

The Effect of Green Accounting and Material Flow Cost Accounting on Corporate Sustainability in Islamic Economic Perspective: Study on Manufacturing Companies Listed on the Sri-Kehati Index 2016-2020

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Abstract: This study aims to analyze the effect of green accounting and material flow cost accounting on corporate sustainability (Studies on manufacturing companies listed on the Sri-Kehati Index 2016-2020). The object of this research is corporate sustainability as the dependent variable, and two independent variables, namely green accounting and material flow [secondary data obtained from the company's official website, the Indonesia Stock Exchange, and the Sri-Kehati Index. The data used in this study is secondary data with documentation collection techniques and literature study as well as the data analysis used is panel data regression analysis using the computer program E-views 10. The population in this study are manufacturing companies listed on the Sri-kehati Index 2016-2020. The sample in this study consisted of 6 companies in the 2016-2020 period, so there were 30 samples. The sampling technique in this study used purposive sampling. The results show that partially green accounting has no effect on corporate sustainability, material flow cost accounting has a positive and significant effect on corporate sustainability.

Keywords: Green Accounting, Material Flow Cost, Accounting Corporate Sustainability

1 Introduction

The development of environmental issues has become a public concern in encouraging company awareness to carry out environmental management in its business activities. However, an industrial activity that is growing rapidly at this time is one of the causes of environmental damage there are still many companies that focus on achieving profits without considering the negative impact of their production activities on the environment and the community around the company. Increased human awareness of the impact of environmental damage that will affect future survival has an impact on companies with greater demands that

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not only generate maximum profit but also pay attention to waste management so that environmental sustainability is maintained. The environmental sustainability that is achieved will be very beneficial for the community and the company in the long term. If viewed from the positive side, industrial activity has helped the country's economy a lot and absorbed a lot of workers. In addition, the industrial sector which acts as a sector leader can spur development in other sectors (Ridwan, 2016). Thus, corporate awareness is needed in managing the environment and social life in addition to the company's activities to achieve its goals. (Anatan, 2009, p. 6)

Companies are not only required to prioritize owners and management, but also all related parties, such as employees, consumers, as well as the community, and the environment. This is because the existence of the company cannot be separated from the interests of various parties. Manufacturing is an industry that has a very close relationship with the environment. This is because the sounds produced by production machines can potentially produce noise pollution, the means of transportation used can potentially produce vibration and dust pollution, excessive use of groundwater, wastewater that does not meet quality standards, oil seepage or oil, fuel leaks have the potential to produce water pollution and the gases produced can result in air pollution if not considered. (Utami, 2020) Therefore, this research was conducted in a manufacturing company.

In the era of the company's movement towards a green company, the industry is not only required to be limited to waste management but also demands from the community-consumer further, namely that the production process of an item from taking raw materials to the disposal of a product after being consumed (used) does not damage the environment. . (Kusumaningias, 2013, p. 137)

The government and society are increasingly aware of the importance of the environment. This can be seen from the formation of environmental care institutions and movements, as well as the enactment of various laws and government regulations related to environmental protection. (Witjaksono & Djaddang, 2018, pp. 97–114) One of them is the Law of the Republic of Indonesia Number 40 of 2007 concerning Limited Liability Companies Article 74 Paragraph (1) contains the following:

"Companies that carry out their business activities in the field and/or related to natural resources are obliged to carry out Social and Environmental Responsibility".

Green accounting is an effort to link the company's economic interests and environmental conservation (Kusumaningias, 2013, p. 137). Green accounting is considered an important tool to understand the influential aspects of the natural environment related to the economy (Farouk et al., 2012, pp. 36–43) . Green accounting is part of environmental accounting that combines environmental benefits and costs into decision-making. Green accounting is influenced and affects those around the company that stand.

