

Carbon emission disclosure: does it matter

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Abstract. The purpose of this research were to test empirically the relationship of Volume of Carbon emission, Carbon Management Practice disclosure and Carbon disclosure emission with firm value, especially in Indonesia as developing Country. This research using data from Indonesian sustainability Award in 2013-2015. The instrument of this research was adapted from CDP Questionnaires to score the disclosure of Carbon Management Practice. While the carbon emission disclosure instrument was dummy variable. For volume of carbon emission, this research used the quantity or volume of carbon reported in sustainability reporting. We find that Volume of carbon emission was not related to Firm value. Also Carbon disclosure Emission does not have relationship with Firm value. Both hypotheses were not consistent with [8] which was doing their research in Developed Country. While Carbon Management Practice Disclosure, using CDP Questionnaires, has positive relationship with Firm value. The conclusion is developing country as resource constraint need to be motivated to report and disclose carbon emission from voluntary reporting to mandatory by regulation from government, not just only for high sensitive industry but also low sensitive industry. Then developing country which has resource constraint need to have more proactive strategy to prevent carbon emission instead of reducing carbon emission.

Keywords: carbon management practice, CDP questionnaires, developing country, volume of carbon emissions

1. Introduction

The issues of Climate change has been growing for a decades in developed country, but only few about Climate change in Developing countries. We need to encourage and bring private and public sectors to move immediately and put into action on both mitigation and adaptation. This action will get impact and stimulate the market for generating more investment to achieve sustainable energy in the future. According to [1] the effective tool for combating the climate change is carbon pricing, which translates carbon pollution into a price that governments, business or company and customers can factor into their reinvestment decisions. This is also considered in Sustainable finance.

Researcher [2] said that there is a need of strong public pressure globally to mitigate GHG emission even though regulatory requirements for GHG mitigation are vary greatly among countries. It means that there might be differences in regulation and policy between developed and developing countries.

This is also discussed in [3], that sustainability reporting becomes an integral to global action which need to considers environmental and social problems. As a result , there is a need also to consider the policies, regulations, standards and other instruments and should have encourage organizations to report it.



The consumption of household in Indonesia is much increasing in accordance with the increasing of the income. There is also shift the consumer social life percentage in a decade from 2005 until 2015. The number of households with high annual disposable income of over IDR 120 million (on average of US\$ 10,000) or IDR 10,000,0000 per month. The estimation of Indonesia's middle class which was consisting of income between IDR 36-120 millions, will also expand to achieve 32 million households by 2020. This means represent a growth in consumption. As a result, the energy consumption for household product will also be increasing and also the carbon emission. This will be a big problem for carbon emission reporting and disclosure. At the end will influence the cost of using energy. Will it be reduced? Or we need to have strategy for carbon emission. That is a matter of fact we need to solve.

While the regulation for motivate and drive to make the environment activities or carbon emission is not set properly and procedure or guidance for Indonesia especially in those activities only did by some few of company. Almost company with enough funding will make the sustainability report. From 525 company only 100 more make and produce the report. So it means that is such voluntary reporting. If there is mandatory and there is penalty and forced by government, there will be most company prefer to report and disclose it. This is the second matter we need to consider, funding constraint. After we explain about the problem of disclosing and reporting. We discuss why to report.

What is the contain or the company need to disclose and reporting? It is also a matter. GRI 4, extended to GRI standard is just talking how to report environmentally, but not especially carbon emission. In addition, there is no information about Indonesia's company included in CDP. It means there is no official staff concerning Indonesia carbon emission.

Researchers [4] doing research on Determinants of Environmental Disclosure which considers industry type, size of the firm and profitability. The samples are Dutch listed company as developed country. They find out that industry type and firm size have significant influenced on Environmental disclosure, but profitability does not have relationship to environmental disclosure. Their argument is the research using data in financial crisis condition, which is some company have debt and financial distress.

Researchers [5] discussed about mix reporting using mandatory and voluntary for carbon emissions. Some of the literature notes the significance and the important of reporting instead of detailed investigation or reporting assessment of different type of carbon emissions, carbon intensity, volume of carbon and carbon reporting.

