Lean and sustainable construction: link between the sustainability report disclosure and the impact on profitable opportunities for investors

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Abstract. Lean management in the construction sector is a company-driven movement to gain various advantages in running the business process. By implementing lean management, the company is simultaneously able to achieve multiple goals, such as profit maximization, while being able to eliminate non-value added activities and improve its environmental and social performance. To communicate these activities, the company issues a sustainability report, whose quality of disclosure depends on what the company has done with its business processes. This study tries to examine whether the quality of disclosures in sustainability reports has been able to contribute to influencing the number of earnings per share, which in this case is essential information for investors to see opportunities for profitability. The findings of this study indicate that, overall, disclosures in sustainability reports have not been a critical reference for investors, especially in looking at their profitability opportunities, and they only position this sustainability report as an additional source of information to ensure their concerns about social and environmental responsibility. The implication of this research for the development of sustainable construction is that it functions as a note to increase stakeholder engagement, especially investors, so that they appreciate the efforts of management to achieve competitive advantages and not only profit oriented.

1. Introduction
Lean management strategies have been carried out by many companies since a while ago, but they are still initiating the improvement process towards sustainability as a form of accountability for their business processes. The triple bottom line concept has brought the company's paradigm to be more responsible and begin to pay attention to various aspects outside of finance [1]. As a form of continuous improvement, lean management is considered a concept that can solve multiple problems related to efficiency and productivity, reduce the number of non-value-added activities, and make the organization thinner and more flexible [2].

Moreover, in some companies that have paid more attention to improving the quality of their supply chain management into the sustainability paradigm, this lean management concept is becoming more appropriate because it is very easily associated with an eco-efficiency approach, which has two sides of influence, namely reducing costs and contributing to environmental performance.
Although in purpose, the concept of the value and the concept of waste management between lean and sustainability are different [3], both lead to an increase in the value of the company. Lean management prioritizes efficiency and productivity factors derived from business calculations while sustainability places more emphasis on how they carry out the process more responsibly for stakeholders. In the world of construction, the sustainability paradigm will be more visible when lean management designs are simultaneously chosen and harmonized with the sustainability concept, where investments that enter the company have taken into account the support and selection for efforts to improve environmental performance [4], such as reducing the use of hazardous materials, saving energy, and implementing an integrated waste management.

In addition to the consideration of improving environmental performance, construction companies are motivated to make sustainability efforts due to business value reasons [5]. If they can obtain a certain business value (for example, in environmentally friendly buildings, rent or unit-selling prices will be higher), they will take the opportunity and harmonize with the value chain they do. That is, economic motivation will tend to be a driver for sustainability compared to motivation to improve environmental performance. In this case, we can say that improving environmental performance is possible if it also simultaneously creates opportunities for strengthening economic/financial performance.

The progress of the construction sector in adapting the concept of sustainability has been demonstrated in several previous empirical studies. They realize that action is urgently needed to improve the quality of project management flows towards sustainability [6] and make it a benchmark for success. Efforts to develop sustainability evaluation indicators in the construction sector are made by basing on economic, social, environmental aspects [7], as well as in detail, entering internal and external efficiency indicators [8]. Even in its development, previous empirical studies have been able to compile indicators to evaluate Project Management Practices and Sustainable Infrastructure (SI). To satisfy the aim of our research, we found that one of the drivers of improving environmental performance was eco-efficiency [6]; therefore, the results of this study also confirmed the statements in the previous paragraph.

The common thread of the above explanation is that the presence of sustainability performance is an effort initiated by management [9][6], in the form of both lean and supply chain management, and is not a request from investors [8][10]. Besides, the disclosure of sustainable business processes in sustainability reports is more motivated by fulfilling the element of legitimacy and fulfilling community expectations compared to achieving the substance of sustainability [11]. Based on the results of previous studies, there are quite basic questions, i.e. how much the need or attention of investors to the presence of a sustainability report is and whether the existence of sustainability efforts initiated by management can influence the indicators that are of concern to investors. This study aims at presenting empirical findings of the quality of disclosure of sustainability reports, especially in the construction industry in several countries, and showing the effect of exposure of sustainability reports prepared using the Global Reporting Initiative/GRI G4 guidelines on earnings per share (EPS) variables.

