and Hypothesis Development

2.1. Sustainability and Sustainable Investment Decision

The terms ‘sustainable’ and ‘sustainability’ began to be known widely after the publication of the Brundtland Report, also called "Our Common Future" (World Commission on Environment and Development, 1987). This concept was then developed into what we know today as “Sustainable Development” (Bebbington & Unerman, 2018). In the eyes of business organizations and investors, sustainability means the capacity to create, test, and maintain adaptive capability (Holling, 2001). Meanwhile, Schramade (2017) defines sustainability as a process of creating and investing in a corporate capacity for system change and holistic thinking.

In 2015, the UN again called on the need to participate in the common agenda to make a sustainable world through its publication, “Transforming Our World: The 2030 Agenda for Sustainable Development”. This agenda covers five important things that need to be thought about: humans, earth, wealth, peace, and working together (United Nations, 2015), which can be mapped into 17 Goals called Sustainable Development Goals (SDGs). However, realizing these goals will require considerable investment funds (Aust et al., 2020), around US$5 trillion - US$7 trillion (United Nations Conference on Trade and Development, 2014). This amount is nearly impossible to be provided merely from the public sector. Therefore, it is predicted that business organizations have the ability and the peculiar strength to realize SDGs through various investments (Hsiao et al., 2019; Inter-agency Task Force on Financing for Development, 2019; Scheyvens et al., 2016).
Some reasons support the management's decision to participate in sustainable investment (Schramade, 2017). First, this investment benefits society. Through sustainable investment, the company gets a chance to create the world as a better place to live and, thus, a better place to conduct its business. Second, companies that invest in this issue will have a better position in the future, both competitively and environmentally.

Sustainable investment, however, suffers some drawbacks for the business, such as: 1) Longer time for companies to benefit from financial returns (Berrone & Gomez-Mejia, 2009; Inter-agency Task Force on Financing for Development, 2019; Lewis and Juravle, 2010), which is usually more than five years (de Souza Cunha & Samanez, 2013), or even decades (Wu & Pagell, 2011); 2) The risk that the company has to bear (Berrone & Gomez-Mejia, 2009) due to uncertain returns (Kawai et al., 2018). Any innovations which target the environmental sustainability aspect also do not automatically make the company’s profitability better (Dick et al., 2008; Lo et al., 2011); 3) The good impact of sustainable investment on the returns is still uncertain (Joshi & Li, 2016) and questionable (Veldman & Gaalman, 2020). These drawbacks create tension since the managers still prioritize economic outcomes in making investment decisions, including investments, to overcome sustainability issues (Narayanan et al., 2020). Thus, these stereotypes may potentially lessen the attractiveness of reaching such investment decisions (de Souza Cunha & Samanez, 2013), while the available financial resources now are still far under the need (Inter-agency Task Force on Financing for Development, 2019).

2.2. Performance Measurement and Reward Systems

Performance measurement and reward systems (PMRS) are tools to manage performance that are designed following the organization structure and the responsibility line of the managers’ decision-making (Songini & Pistoni, 2012; Virtanen et al., 2013). It is used to motivate managers to make decisions that will benefit both the company and themselves (Franklin et al., 2019). The PMRS is one of the greatest systems that make a business sustainable (Kerr & Slocum, 2005). Therefore, it is important to ascertain whether the PMRS used are the correct performance metrics to
correctly show the manager's performance. Suppose the component of the system is not correct. In that case, it will make the managers focus and endeavor only on the organization's short-term achievement or even make decisions that lead to personal achievement rather than the organization's (Franklin et al., 2019).

In the past, performance measurement systems rely heavily on financial metrics due to their availability, simplicity, and ease of use (Franklin et al., 2019). However, previous studies show that financial indicators alone are insufficient to evaluate managerial performance (Atkinson et al., 2012; Fiorentino, 2010; Franklin et al., 2019; Gosselin, 2011; Selto et al., 1995). This raises awareness, especially when a company needs to incorporate sustainability into its business activities. The use of only financial metrics is not relevant and sufficient anymore for the dynamic of business activities in this 21st century (Atkinson et al., 2012).