Why carbon emission disclosure and reporting is very important? The reasons are there is a need from investor to take a look at the environmental risk of the company. It means that investor needs information to assess the sustainable development and how the environmental protection and activities being done by the company. So that the investor will make more better in decision making for their portfolio.

Since research topics about CSR and sustainability has spread and done by some researchers in Indonesia, but only little concern in doing research on especially in Environmental activities and also in Carbon emission. That is motivation of doing research in topic of carbon. They did their research with the sample of Australia, Dutch company as developed country, so in this research using Indonesia as developing country.

Researchers [6] discuss the carbon emission by comparing the developed and developing country. From their findings, developing country as resource scarcity or shortage will have little commitment to carbon mitigation and disclosure. Their samples of developing country were China, India and Russia at CDP global Report.

They find out that carbon disclosure has direct and strong relationship with the resource availability, especially in developing country. It means that shortage of financial resources will be the important reason for the lack of commitment to carbon mitigation and disclosure in developing country. This is related to resource constraint theory. Their results also indicated that company tend to disclose carbon information if their shares are owned by CDP signatories. This is because their company will be viewed as more powerful stakeholders.

The other findings was the environmental reporting which was detailed in content in developed country (Deegan, 2002), but developing country only stated in sentences, not detailed, few supported with data in physically and or monetary

Reserachers [7] doing research with title of carbon emission and financial Performance with the mediation of carbon disclosure in the UK. They extended the instrument used as CDP Questionnaires for 18 items into 42 items. Their Findings were volume of carbon emission has negative relationship with financial performance, but carbon emission disclosures have positive and significant relationship with financial performance. Also, the level of implementation of carbon emissions reduction strategies within the UK industrial sectors is fairly “low” and varies significantly across the four sectors; with relatively high uptake in the energy and utilities sector, and low uptake in the construction sector. The level of implementation of change management initiatives to deal with carbon emissions reduction initiatives is also relatively “low”.

The significance of doing this research is first, there is increasing awareness regarding environmental issues, so that company have the consideration for disclosing carbon emission. This increasing awareness disclosure of carbon emission is happened in developed country such America, Europe and other Asian developed Country such as Japan and Singapore. Indonesia is included as developing country which is disclosing carbon is still new and hot issue and only few companies reported and disclose the carbon emission. Developing country have less funding to disclose compare to developed country [6]. The empirical evidence and research findings also supported that developing countries are falling behind in carbon disclosure compare to developed country. Second, for carbon disclosures and reporting the company need funding for that activities. In general, developing countries has less funding compare to developed country. The question is that even though reporting and disclose carbon emission is important, if the company does not have enough funding, how can they disclose? So this need to be checked or researched. Third, [6] argued that carbon disclosure in developing countries was optional or voluntary and not as mandatory. Because of those reasons, this research will be conducted in Indonesia as developing country.

The result of this research will be important as information for suggesting OJK to consider about investment opportunity related to Carbon disclosure emission. Also OJK as Government need to consider for drive the mandatory reporting of carbon emission disclosure, so that it will support transparency or governance, not just only as positive information that will increase reputation, but also if there is negative information which might be signaling of company image and reputation. Then, as CEO of the company, this negative information will give faster information for decision making for reducing risk in the future.

2. Research Method

2.1. Data Collection Procedure

The population of this research was all company participating in the ISRA (Indonesian Sustainability Reporting Award) for the year of 2013-2015. The criteria for the sample that will be used are: companies participating in the ISRA, publish the annual report and sustainability report in 2013-2015, and as well as companies that implicitly or explicitly disclose carbon emissions.

2.2. Research Variables

Volume of Carbon Emission is measured by content analysis to find the amount of volume of carbon emission which was disclosed in Sustainability Reports. This is adapted from [8].

This research was adapted the CDP Questionnaires which has 18 items. Disclosure of Carbon Management Practice is measured by scoring, by giving maximum score is 18 and the minimum score is 0. Each item is worth 1 if the company discloses all of the information in the report so that mean company score is 18. Score on each company then totaled and divided by 18. The Carbon Emission Disclosure checklist, adapted from [9] can be seen in Table 1.

