

Influence of Carbon Management Accounting on Firm Value

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Abstract—The main objective of this research was to investigate the influence of carbon management accounting on firm value between companies in Indonesia listed on the Indonesia Stock Exchange (BEI) and Thai companies listed on the Stock Exchange of Thailand (SET) in 2012-2016. This study used verification and descriptive methods to see the influence of relationship between variables. The independent variable was carbon management accounting and the dependent variable was firm value with Tobin's Q as proxy. The samples were determined using saturated sampling technique to Indonesian companies which implement the clean development mechanism and are listed on the Indonesia Stock Exchange and Thai companies that implement the clean development mechanism and are registered in Stock Exchange of Thailand throughout 2012-2016. Result of the research indicated that the carbon management accounting does not have influence on the firm value of Indonesian companies, but does have positive influence on firm value of Thai companies.

Keywords—carbon management accounting; clean development mechanism; firm value; Tobin's Q

I. INTRODUCTION

Issues on environmental damage recently become topic of discussion in many countries. One of the hot issues discussed is related with global warming. Global warming is phenomena of rise in average temperature globally due to greenhouse effect resulted from the increased emission of gases such as carbon dioxide (CO₂), methane, nitrous oxide (N₂O) and chlorofluorocarbons (CFCs) thus trapping sun's energy in the earth's atmosphere.

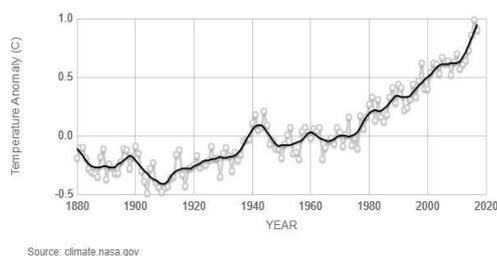


Fig. 1. Change of Global Temperature. Source: NASA 2017 [1].

In figure 1, it can be explained that there is rise in average temperature in the world every year. Rise in temperature is

caused by human and industrial activities emitting carbon thus causing excessive amount of the emission in atmosphere. In data issued by NASA [1], the rise in average global temperature in 2017 is 0.9°C, the highest recorded since 2001. The growth of industrial sector in economic development has impact on the increasing carbon emission resulted from operational activities of companies [2].

Several cases that have happened in Indonesia and Thailand with bad effect on environment and society include: the growth of industrial sector in Cilegon with effect of worsening air quality in the city [3]; Thailand Pollution Control Department has reported that Thailand's air quality has hit dangerous levels [4].

These environmental issues that are continuously discussed in the whole world has become United Nations' (UN) attention, leading to the signing of Kyoto Protocol in 2005, an international treaty related with UN Framework Convention on Climate Change (UNFCCC), which set legally binding target for reducing international emissions.

Based on data from World Resources Institute (WRI) in 2017, Indonesia ranks 8th of the top ten contributors to carbon emissions in the world, with China being in the first place with emissions of 11795 Mt CO₂e. Among ASEAN members, Indonesia is the first rank of largest carbon emitter, with Thailand on the second place followed by Malaysia, Vietnam, Philippines, and the Myanmar on the last place.

Indonesia first time ratified the Kyoto Protocol on June 28, 2004, with the issuance of Law No. 17 of 2004 [5]. However, before that, Indonesia has also issued regulation on environmental management through Law No. 27 of 1997. Specifically, through Limited Liability Companies Law No. 40 of 2007, Article 74, Government has regulated the company activities. In Article 1 of the Law, it is explained that Limited Liability Company which operates in the sector of and/or related with natural resources is obliged to undertake social and environmental responsibility (*tanggung jawab sosial dan lingkungan*, or abbreviated as TJSL).

Besides Indonesia, Thailand was even earlier in ratifying Kyoto Protocol, in August 28, 2002. Efforts to reducing carbon emission took effect in 2008-2012. Specifically, in 2007, under the Ministry of Natural Resources and Environment, Thailand Government has established a special organization, Thailand

Greenhouse Gas Management Organization (TGO). The organization is public organization with objectives to analyze, scrutinize and to enhance private bodies' ability and competitiveness in conducting mitigation projects on conservation of natural resources, environmental quality for national sustainable development. In Indonesia, the Government has also made a program, Program for Pollution Control, Evaluation and Rating (PROPER), implemented by Indonesian Government since 2002 under Ministry of Environment.

In each activity, company generally aims to gain maximum profit to maintain sustainability (sustainability report). Company's sustainability, besides considering economic growth, should also consider environmental aspect related with the company [6]. Companies are now demanded to make strategy in every activity while continuing to consider environmental aspect.

Reported from market.bisnis.com on January 20, 2018 that emission of global green bond will again set a record. Quite high demand from investor's supports the growth of green bond market, that now investors tend to maintain the sustainability and practice of risk management. This shows that investors are care for issues related with environment.