Material flow cost accounting is one of the methods of environmental management accounting that aims to reduce both environmental impacts and costs at the same time. However, the basis of material flow cost accounting is to find ways to reduce costs by reducing waste, which in turn will lead to the development of business productivity. The main purpose of material flow cost accounting is so that the costs of losses resulting from the production of materials can be evaluated which then makes a decision that helps companies to treat their waste. "The Influence of Green Accounting Implementation and Material Flow Cost Accounting on Sustainable Development," 113. The waste management approach is carried out by applying material flow cost accounting, namely the process improvement strategy, in which companies modify products and production processes to produce little or no pollutants. also find ways to recycle their waste.

In general, the greater the profits obtained by a company, the more guaranteed the survival of the company. Therefore, if a company makes various efforts to increase its profits, for example by increasing productivity and cost-efficiency. Increased productivity can be obtained by improving work management through simplifying processes, reducing inefficient activities, saving process and service time, as well as using the most efficient materials, and cutting costs as low as possible. (Laub, 1999) However, at this time there has been a shift in the goals of a company, from profit-oriented to stakeholder-oriented. Companies realize that they should not only pursue profits but also serve the wishes of stakeholders. The company also realizes that the abandonment of the company by consumers and stakeholders means that their source of profit will also be lost. Therefore, the survival of a company cannot be separated from its external environment, both natural and social. Companies must pay attention to environmental issues so that stakeholders believe in the company, spending costs for the environment is an investment for the company in the future. (Loen, 2018, p. 8) .

Research on the effect of *green accounting* and *material flow cost accounting* on *corporate sustainability* has been carried out by several researchers, but still has different results, including the results of research by M. Wahyudi Abdullah , Mishelei Loen, Selpiyanti and Zaki Fakhroni *green accounting* has a significant positive effect on *corporate governance. sustainability*, while the research of Windasari Rahmawati and Abdul Karim, Verlita Dewi Roslaine, and Eni Wuryani obtained the results of research that *green accounting* hurts *corporate sustainability*. Based on the research that has been done previously, many research studies have been carried out in companies *listed* on the Indonesia Stock Exchange, the research time is less than 5 years and the mining sector.

2 Literature Review

2.1 Stakeholder Theory

Stakeholder theory is the basic theory to understand the importance of environmental responsibility for companies. In stakeholder theory, companies must pay attention to the interests of stakeholders, so companies will get support from stakeholders to achieve their goals in obtaining sustainable financial and non-financial performance(Sisdianto & Fitri, 2020, pp. 9–24).

Stakeholders are attachments based on certain interests. Thus, talking about stakeholder theory means discussing matters relating to the interests of various parties(Ghozali & Chariri, 2007, p. 17). Stakeholder theory is that stakeholder is a system that is explicitly based on views about an organization and its environment, regarding the nature of the interplay between the two which is complex and dynamic. Stakeholders and organizations influence each other, this can be seen from their social relations in the form of responsibility and accountability. Therefore the organization have accountability to their stakeholders (Freeman et al., 2021, p. 1762).

2.2 Legitimacy Theory

Legitimacy theory is a theory that is in the framework of political economy theory that influences society in order to determine the allocation of financial resources and other economic resources, companies tend to use legitimacy-based performance because it is important in the company's future development. The rationale for legitimacy theory is that organizations will continue to exist if society realizes that organizations operate for a value system that is in line with society's value system (Mousa, et. al., 2015).

2.3 Green Accounting

Green Accounting is accounting that identifies, measures assesses and discloses costs related to the company's activities related to the environment. (Cohen & Robbins, 2012, p. 190) Environmental accounting is a science that is influenced and affects the environment. Its existence is not value-free concerning the development of the times. Bookkeeping methods also continue to evolve following the increasing complexity of the business. When concern for the environment begins to get public attention, accounting is improving itself so that it is ready to internalize various externalities. (Ghozali & Chariri, 2007, p. 29)

The importance of using environmental accounting (*green accounting*) for companies or other organizations is explained in the function and role of environmental accounting (*green accounting*). These functions and roles are divided into two forms. The first function is called an internal function and the second function is called an external function. The *green accounting functions* are as follows:

1. Internal functions are functions related to the company's internal parties. Internal parties are parties that carry out business, such as consumer households and production households, and other services. The dominant actor and factor in this internal function is the company's leadership. Because the leadership of the company is the person who is responsible for every decision making and determining every company's internal policies. As with other corporate environmental information systems, internal functions make it possible to manage environmental conservation costs and analyze costs of environmental conservation activities effectively and efficiently and according to decision making. In this internal function, environmental accounting is expected to function as a business management tool that can be used by managers when dealing with business units.
2. External functions are functions related to aspects of financial reporting. In this function, an important factor that needs to be considered by the company is the disclosure of the results of environmental conservation activities in the form of accounting data. The information disclosed is a quantitatively measured result of environmental conservation activities. This includes information about the economic resources of a company.