Following those critics over the exclusive use of financial indicators, this concept gradually changes into using financial and non-financial indicators as a set of contemporary performance measurement systems (Choong, 2014; Franco-Santos et al., 2012). Companies begin to see that the use of non-financial performance measurement to complete the financial performance measurement can help the companies create values for all stakeholders that cannot be articulated merely through the accounting numbers (Ittner et al., 2003). It is also necessary to note that using accounting and non-accounting-based controls ensures that the employees' behavior and decisions align with the organization's objectives and strategies (Malmi & Brown, 2008). In the context of the sustainability issue, the need to use the non-financial performance evaluation increases to meet both shareholders' and stakeholders' demands (Hopwood et al., 2010).

There has been a growing interest in financial and non-financial PMRS for the past two decades, especially on the Balanced Scorecard (Kaplan and Norton, 1992). One prominent non-financial performance indicator related to sustainability is the Sustainability Balanced Scorecard (SBSC) (Hahn & Figge, 2018; Hansen & Schaltegger, 2016; Jassem et al., 2018; Journeault, 2016). On a higher level, the use of non-financial indicators has also been noted by the United Nations to reach the objective of SDGs (Raucci & Tarquinio, 2020; UNSD, 2019).
2.3 Ethical Leadership

Business scandals, like Enron, Arthur Andersen, and Worldcom cases, inspire accounting scholars to prevent such unethical practices in conducting business. Brown et al. (2005) ignite the topic that connects leadership and business ethics. They define ethical leadership by emphasizing moral management and moral individuality (Brown & Treviño 2006). Meanwhile, Demirtas (2015) defines ethical leadership as the leaders' attitude, talk, and behavior, which contains proper norms. Thus, ethical leadership involves the role of ethical leaders.

Leaders substantially affect the employees due to their representation of their organizations (Moore et al., 2019), who actualize their characteristics and behavior in their real personal lives (Ko et al., 2017). Ethical leadership was found to be able to reduce employees' bad behavior (Demirtas, 2015) because an ethical leader can make employees put their concerns toward anything ethical (Reynolds, 2008).

As sustainability and corporate social responsibility issues arise, the empirical study examines how ethical leadership affects the company's commitment to participate in sustainability issues. Clarkson (1991) argues that leaders must direct moral responsibility to shareholders and all stakeholders. Metcalf and Benn (2013) also argue that leaders and leadership are the main connectors between the company's commitment to engage in sustainability issues and the wider system where the company exists. Ethical leadership becomes one of the few leadership styles with essential principles of responsibility and sustainability orientation (Eisenbeiss, 2012) and concern toward society, future generations, and the environment (Shakeel et al., 2019).

2.4 Hypothesis Development

2.4.1 Performance Measurement Systems and Sustainable Investment

We derive our hypothesis based on attribution theory. This theory argues how an individual tends to look for the cause of a certain behavior, either theirs or others’ (Heider, 1958). Attribution theory was developed based on arguments that attribution of the reasons for performance achievement impacts an individual's motivation and behavior afterward (Weiner, 1972). In a business context, these reasons motivate the
managers to achieve the company's expected performance (Heider, 1958; Schiff & Hoffman, 1996b).

The attribution factor about using certain PMRS explains why employees are concerned with the performance evaluation process, including the measures used to evaluate their performance (Lau & Sholihin, 2005). The use of PMRS will become the attribution that leads them to the interpretation of the most important thing to achieve in the eye of the company. This interpretation makes the managers concentrate only on what is being measured (Lisi, 2015; Virtanen et al., 2013). Therefore, if a manager does not find the attribution of their decision, the manager will experience demotivation to execute it. Thus, the company needs to control the attributions made by the employees since they create an intention that will affect employees' behavior in the future (Huber & Hirsch, 2017).