Companies in the world are now attempting to reduce emissions resulted from their activities in order to implement the requirement of Kyoto Protocol, and one of the ways they take is through implementation of carbon management accounting [2]. Carbon management accounting is implication of Kyoto Protocol, where companies are now required to make recognition, assessment, recording, presentation and disclosure of carbon emissions. Carbon management accounting system can be used to design sustainable report in accordance with Global Reporting Initiative (GRI) that can add value to the company to be used in investment analysis [2]. Carbon management accounting can also be used for company's strategic interests in global competitive activities which begin to lead to the green or environmentally friendly concept and sustainability.

Accountant has important role to play in environment based accounting management. Accounting profession is facing the challenge to ensure interdisciplinary collaboration, development of a framework to include the environment and development of valuation for sustainable growth [6]. With carbon management accounting, companies begin to implement clean development mechanism (CDM) in accordance with Kyoto Protocol mechanism as their operational standard. Implementation of clean development mechanism is expected to reduce carbon emission resulted from company activities. According to Burrit, carbon management accounting can be used by company in carbon cost management, long term investment related to carbon reduction project, and valuation of expected profit from investment in clean development mechanism project for reducing carbon emissions [7].

Clean Development Mechanism (CDM) is a framework of regulations on business practices and procedures that include the aspect of environment. Companies which are implementing clean development mechanism will received Certified

Emission Reduction (CER) as recognition that they are involved in carbon emission reduction efforts. The certificate can be sold in accordance with Kyoto Protocol regulation on Carbon Trade, which information can be found in official site www.unfccc.int. CDM is the biggest source in providing carbon data for investors and for public, and CDM project is company's activity in carbon management as part of emission reduction effort in accordance with the result of Kyoto Protocol.

Implementation of carbon management accounting is expected to improve company's environmental performance. Environmental performance is company's performance in creating good (green) environment. Disclosure of carbon emissions can be used as a consideration by investors in measuring the sustainability of a company, the higher the environmental performance of a company means the higher the firm value to increase [8]. Company's environmental performance is not only the form of company's social responsibility but also to show to potential investors its commitment in realizing the company's sustainability.

Previous research by Saka regarding disclosure of carbon emission on firm value has indicated that there is positive influence of the disclosure of carbon emission on firm value, and that company which implement carbon management accounting tend to have higher value for investors [9]. Another research by Anggraeni has also concluded that disclosure of carbon emission has positive influence on firm value [8]. However, Matsumura [10] and Griffin [11] conclude that disclosure of carbon emission has negative influence on firm value. While research by Amran titled Business Strategy for Climate Change: An ASEAN Perspective suggests that ASEAN are aware of climate change, and focus on strategies of fuel efficiency and carbon emissions reduction which are expected to increase trust and firm value [12].

Based on background explained above, statement of problem in this research is how is the influence of carbon management accounting on firm value in Indonesia and Thailand. In this research, the test was conducted for each country.

II. LITERATURE REVIEW

A. Carbon Management Accounting

Carbon management accounting system was introduced to gather information in response to regulatory, market and informational requirements as steps are taken to regulate the growing carbon emissions in countries signing Kyoto Protocol, to design sustainability reports in accordance with the Global Reporting Initiative (GRI) and to support the purposes of financial investment analysis [13,14].

Carbon management accounting is one part of accounting designed to provide managers with information that will assist companies facing short and long term decisions about carbon emission issues in a world where company activities are strongly implicated in the related ecological crisis [7]. Dwijayanti in simple manner suggests that carbon management accounting is process to measure, record and report carbon

emissions of the company with main objective to reduce the carbon emissions as part of agreement in Kyoto Protocol [15].

B. Clean Development Mechanism

Clean Development Mechanism is an implementation of Kyoto Protocol. In Kyoto Protocol, there are three categories in flexible mechanisms, i.e. joint implementation, emissions trading and clean development mechanism.

Clean Development Mechanism (CDM), set under Kyoto Protocol, is the international offset program. CDM emphasizes on reduction of CO₂ gas emissions in every industrial process and deliver the achievement of emission reduction to related institutions to obtain incentive from the result of emission reduction.

C. Firm Value

Firm value is perception of investors towards the company, which is usually linked to the share price. Firm value established by the indicator of stock market is heavily influenced by investment opportunities [16]. Firm value is very important because high firm value will be followed by high prosperity of the shareholders [17].

D. Theoretical Framework

Based on the literature review outlined above, theoretical framework for this research can be presented as follows:

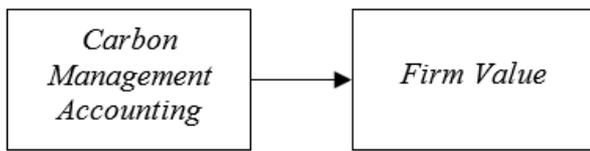


Fig. 2. Theoretical framework.

E. Hypothesis

Based on theoretical framework above, then hypotheses for this research are: (1) Carbon Management Accounting has influence on firm value of Indonesian companies listed on BEI; (2) Carbon Management Accounting has influence on firm value of Thailand companies listed on SET.