Tabel 1. Carbon emission disclosure checklist.

Climate Change: risks and opportunities	CC1- Assessment/description of the risks (regulatory, physical or general) relating to climate change and actions taken or to be taken to manage the risks
	CC2- Assessment/description of current (and future) financial implications, business implications and opportunities of climate change
GHG Emission	GHG1- Description of the methodology used to calculate GHG emissions (e.g. GHG protocol or ISO)
	GHG2- Existence external verification of quantity of GHG emission- if so by whom and on what basis
	GHG3- Total GHG Emissions – metric tons CO ₂ -e emitted
	GHG4- Disclosure of scopes 1 and 2, or scope direct GHG emissions
	GHG5- Disclosure of GHG emissions by sources (e.g. coal, electricity, etc.)
	GHG6- Disclosure of GHG emissions by facility or segment level
	GHG7- Comparison of GHG emissions with previous years
Energy Consumption	EC1- Total energy consumed (e.g. tera-joules or peta-joules)
	EC2- Quantification of energy used from renewable sources
	EC3- Disclosure by type, facility or segment
GHG Reduction and Cost	RC1- Detail of plans or strategies to reduce GHG emissions
	RC2- Specification of GHG emissions reduction target level and target year
	RC3- Emissions reductions and associated costs or savings
	RC4- Cost of future emissions factored into capital expenditure planning
Carbon Emission Accountability	AEC1- Indication of which board committee (or other executive body) has overall responsibility for actions related to climate change
	AEC2- Description of the mechanism by which the board (or other executive body) reviews the company's progress regarding climate change

Carbon emission disclosure was measured using a dummy variable, where the value of 1 to companies that disclose Carbon Management in the annual report and sustainability report, while a value of 0 is the opposite where the company does not disclose Carbon Management in the annual report and sustainability report [8].

3. Results and Discussion

3.1. Overall Significance of Regression Test Samples (*F* Statistic Test)

For testing the research framework goodness of fit, we used *F* test and find out that all the hypotheses are accepted, because the significance result is 0.016 which is lower than 0.05. It means that Volume of Carbon Emission, Disclosure of Carbon Management Practice and Carbon Emission disclosure will influence and have relationship with Firm value.

According to the research [8], the estimated coefficient on Carbon Emission per unit is given by the negative net assets, profit before extraordinary things and profit forecasts. The greater the volume of Carbon Emission, means that the cost of the company is increasing. Also, it will increase the risk of the company. As a result the profit of the company will decreasing and it will influence the price of stock. Instead, the company expect more greater market value of the firm's. It means that the company need to reduce the carbon emission. While [10]. supported that the volume of carbon emission have a negative association with firm value. It means that every additional thousand metric tons of carbon emissions will decrease the Firm value.

Table 2. Simultaneous test results in regression analysis (*F* Test).

The Regression Model	F	Sig.	Conclusion
Multiple Regression Model	3.575	.016	Ha accepted

From the Table 2, the F test supported the hypotheses that Volume of carbon, Carbon Management Practice and Carbon disclosure Emission have relationship to Firm Value. This finding is supported the research of [8].

3.2. Significant Individual Test Parameters (T Statistic Test)

Table 3. Individual parameter test results (T Test).

Variable	Regression Coefficient (β)	T-Stat	Sig.	Conclusion
Firm Value	11.468	1.564	0.127	-
Volume of Carbon Emission	-1.383	-0.688	0.496	H ₁ rejected
Disclosure of Carbon Management Practice	33.836	3.084	0.004	H ₂ accepted
Carbon Management Disclosure	-15.009	-1.486	0.147	H ₃ rejected

3.3. Findings and Discussion

Hypotheses testing h1 was rejected because of the significance value, but the coefficient regression was negative which was supported the hypothesis area. It means that if volume of carbon emission was increasing, it will reduce the firm value. The reason was this research used only 14 companies, while the population of ISRA was 168. Data was reduced due to incomplete or not reporting the volume of carbon. In general Indonesian Company only explain there is carbon emission, but not recording the volume. This is also consider as lack of management practice and knowledge of reporting [8].