Regarding the sustainability issue, Hopwood et al. (2010) called out the urgency of using non-financial performance indicators, particularly social and environmental indicators. The systems that include non-financial performance indicators change the conventional judgment which argues that financial performance should become their uppermost priority compared to any other performance (Kerr & Slocum, 2005) or that there must be a trade-off in making investments related to sustainability issues (Narayanan et al., 2020). These dual systems help managers break out of the stereotype of focusing solely on financial performance, considering that not all managers have personal motivation or concern about sustainability issues (Franklin et al., 2019). Therefore, the systems can make them comfortable enough to sit and consider this issue because it catches employees' attraction, motivation, and cooperation on sustainability issues (Huber & Hirsch, 2017). It will become their attribution, which impacts their decision regarding sustainable investment.

The managers will likely make sustainable investment decisions if the company uses the sustainability performance measurement and the financial performance measurement in the same manner. This is because anticipating positive rewards encourages managers to invest in sustainability (Veldman & Gaalman, 2020). Using the dual systems makes it clear to the managers that sustainability performance is as
important as financial performance because its design aligns with the organizational structure and the responsibility of the decisions everyone makes (Virtanen et al., 2013). Hence, the systems do not merely show what gets measured and done but more about how the systems can incentivize the managers to decide on behalf of the stakeholders despite the merits of this investment that may not be paid off for decades (Wu & Pagell, 2011).

**H1**: Managers will be more likely to perform sustainable investment decisions when their performance is evaluated using financial and sustainability performance measurements compared to that evaluated using the financial performance measurement alone.

### 2.4.2. Ethical Leadership and Sustainable Investment Decision

Top managers become a role model that stands out in the eyes of their subordinate managers due to their power and status as the highest leader and their representation as the key models for normative and appropriate behavior (Brown & Treviño, 2006; Moore et al., 2019). Each subordinate manager learns which behavior is appropriate or inappropriate by looking up to the top managers as their role models (Bandura, 1971). Therefore, top managers should behave as appropriate role models that set a good example for their subordinates. They should be concerned about any ethical issues from their behavior. Therefore, ethical leadership, first introduced by Brown et al. (2005), cannot be separated from the role of ethical top leaders.

Prior studies show that ethical leadership is one of the factors which has been shown to affect employee’s ethical performance (Brown & Treviño, 2006), including maintaining sustainability (Endenich & Trapp, 2020; Hoffmann et al., 2019; de Souza Cunha & Samanez, 2013) because the heart of sustainable actions is ethics and values (Grayson, 2019). Acting unsustainably will seriously lessen the quality of life for future generations and worsen the planet (Brown, 2001), which is considered unethical. Top managers typically cascade the management decisions on sustainability down in the organization to be responsive to local issues because the sustainability impacts are often local (Epstein, 2010). Therefore, top managers’ support is critical in encouraging the sustainable investment decisions made by subordinates, especially when they
receive a demand to make a trade-off between social and environmental performance versus financial performance. In other words, the commitment to solving the sustainability issue will rely heavily on how ethical the leadership is since it is the foundation that drives all efforts. This reasoning leads us to argue that it will be easier to drive the managers’ desire to go for sustainable investment decisions if high ethical leadership is applied within the organization.

**H2:** The managers will be more likely to perform sustainable investment decisions if their top managers perform high ethical leadership compared to low ethical leadership.

2.4.3. **Performance Measurement Systems, Ethical Leadership, and Sustainable Investment Decision**

As discussed, a highly ethical leader will set clear ethical standards. This leadership style supports moral reasoning and shows the main normative and appropriate behavior among subordinates (Brown & Treviño, 2006; Lu and Lin, 2014; Moore et al., 2019). These virtues in ethical leadership style are also exhibited in conducting any control to respond to sustainability issues.