III. METHODS

This research used verification and descriptive design with quantitative approach. Descriptive research is research aimed at describing facts and characteristics of certain population in systematic, factual and accurate manner, or effort to describe a phenomena in detail [18]. And verification research is research method aimed at determining relationship between variables through test with statistic calculation to determine whether a hypothesis is rejected or accepted [19]. Then, Sugiyono suggests that quantitative research method is a research based on positivism, used to study certain population or sample by collecting quantitative/statistical data using research instruments to test the determined hypotheses [19]. Based on saturated sampling technique which all members of populations are used as sample, 7 Indonesian companies listed

on BEI and 7 Thailand companies listed on SET were taken as the sample for this research. Hypothetical test used was panel data regression analysis.

IV. RESULTS

A. Influence of Carbon Management Accounting on Firm Value in Indonesia

Result of hypothetical testing using panel data regression on Indonesian companies indicated that variable carbon management accounting has significance level greater than 0.05, i.e. 0.1314 with coefficient value of -2.750159, meaning that hypothesis is rejected and, therefore, it can be said that carbon management accounting does not have influence on firm value in Indonesia.

This indicates that disclosure of company's carbon related information through carbon management accounting does not get response from equity market.

This is in line with result of Sudibyo's research [20] where carbon management accounting has no influence on firm value. Meanwhile, this is not in line with researches by Nurdiansyah [2] and Anggraeni [8] in which information on carbon management accounting has influence on firm value.

Lack of resources can inhibit company's carbon management thus it has no influence on firm value [20]. Not all companies have sufficient financial resources to carry out disclosure of information related to carbon management thus the it has no influence on firm value. In addition, the success in increasing firm value needs to be supported by good operational performance in management of carbon emissions [21]. Investors tend to see what has been conducted through the performance instead of who conducts it, thus the value will be created from the process conducted by the management. Result of this research also indicated that average value of carbon management accounting in Indonesian companies throughout 2012-2016 is still at around 0.50 or 50% of total indicators to be met. This means that Indonesian companies have not been optimum in implementation of carbon management accounting.

Data of investment in Indonesia related to carbon management and climate also shows that transparency level of investment attractiveness in Indonesia related to carbon management and climate is relatively low due to weak implementation of green policies and regulatory inhibition that limits the capacity building. Indonesia has national climate target and renewable energy target of relative low ambition. Poor governance in Indonesia limits the predictability policy thus investment rank in Indonesia tends to be low.

B. Influence of Carbon Management Accounting on Firm Value in Thailand

Result of hypothetical test using panel data regression indicated that variable carbon management accounting has significance level less than 0.05, i.e. 0.0000 with coefficient value of 4.902866, meaning that hypothesis is accepted and, therefore, it can be said that carbon management accounting has influence on firm value in positive way. This indicates that disclosure of company's carbon related information through

carbon management accounting gets response from equity market. This supports the result of Saka's research where information on carbon management accounting has positive influence on firm value [9]. This is also in line with result of Nurdiansyah's research suggesting that carbon management accounting has influence on firm value projected in share price index [2].

V. CONCLUSION

Based on theory and result of research titled Influence of Carbon Management Accounting on Firm Value, then conclusions that can draw from this research are as follows:

- Based on result of panel data regression analysis on 7 Indonesian companies listed on BEI and implementing clean development mechanism from UNFCCC in 2012-2016, it can be concluded that carbon management accounting does not have influence on firm value in Indonesia. This indicates that information on carbon management accounting gets no response from equity market, meaning that increase in value carbon management accounting is not followed by increase in firm value.
- Based on result of panel data regression analysis on 7 Thailand companies listed on SET and implementing clean development mechanism from UNFCCC in 2012-2016, it can be concluded that carbon management accounting has influence on firm value in Thailand in positive way. This indicates that information on carbon management accounting gets response from equity market, meaning that increase in value carbon management accounting is also followed by increase in firm value.

Several recommendations for future research are:

A. For Company

In company's carbon management and participation related with global warming issue, companies that has not yet implement carbon management accounting can consider to begin its implementation as form of company's responsibility to environment due to its activities and to meet requirements of regulation made by government, of both Indonesian and Thailand, as well as international regulations related to environmental management on the risks of global warming.

B. For Future Researcher

- This research used only one independent variable, i.e. carbon management accounting, thus future research should consider to add more independent variable, i.e. carbon trading, to support the relationship between variables.
- In this research, the samples were only Thailand and Indonesian companies listed on respective stock exchange, i.e. SET and BEI, that implement clean development mechanism in 2012-2016, thus future research should consider to add more samples such as

companies in ASEAN region and study a longer period to get more comprehensive information.

- In this research, the samples were companies that implement clean development mechanism from UNFCCC, thus future research should consider to add comparison between companies implementing clean development mechanism and companies not implementing clean development mechanism.

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