2. Sustainable Construction and information disclosure in corporate sustainability reporting
The construction sector is an essential sector in the economy and takes a significant portion in providing employment as well as making various economic, environmental, and other social contributions. In response to sustainability issues, multiple initiatives to present the concept of sustainable construction have been applied in empirical practice, one of which is by developing the idea of green construction [12]. The objectives of the implementation of sustainable construction include maximizing wealth, maximizing utilities, minimizing resources, and minimizing impacts [13]. To make this happen, companies have a great interest in delivering information, among others, by improving the quality of disclosure in the sustainability report. Even though it is not regulated as mandatory, the quality of disclosure is an important matter to note to emphasize the commitment of sustainability and the company's efforts to fulfill its commitments. Many standards can be selected to guide the preparation of sustainability reports, such as the Global Reporting Initiative (GRI) and the International Integrated Reporting Committee (IIRC). This study uses the GRI G4 standard explicitly as a guideline for assessing
the quality of disclosure of sustainability reports from construction companies selected as the research samples.

3. Information disclosure quality and Earning per Share

The existence of reporting that links sustainability implementation to financial parameters is currently becoming more prominent and transparent [14]. Besides, the information provided also has better quality, allowing various parties, including investors, to use sustainability reports as a profitability parameter for them. Investors are very interested in seeing how companies strive to be more profitable and more competitive whilst still considering stakeholders' interests more equitably. In addition, on the upstream side of production, the company is increasingly trying to be the best for its users while even taking into account various sustainability indicators.

The quality of disclosures in sustainability reports, especially economic indicators, is most often used to attract investors to the company. Investors easily find information related to financial performance and connect with expectations for profit, one of which is measured by the value of earnings per share / EPS. If the disclosure is following its expectations, investors will assume that the company is worthy of providing an opportunity for more profit. Thus, the first hypothesis (H1) is that the quality of disclosure of economic indicators affects the earnings per share / EPS. The better the disclosure of its financial indicators is, the better the internal business process is, making it able to promise higher profits.

On the other hand, the link between lean management and environmental performance is now increasingly connected because it is believed to be able to increase competitive advantage [15]. The slimmer a business process is, the more activities that are not value-added will be lost and replaced by increased productivity while accompanied by an increase in the prevention of environmental damage. Some of these advantages are very promising, particularly for investors, especially to create more opportunities to increase the value of their investments; hence, it can be assumed that more disclosures in the sustainability report about various production activities that are able to form environmental performance mean investors will be more interested because the company will be able to provide an ever increasing earnings value per share. Therefore, the second hypothesis (H2) of this study is that the quality of disclosure of environmental indicators influences earnings per share / EPS.

The popularity of socially responsible investment is also increasingly thought to be a motivator for companies to further improve their business processes according to the concept of sustainability. Although the results of previous studies related to the type of investors found that there were two motivations of investors when choosing the SRI instrument, namely finding opportunities to gain new financial benefits and avoiding environmental and social risks [16] [17], the tendency of investors to have other motivations cannot be ignored. Only does it appear in the type of investors who have more attention to the social implications that might arise from their investments in companies [18]. Based on the above phenomenon, the third hypothesis (H3) is that the quality of disclosure of social indicators influences earnings per share / EPS. The assumption built is that with the quality of disclosure of good social indicators in the accountability report, the company has made efforts to better mitigate social risk, allowing them to generate high profits, which impact on high EPS values.

4. Research Methods

The study we conducted aimed to observe the influence of the quality index of disclosure of sustainability reports in construction companies in several countries including Indonesia with the value of earnings per share (EPS) of the company's shares by compiling the index criteria as table 1.

In the first step, we conducted a content analysis on the quality of disclosures in the sustainability report and gave a score according to the specified index criteria. The population in this study was 28 construction companies in several countries, including Indonesia. Meanwhile, samples were taken through the purposive sampling method with construction companies that published their 2017 sustainability report as the sampling criteria.

We used a secondary data in the form of sustainability report during the period of 2017. The approach used was a direct approach, where the analysis starts from the theory and/or relevant research finding as
a guide in converting content into code [19]. Data sources were obtained from the official website of each company and the National Center for Sustainability Reporting (NCSR) website at www.ncsr-id.org. The companies as the samples of this study consist of 26 Indonesian, Asia, Europe, and New Zealand company.

| Score Index | Details |
|-------------|---------|
| 1           | Economic, environmental, and social indicators are fully disclosed according to the GRI G4 guidelines. |
| 2           | Economic, environmental, and social indicators are adequately disclosed according to the GRI G4 guidelines. |
| 3           | Economic, environmental, and social indicators are minimally disclosed according to the GRI G4 guidelines. |
| 4           | Economic, environmental, and social indicators are not disclosed. |

These samples were then searched for earnings per share (EPS), and the effect on their EPS was observed on each of the disclosure indicators, namely economic, environmental, and social, using the multiple linear regressions. In short, the research model is as figure 1.