Prior literature shows that leaders' sense of duty and concern for sustainability are found to link most strongly with ethical leadership (Metcalf & Benn, 2013). It explains why top managers with a high ethical leadership style are also concerned about environmental sustainability issues, including how the control tools of sustainability work (Ligonie, 2021). Hence, ethical leadership becomes the foundation of direct sustainability control (Tushar, 2017), which in this study is presented as sustainability PMRS. The more ethical the leadership, the stronger the effect of sustainability PMRS on sustainable investment decisions. It indicates that the effect of managers' attribution about the use of sustainability PMRS on the decision to make sustainable investment will rely heavily on how ethical the leadership performed by the top managers.

**H3:** Ethical leadership that the top managers perform moderates the effect of financial and sustainability performance measurement on sustainable investment decisions in a way that higher ethical leadership will more likely drive subordinate managers toward sustainable investment decisions compared to low ethical leadership.
3. Research Method

3.1. Research Design and Participants

This study used a laboratory experiment with a design of 2x2 between-subject. This method was used due to its high-level characteristics that allowed the researchers to control all the relevant variables. Each participant received two treatments: performance measurement systems and ethical leadership. Every treatment was divided into two different levels. The treatment for the performance measurement systems was divided into financial performance measurement (FP) and financial and sustainability performance measurement (FS).

Meanwhile, the treatment for ethical leadership was divided into low ethical leadership (LEL) and high ethical leadership (HEL). This high vs. low treatment type is also used in various accounting studies with experimental methods as their research design (Agustina et al., 2022; Rohma & Novitasari, 2023; Mareta et al., 2021). The participants received one treatment for performance measurement systems and one for ethical leadership. Therefore, each participant will be put into one of the following groups: 1) FP – HEL; 2) FS – HEL; 3) FP – LEL; 4) FS – LEL.

The participants of this study were senior undergraduate accounting students as the surrogates for managers. Previous studies show that students can surrogate the investment decision-makers (Madein & Sholihin, 2015; Liyanarachchi & Milne, 2005;
Rutledge & Karim, 1999) and provide no greater threat to external validity than real managers (Walters-York & Curatola, 2000). In addition, literature in psychology shows that an undergraduate student can process the information they get in the same way as professionals (Nahartyo & Utami, 2016).

The students participating in this study must have passed three subjects: management accounting, financial management, and accountant professional ethics. These requirements are compulsory so that they understand well the treatments that are articulated in the questionnaire. We offered incentives to appreciate their participation in this study and to level their motivation to complete and whole-heartedly finish the questionnaire (Nahartyo, 2012; Nahartyo and Utami, 2016).

3.2. Experiment Procedures and Case Material

Due to the Covid-19 pandemic, this experimental study was conducted online. First, the link was shared with the participants. After they clicked the link, the participants would be brought to one of the four groups mentioned above. The randomization process required in the true experimental method was also performed. To encourage the participants as well as to maintain research ethics, we state on the first page of the instruments that the data is kept confidential. Moreover, we did not ask for any identity, like the participant's name or phone number.

The instrument begins by asking the participants to imagine themselves as an employee who have just been promoted to manager. Their first job as managers is to consider the sustainable investment that had been initiated by the former manager a few years ago due to the poor sustainability performance of the company. This investment had an estimated useful life of 7 years. The report shows the actual and projected financial performance results three years after the investment. The financial performance indicator did not perform well, while the sustainability performance was very well compared to the days before they began the project. The top managers delegated the investment evaluation decision to the participant as the new manager, who had to decide whether to continue or discontinue the investment. They were asked to circle a number from 1 to 10 to indicate their decision. Number 1 indicates that they want to discontinue the investment, while number 10 shows they want to continue the
investment. Investment measurement using this method was also done by Rutledge and Karim (1999).