According to Ikhsan, the purpose and intent of developing environmental accounting are as an environmental management tool used to assess the effectiveness of environmental conservation activities and as a communication tool with the public that is used to convey negative environmental impacts, and environmental conservation activities and their results to the public (Ikhsan, 2008).

2.4 Material Flow Cost Accounting

Material flow cost accounting is a management instrument that can increase the use of materials effectively and efficiently to reduce production waste. *Material flow cost accounting* is a tool to reduce costs by reducing waste which can ultimately lead to increased business productivity (Ulupui et al., 2020, p. 745). Material flow cost accounting is an effective tool that serves to help organizations better understand the potential environmental and economic impacts used on materials and labor. The concept of factory process improvement usually focuses on reducing *lead time*, waste or useless materials, etc. which spurs increased productivity of the production line (Loen, 2019, p. 15) The advantage of using the *material flow cost accounting model* is that it can increase profits and productivity (internally) and reduce negative impacts on the environment (externally) which in turn contribute to the development of the company's sustainability (*corporate sustainable development*).

Material flow cost accounting can be used as a tool to increase the transparency of *material flow* in energy use, and costs related to environmental impacts, and to support company decisions through information obtained through *material flow cost accounting*. Applying *material flow cost accounting* into production can provide a clear picture of the problems faced by the company. There are four principles of *material flow cost accounting*, which are as follows:

- 1) Understanding of material flow and energy use.
- 2) As a liaison for physical and monetary information data
- 3) Ensure accuracy, completeness, and comparability of physical data
- 4) As a tool for determining and estimating the cost of material losses.

By applying the principles of *material flow cost accounting*, the company will benefit. One of the advantages that can be obtained by using *material flow cost accounting* is that it can reduce the impact of environmental damage (external) so that it can increase company profits and productivity (internal). So that it can contribute to the sustainability of a company.

2.5 Corporate Sustainability

According to the US EPA, *sustainability* is based on a simple principle that can be interpreted as everything we need for survival and the well-being of life that directly or indirectly affects the natural environment. Sustainability creates and maintains a condition in which humans and nature can live in harmony, which allows for meeting the social, economic, and other needs of current and future generations. The concept of sustainability was introduced globally by an entity called the *Brundtland Commission in the Our Common Future* reporting activity organized by the *World Commission on Environment and Development*.

There are five elements for corporate organizations in developing a sustainable environment, namely economic sustainability, social indicators, environmental analysis, independently selected sustainability indicators, and the materials and resources used. (Company, 2018) The sustainability of a company is a development factor to meet current needs without compromising its future ability to meet its own needs. The survival of a company depends on the profits it earns. This profit then becomes the main goal of establishing a company.

3. Research Method

This research uses quantitative research with a descriptive approach. This study uses a causal associative approach, the causal associative approach is research that has the aim of knowing the relationship or influence between one variable and another (Sugiyono, 2017, p. 37) The population in this study, namely companies listed on the Sri-Kehati index during 2016-2020 period. The sample of this study amounted to 30 samples and sampling using purposive sampling. The criteria for sampling, namely:

1. Manufacturing companies listed in the Sri-Kehati index during the 2016-2020 period.
2. Manufacturing companies in the sri-kehati index that publish their financial reports continuously during the 2016-2020 period.
3. Not delisted in the Sri-Kehati index during the study period.