Hypothesis 2 is supported and consistent with [8], even though we used different way of calculation. It means that Carbon Management Practice Disclosure have positive relationship to firm value. The higher score of carbon Management Practice disclosure it will increase the Firm Value.

Hypotheses 3 is rejected, means that Carbon disclosure emissions has not relationship to Firm Value. The reason was the used of dummy variable which not really explained the motives of disclosure. Only 3 companies doesn't disclose the carbon emission. The logical thinking that it should have relationship, but the statistical result is not supported.

While Firm Value was measured using Tobin's Q which included short term and long term debt of company, the company still have burden to pay financially in the future. That is the reason hypotheses 1 and 3 were not supported. If the company just only using Market Value of Equity, it will be better findings. So future research we need to use Market Value of Equity for measuring Firm Value.

4. Conclusion

The research model was accepted, means there were relationship of volume of carbon emission, carbon management practice disclosure and carbon emission disclosure with firm value. While t test for individual hypotheses only carbon management practice disclosure have relationship with firm performance. The hypotheses which were not accepted or rejected were the volume of carbon emission has not relationship with firm value and carbon emission disclosure has not relationship with firm value. The evidence suggests that resource shortages may constrain a firm management's carbon decisions. As the regulatory environment becomes more stringent, firms, particularly those in developing countries need to take a more proactive strategy to tackle global warming challenges and balance the need to achieve financial goals and prevent carbon pollution with their limited resources. The use of Tobins Q as measurement of Firm Value is not a proper or match instrument. In Tobins Q contains of short term and Long term Debt which company need to pay in the future. Therefore there is burden to pay and contain also with risk. So how come with the company to legitimate with disclosing Carbon emission while there is still burden financially First, there is possibility to use Market value of Equity instead of Tobins Q for better instrument of Firm Value. Second, the carbon disclosure score is

measured directly from individual companies' annual reports and sustainability reports. A checklist is established to determine the breadth and depth of the information on related to climate change and carbon emissions incorporated in these publicly available reports [2].

References

- [1] Kim, Yong Jim, Carbon Pricing Leadership Report, 2016-2017
- [2] Aggarwal R, & Dow S. 2011. Greenhouse Gas Emissions Mitigation and Firm Value : A Study of Large North-American and European Firms.
- [3] King, Fogelberg, Hoballah, Malan, 2016, Carrot and Sticks Report: Global trends in sustainability reporting regulation and policy
- [4] Burgwal and Vieira, 2014, Environmental Disclosure Determinants in Dutch Listed Companies, R. Cont. Fin. – USP, São Paulo, v. 25, n. 64, p. 60-78, jan./fev./mar./abr.
- [5] Haigh M, & Shapiro M A. 2012. *Auditing & Accountability Journal*. 25(1):105-125.
- [6] Luo L, Tang Q, & Lan Y C. 2013. Comparison of propensity for carbon disclosure between developing and developed countries : A resource constraint perspective. *Accounting Research Journal*. 26(1):6-34
- [7] Liu S, Zhou X, Yang J, & Hoepner A. Corporate carbon emission and financial performance: does carbon disclosure mediate the relationship in the UK? *In: European Accounting Association Annual Congress 2017*, 10-12, May, 2017, Valencia, Spain.
- [8] Saka C, & Oshika T. 2014. Disclosure Effects, Carbon Emission and Coporate Value. Sustainability Accounting. *Management and Policy Journal*. 5(1).
- [9] Choi B B, Lee D, & Psaros J. 2013. An analysis of Australian company carbon emission disclosure. *Pacif Accounting Review*. 25(1):58-79.
- [10] Prakash MatsumuraR, & Vera-Muñoz S. Carbon Emissions and Firm Value. 2010
- [11] Fani E, Pengaruh Pengungkapan Emisi Karbon dan Corporate Social Responsibility Terhadap Nilai Perusahaan (Studi Empiris Pada Perusahaan Manufaktur yang terdaftar di BEI Periode (2010-2013), 2015.