Rutledge and Karim (1999) and Chan and Milne (1999) developed the sustainable investment decision variable to evaluate an investment decision using financial and non-financial information. The financial performance measurement manipulation used the instrument that Rutledge and Karim (1999) and Chan and Milne (1999) adopted. Meanwhile, the sustainability performance measurement manipulation used the instrument we derived from Wang (2019), which provides information in qualitative and quantitative formats. The instrument for ethical leadership as the moderating variable was developed from several studies (Moore et al., 2019; Stouten et al., 2013). This variable was translated into a greeting email from the top managers to the managers about the new position. The email shows how the top managers own an ethical leadership style.

4. Results and Discussion

To ensure the validity of our instrument, we conducted a pilot study using 20 participants. They were all accounting students in the final year of their studies. We conducted this pilot study using the same online provider used for the larger study. The result from this pilot study indicated that the instruments used in this study were well understood by the participants but needed minor revision.

After the revision, we conducted a larger study involving university students. Sixty-seven students showed up as participants. While there is no requirement for a minimum number of participants to participate in social research, the number of participants in each group should not be too small (e.g., less than ten persons) as well as there is no significant difference in the number of participants in each group (Nahartyo & Utami, 2016). This study met those requirements. The participants were dominated by females (75%), while the rest were male. Other collected data was the amount of their allowance/income per month; 69% of them are below IDR 2,500,000 (around US$167). All participants were undergraduate students from four big universities in Indonesia who were in their final year and had already passed the
subjects management accounting, financial management, and accountant professional ethics. Based on the confirmation, they rarely joined the laboratory experimental study; hence, we are not concerned with participant bias and the demand effect. The participant bias and demand effect can emerge from a person who too often joins as a participant in experimental research (Nahartyo, 2012).

Table 1
Descriptive Statistics

<table>
<thead>
<tr>
<th>Performance Measurement and Reward Systems</th>
<th>Ethical Leadership</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Financial Performance Indicator</td>
<td>FP-HEL</td>
<td>FP-HEL</td>
</tr>
<tr>
<td>Mean</td>
<td>7.00</td>
<td>Mean</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>1.862</td>
<td>Standard Deviation</td>
</tr>
<tr>
<td>N = 16</td>
<td></td>
<td>N = 15</td>
</tr>
<tr>
<td>Financial and Sustainability Performance Indicators</td>
<td>FS-HEL</td>
<td>FS-HEL</td>
</tr>
<tr>
<td>Mean</td>
<td>7.50</td>
<td>Mean</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>1.100</td>
<td>Standard Deviation</td>
</tr>
<tr>
<td>N = 20</td>
<td></td>
<td>N = 16</td>
</tr>
<tr>
<td>Total</td>
<td>Mean 7.28</td>
<td>Mean 4.81</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>1.485</td>
<td>Standard Deviation</td>
</tr>
<tr>
<td>N = 36</td>
<td></td>
<td>N = 31</td>
</tr>
</tbody>
</table>

Table 1 shows the descriptive statistics of each group. It shows that the mean investment evaluation decisions of participants put into the financial and sustainability performance indicator group are higher than those put into only the financial
performance indicator group. The scores for those two groups are 6.81 and 5.35, respectively. Moreover, the score of the participants who received high ethical leadership treatment is also higher, 7.28, compared to the participants who received low ethical leadership, which is only 4.81. According to the measurement scale, the higher the number they choose from 1 – 10, the more likely they are to take sustainable investment. Table 1 shows that the participants who received financial and sustainability performance measurement indicators and high ethical leadership treatments tended to take the sustainable investment compared to the other groups. Thus, it provides initial support for our hypotheses.