The analysis technique that will be used in this research is using the panel data regression analysis technique with the help of the *E-views 10 program* to obtain a comprehensive picture of the influence of the independent variable on the dependent variable. The regression equation is as follows:

$$CS = \alpha + \beta_1 GA + \beta_2 MFCA + \varepsilon$$

$$= 4.64E+13 - 4.58E+11 GA + 0.418672 MFCA + \varepsilon$$

Note :

- CS = corporate sustainability
- GA = Green Accounting
- MFCA = Material Flow Cost Accounting
- α = Konstanta
- β_1, β_2 = Parameter
- ε = error

4 Results and Discussion

4.1 Results

Classic assumption test

The results of the normality test in this study can be seen in Figure 4.1 below:

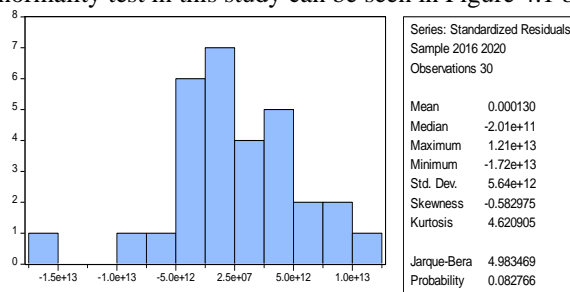


Figure 1. Normality Test Results

Source: *E-Views 10* processed in 2022

By the results of the normality test that has been carried out using *E-views 10* above, it can be seen that the value of *Jarque Bera* is 4.983469, with a *probability* of 0.082766. By the JB statistical assessment criteria, with a probability value of 0.082766 > 0.05, it means that it passes the normality test.

Multicollinearity test

The data is said to be free from multicollinearity problems if the correlation value between the independent variables is less than 0.80 (80%).

Table 1. Multicollinearity Test Results

	GA	MFCA
GA	1.0000000	-0.407572
MFCA	-0.407572	1.0000000

Source: *E-Views 10* processed in 2022

Based on the results of the multicollinearity test in Table 1., it can be seen that the correlation value between the independent variables is less than 0.80, namely -0.407572, it can be concluded that the data is free from multicollinearity problems.

Heteroscedasticity Test

The following are the results of the heteroscedasticity test:

Table 2. Heteroscedasticity Test Results

Variable	Coefficient	Std. Error	t-Statistics	Prob.
C	2.98E+12	8.23E+12	0.361625	0.7211
GA	2.72E+11	2.39E+12	0.113579	0.9106
MFCA	0.004698	0.042210	0.111292	0.9124

Source: *E-views* processed in 2022

Based on the results of the heteroscedasticity test in Table 2, it can be seen that the probability value of the independent variable is greater than the alpha value (α) 0.05, namely *green accounting* 0.9106 and *material flow cost accounting* 0.9124. it can be concluded that the data is free from heteroscedasticity symptoms.

Panel Data Regression Analysis

Table 3. *Fixed Effect Model* Panel Data Regression Analysis

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.64E+13	1.58E+13	2.944092	0.0075
GA	-4.58E+11	4.58E+12	-0.100140	0.9211
MFCA	0.418672	0.080807	5.181124	0.0000
R-squared	0.989703	Mean dependent var		6.78E+13
Adjusted R-squared	0.986427	S.D. dependent var		5.56E+13
S.E. of regression	6.47E+12	Akaike info criterion		62.05837
Sum squared resid	9.22E+26	Schwarz criterion		62.43202
Log likelihood	-922.8756	Hannan-Quinn criter.		62.17790
F-statistic	302.0910	Durbin-Watson stat		2.201794
Prob(F-statistic)	0.000000			

Source: *E-views 10* processed in 2022

The explanation of the linear regression equation for the panel data above is as follows:

- A constant with a value of 4.64E+13 indicates that if all independent variables are equal to zero (0) then *corporate sustainability* is 4.64E+13.
- The regression coefficient value of *green accounting* is negative at -4.58E+11, meaning that if *green accounting* increases by 1%, then *corporate sustainability* decreases by -4.58E+11 assuming other variables remain.
- The coefficient value of *material flow cost accounting* is positive at 0.418672, meaning that if *material flow cost accounting* increases by 1%, then *corporate sustainability* will increase by 0.418672 assuming other variables remain.