**Figure 1. Research Model**
5. Results and Discussion
The hypotheses were examined using a multivariate regression analysis in SPSS. Of 30 sample companies processed, four (4) data were outliers, resulting in 26 data to be processed with the following findings: Our statistical model is $\text{EPS} = -263133.603 + 20597.297 \text{ Economic} -105889.992 \text{ Environmental} + 174047.592 \text{ Social}$. The results of hypothesis test indicate $H_1$, disclosure of economic indicators does not affect EPS, $H_2$, disclosure of environmental indicators does not affect EPS, and $H_3$, disclosure of social indicators influences EPS (table 2).

| Model            | Unstandardized Coefficients | Standardized Coefficients | t     | Sig  |
|------------------|-----------------------------|---------------------------|-------|------|
| (Constant)       | -263133.603                 | 160234.619                | -1.642| 0.115|
| Economic         | 20597.297                   | 44954.909                 | 0.108 | 0.458|
| Environmental    | -105889.992                 | 57928.392                 | -0.521| 0.182|
| Social           | 174047.592                  | 74865.14                  | 0.671 | 0.03 |

*Dependent Variable: EPS

From the three results of hypothesis testing, it appears that only the disclosure of social indicators affects EPS. This finding raises the suspicion that social disclosure is a concern of investors compared to the other two disclosures. In general, the response to growing public awareness of the importance of sustainable development may become the reason for this phenomenon [20]. However, this social disclosure is essential for investors to ensure that the company is free from potential disputes that arise due to social problems that may not be appropriately handled by the company.

Meanwhile, the findings on the disclosure of economic and environmental indicators in the sustainability report, which do not support the hypothesis, are thought to be due to the many factors that cause the opportunity for profit in the form of earnings per share / EPS to be unlikely seen from the disclosure in the sustainability report; instead, it can be obtained directly in the financial statements or annual reports. In this case, the quality of disclosure of economic and environmental indicators in the sustainability report is the least noticed information to determine the opportunities for the profitability of the company.

In addition, the results of simultaneous regression data indicate that the Sig value is at 0.107, which means that, simultaneously, the disclosure of the three indicators, economic, environmental, and social, does not affect EPS. This is also reinforced by the findings from the processed data that the Adjusted R Square value on the model is only at 0.134, indicating that the three disclosure elements only contribute 13.4% to the EPS variable whilst other factors outside the model have 86.6% influence. One of the possible allegations arising from this finding is that sustainability reports remain a complementary source of information because there is a tendency that an increase in reporting does not mean increasing transparency but merely releasing the company from its accountability obligations, instead; consequently, investors do not pay much attention to the quality of disclosure sustainability report [21].

These findings are in line with the previous research, in which sustainability reports are positioned as a tool to drive change and improve competitive advantage even though it remains in the conceptual stage. Specifically in the construction sector, the existence of sustainability reports still leaves challenges around data quality, stakeholder engagement, management reputation, and climate in the construction sector [14].

6. Conclusion and Limitation
Based on the data and hypothesis testing, the quality of disclosure of sustainability reports on sub-economic indicators does not support the proposed hypothesis. This finding is related to the fact that information about the potential amount of earnings per share / EPS cannot merely be accessed through
sustainability reports, but instead, it can be seen in financial statements accessed through financial reports, prospectuses, and other information media. The same findings also exist in the environmental sub-indicators, which do not further support the research hypothesis. This is reasonably possible in many companies that still apply the command control approach that is as long as the company complies with the rules, this will not affect its potential profitability. However, on social sub-indicators, the results of this study indicate that the hypothesis is supported. In other words, the quality of social indicators in sustainability reports is positioned as a vital source of information to communicate the company's operational performance and can be a predictor of corporate profit opportunities. This research has specific practical implications for companies related to the need to increase stakeholders' involvement regarding improvements as valuable information for them. The limitation of this study is the non-robustness of the model, which restrains it from being generalized into a broader context.

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