This study used Analysis of Variance (ANOVA) to examine the significant effect of the independent variable on the dependent variable (Nahartyo, 2012) and to detect the mean difference between experiment groups (Sawyer, 2009). This test showed whether there is any main effect of PMRS and ethical leadership on sustainable investment decisions, along with the possibility of the moderating role played by ethical leadership variables in affecting the relationship between PMRS and sustainable investment decisions. The table below shows the results of ANOVA:

Table 2.
Two-Way ANOVA Results

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>3</td>
<td>48.751</td>
<td>15.239</td>
<td>0.000</td>
</tr>
<tr>
<td>Intercept</td>
<td>1</td>
<td>2390.902</td>
<td>747.389</td>
<td>0.000</td>
</tr>
<tr>
<td>Performance Measurement Systems</td>
<td>1</td>
<td>33.316</td>
<td>10.415</td>
<td>0.002**</td>
</tr>
<tr>
<td>Ethical Leadership</td>
<td>1</td>
<td>101.902</td>
<td>31.854</td>
<td>0.000**</td>
</tr>
<tr>
<td>Performance Measurement x Ethical Leadership</td>
<td>1</td>
<td>13.971</td>
<td>4.367</td>
<td>0.041*</td>
</tr>
<tr>
<td>Error</td>
<td>63</td>
<td>3.199</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>67</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>66</td>
<td></td>
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<tr>
<td>Corrected Total</td>
<td>66</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

R Squared = 0.421 (Adjusted R Squared = 0.393)

Note: Significance at the 1% and 5% level is denoted by ** and *, respectively
Table 2 shows the main effect of each factor on the dependent variable. It can be concluded that both the PMRS (F=10.415; p<0.05) and ethical leadership (F=31.854; p<0.05) have a statistically significant effect on sustainable investment behavior. The results of the ANOVA test above show that the mean score difference between the groups is significant. This means that PMRS significantly affects sustainable investment decisions and ethical leadership. Thus, H1 and H2 are supported.

Next, we test the moderating effect of ethical leadership on the relationship between PMRS and sustainable investment decisions. Table 2 shows that ethical leadership indeed moderates the relationship mentioned (F=4.367; p<0.05) in a way that ethical leadership strengthens the positive effect of performance measurement systems on the intention of the managers to perform the sustainable investment. Thus, H3 is supported. In other words, the success of the performance measurement systems used in a company will increase when the top managers perform ethical leadership.

5. Conclusion, Implication, and Limitations

5.1. Conclusion

This study investigates the effect of PMRS, including financial and sustainability indicators, on sustainable investment decisions. Further, this study examines whether ethical leadership plays a prominent role in that relationship. Drawn from attribution theory and social learning theory, the results of this study confirm all predictions stated in the hypotheses. Managers will be more likely to make a sustainable investment decision when evaluated using financial and sustainability PMRS compared to financial performance alone. This study confirms that PMRS are the attribution factors for managers when making decisions. It supports Epstein and Widener’s (2010) contention that one of the purposes of performance measurement systems is to facilitate the decision-maker.

The performance measurement systems, which incorporate both financial and sustainability indicators, will generate the interpretation of the managers about what is truly the company's concern and motivation that is supposed to be delivered through their decisions. This interpretation makes the managers focus only on what is measured
(Lisi, 2015; Virtanen et al., 2013). In other words, if the company measures the managers' performance using financial and sustainability indicators, the managers will understand that the two performances are equally important in the eyes of the company. This is why PMRS, which includes the sustainability criteria system, becomes an essential key for a company that wants to commit to solving sustainability issues (Searcy, 2012; Songini & Pistoni, 2012) and is essential for any company to exist nowadays.

On the other hand, the results of this study do not validate some previous works that argue that PMRS can destroy intrinsic motivation and drive the behavior to be unethical and dysfunctional (Cugueró-Escofet & Rosanas, 2017; Franklin et al., 2019; Rosanas & Velilla, 2005; Ryan & Deci, 2000; Virtanen et al., 2013). Even though the PMRS may have shortcomings, it is still necessary to lead the managers' behavior. The total absence of sustainability performance measurement in this formal system may even be extremely dangerous (Rosanas & Velilla, 2005).