Partial Test (t)

By the results of the t-test, it can be discussed the results of the t-test as follows:

- Testing the *green accounting variable* on *corporate sustainability*
According to the results of the t-test, the t-count value is -0.100140 and the t-table is 1.70329 with a probability of 0.9211. Because the t-count < t-table (-0.100140 < 1.70329) and because the probability is > 0.05, partially the *green accounting independent variable* does not affect the *corporate sustainability variable*. Thus H0 is accepted or Ha is rejected.
- Testing the *material flow cost accounting variable* on *corporate sustainability*
The results of the t-test, the results show that the t-count value is 5.181124 and the t-table is 1.70329 with a probability of 0.0000. Because t-count > t-table (5.181124 > 1.70329) and because probability < 0.05, partially independent *material flow cost accounting*

variable has a positive and significant effect on Indonesia's foreign debt variable. Thus H_0 is rejected or H_a is accepted.

Coefficient of Determination

The value of the *Adjusted R-squared* is 0.986427, this means that the variance of *green accounting and material flow cost accounting* can explain the variance of *corporate sustainability* of 98.46%, while the remaining 1.36% is explained by other variables outside the model.

4.2 Discussion

The effect of green accounting on corporate sustainability

By the results of the t test, it is found that partially *green accounting* has no effect on *corporate sustainability*. This is because the *green accounting regression coefficient* is negative at -4.58E+11. In addition, because the value of t-count < t-table (-0.100140 < 1.70329) and probability 0.9211 > 0.05. Thus h_0 is accepted or rejected h_a .

The results of this study are supported by research conducted by Windasari and Abdul Karim in 2021, the results This study shows that *green accounting* does not affect the sustainability of the company. This is indicated because the disclosure of green accounting in companies that are members of the *Jakarta Islamic Index* that won the green industry award is only voluntary.

The environmental damage that occurs is the responsibility of humans to further repair. As mentioned in QS Al-Baqarah (2): 30

وَأِذْ قَالَ رَبُّكَ لِلْمَلٰئِكَةِ إِنِّي جَاعِلٌ فِي الْأَرْضِ خَلِيفَةً قَالُوا أَتَجْعَلُ فِيهَا مَنْ يُفْسِدُ فِيهَا وَيَسْفِكُ الدِّمَآءَ
وَنَحْنُ نُسَبِّحُ بِحَمْدِكَ وَنُقَدِّسُ لَكَ قَالَتْ إِنِّي أَعْلَمُ مَا لَا تَعْلَمُونَ ٣٠

"(Remember) when your Lord said to the angels, "I want to make a caliph on earth." They said, "Are you going to make people who destroy and shed blood there, while we exalt Your praise and sanctify Your name?" He said, "Verily I know what you do not know."

The verse above explains that humans are caliphs who are obliged to regulate, maintain, prosper and explore this nature with full wisdom. Achieving corporate sustainability or in Islam, it is called welfare (Fallah), do not let it have a bad impact on the environment around the company.

The effect of material flow cost accounting on corporate sustainability

By the results of the t-test, it is found that partially *material flow cost accounting* has a positive and significant effect on *corporate sustainability* . This is because the *material flow cost accounting regression coefficient* is positive at 0.418672. In addition, because the t-count > t-table (5.181124 > 1.70329) and the probability is 0.0000 < 0.05. Thus, h_0 is rejected or h_a is accepted.

This research is supported by previous research, namely Mishelei Loen's research. The results in this study indicate that there is a positive effect of *Material Flow Cost Accounting* on *Sustainable development*. In another study conducted by Rochman Marota, Marimin, and Hendro Sasongko, the results of this study indicate that *Material Flow Cost Accounting* has a positive and significant influence on the sustainability of the company.

This research is also in line with research conducted by Vina Karmia entitled "The Influence of Green Accounting and Material Flow Cost Accounting on Company Sustainability (Empirical Study on Mining Companies Listed on the Indonesia Stock Exchange 2015-2019) ", showing the results that *material flow costs accounting* has a significant effect on the sustainability of the company. (Princess, 2020)

Legitimacy theory and *stakeholder theory* are theories that explain the motivation of managers or organizations to disclose sustainability reports. If *stakeholder theory* is motivated by accountability to stakeholders, then *legitimacy theory* uses motivation to get approval or acceptance from the community. *Legitimacy from stakeholders* is very important for the company because the existence of a *legitimacy gap* has a great potential for protests from *stakeholders* against the company which has an impact on the company's existence and disrupts operational stability and ends up in profitability. Legitimacy from the community is the most important operational resource for the company because it is related to *corporate sustainability*. (Tarigan & Samuel, 2015, p. 70) Where with the implementation of *material flow cost accounting* the production activities carried out by the company are more effective and efficient so that the results of the waste that are felt by the community will be reduced and the natural resources that exist are not explored excessively. This is very beneficial for the company by minimizing materials and waste that have a good impact on finances and the public's view of the company itself.

In general, the greater the profits obtained by a company, the more guaranteed the survival of the company. Therefore, if a company makes various efforts to increase its profits, for example by increasing productivity and cost-efficiency. Increased productivity can be obtained by improving work management through simplifying processes, reducing inefficient activities, saving process and service time, as well as using the most efficient materials, and cutting costs as low as possible (Laub, 1999).

With a focus on high efficiency and low costs, it is hoped that the company will be able to compete with other competitors and meet product standard requirements and maintain an increase in the company's sustainability value, so as to maximize profit achievement and provide safe investment for shareholders. Marota, Marimin, and Sasongko, "Design and Implementation of Material Flow Cost Accounting for PT XYZ Company Sustainability Improvement," 103.

With a focus on high efficiency and low costs, the company is expected to be able to compete with other competitors and meet product standard requirements and maintain an increase in the company's sustainability value, to maximize profit achievement and provide safe investment for shareholders. Marota, Marimin, and Sasongko, "Design and Application of Material Flow Cost Accounting to Improve the Sustainability of PT XYZ Company," 103.

Applying *material flow cost accounting* in the production process provides an overview of the problems that occur in the company. Companies can increase material productivity by using *material flow cost accounting*. it can be concluded that *material flow cost accounting* is a management tool used to support the relationship between the environment and the economy.

Material flow cost accounting is a management instrument that can increase the use of materials effectively and efficiently to reduce production waste. In Islamic literature, efficiency is an understanding to try to achieve the best results. Efficient in Arabic is called *iqthisad* from the root *qasdu*. The word *qasdu* itself according to Ibn Mandzur has five equivalent words, including *istiqomah* (*istiqamah*), fair (*al-adl*), balanced (*alwast*), purpose (*tijah*), and not too wasteful and not too economical (*ma baina al-israf wa at-taqir*). *Iqtisad* in the view of Islam both economic development, as well as the provision and improvement of abundant welfare, are tools to meet human needs and as the foundation of society, especially the relationship between the world and the afterlife, in other words for the benefit of the hereafter also. (Job, 2012, p. 40). In several verses of the Qur'an, Allah commands people to do justice. Fair is defined as not oppressing and not being oppressed. Therefore, in achieving the company's welfare (*falah*), do not oppress other creatures, both nature, and humans.

5 Conclusion

Based on the results of tests and analyzes that have been carried out regarding the effect of *green accounting* and *material flow cost accounting* on *corporate sustainability*, it can be concluded that *green accounting* has no effect on *corporate sustainability*, and *material flow cost accounting* has a positive and significant effect on *corporate sustainability* and according to an Islamic economic perspective. that humans as caliphs are given the mandate to preserve and protect the environment. Therefore, humans should use everything that God has entrusted to them properly without bringing bad impacts and damage to the environment. In the economic management system, it must be based on justice and stay away from ways that endanger the community based on consensual consent (*between din minkum*) and one party does not oppress the other party (*latazlimuna wa la tuzlamuna*) so that it reaches the level of *fallah* .

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