While the performance measurement as a mechanism of the management control system must change to put forward the sustainability concept, the focus of leadership also needs to be changed (Ilyas et al., 2020). It even demands extraordinary abilities of the leaders (Metcalf & Benn, 2013). Previous studies have been throwing questions about what leadership makes the top managers enhance the level of sustainability in business activities (Broman et al., 2017; Nicholson & Kurucz, 2019). Using social learning theory, this study answers these questions by showing that ethical leadership indeed plays an important role as a moderator in affecting the relationship between performance measurement systems and sustainable investment decisions. The top managers are the role models whom the subordinates respect due to their credibility, attractiveness, power, status, and role expectations (Brown & Treviño, 2006; Paterson & Huang, 2019). Therefore, their leadership mirrors the orientation and values upheld by the top managers. The more ethical the leadership, the more likely the subordinates behave ethically.

Our study shows that the decision-making process that considers the sustainability concept will require a change in the management control system and the leadership
Companies should no longer place emphasis only on profits but also on people and the planet. Incorporating this concept will demand high financial commitment (Berrone et al., 2013), a longer period (Inter-agency Task Force on Financing for Development, 2019; Lewis & Juravle, 2010), along with great investment funds (Aust et al., 2020). Thus, managers need to be motivated through leadership that inspires them to run the business more sustainably, as well as by implementing incentives that are aligned with strategic performance measures (Virtanen et al., 2013).

In addition, this study provides evidence of an interaction between inside and outside factors of individuals that affect sustainable investment decisions. In our study, the factor from the inside is the attribution made by the individual, while from the outside is the ethical leadership applied in the organization. Drawn from the results of this study, we suggest companies own control of the attribution of the managers in charge, as well as the leadership style, so their behavior and decisions reflect the value upheld by the companies (Malmi & Brown, 2008). Performance measurement as part of the management control systems is prominent to guard against the possibility that people will do something the organization does not want them to do or fail to do something they should do (Merchant & Van der Stede, 2017; Rosanas & Velilla, 2005).

This study gives implications both for management accounting and business literature. The result widens the literature about the PMRS that can be used to boost sustainable investment in solving the sustainability issue. Our findings support the prediction made in the previous studies that management accounting, especially the financial and sustainability PMRS (Bebbington & Thomson, 2013; Chenhall & Langfield-Smith, 1998; Franco-Santos et al., 2012; Staniškis & Arbačiauskas, 2009), play a big role in implementing sustainable investment (Albelda, 2011; Bebbington & Thomson, 2013; Bebbington & Unerman, 2018; Bento et al., 2019; Endenich & Trapp, 2020; Reichelstein, 1997; Unerman & Chapman, 2014). This study becomes an oasis amidst the lack of empirical evidence regarding the role of management accounting, especially the performance measurement system, in leading sustainability behavior (Bebbington & Thomson, 2013; Staniškis & Arbačiauskas, 2009).
5.2. Limitations and Suggestions for Future Research

It is important to note that our research also has limitations. First, the online experiment method used to collect the data made the researchers unable to fully control the situation in which participants participated. While the randomization was performed, we could not control the situation surrounding the participants when they participated in the experiment. However, this method made the participant be treated closest to the real situation with what managers must do. Thus, the online method makes the external validation of laboratory experiment research higher and makes it possible to generalize the result (Reips, 2000). However, care should be taken on the limited ability to generalize. We made as much effort to ensure that the manipulation used in this study is valid, representative, and strong.

Based on the findings, future researchers may consider conducting a field-based study to strengthen this study's external validity and widen the literature on performance measurement systems, including the considerably scarce sustainability concept (Huber & Hirsch, 2017). Further study should also find the shortcomings of using both financial and sustainability PMRS as a control system mechanism, as well as the mitigation of these effects. Moreover, suppose the performance measurement systems are proven to play a big role in achieving sustainability. In that case, researchers should find other management accounting tools that reinforce awareness of organizational activities’ social and environmental consequences (Endenich & Trapp, 2020).

Reference


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