A Review of Economic Factors Influencing Voluntary Carbon Disclosure in the Property Sector of Developing Economies

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Abstract: Global warming has consequences on the environment and economy; this led to the establishment of United Nation Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol. These two agreements were to reduce greenhouse gases (GHG) emissions which are responsible for climate change and global warming. Developing countries under the protocol are not obligated to reduce or disclosure GHG emission, so their participation in the protocol is on voluntary mitigation bases. This study intends to examine economic factors that influence voluntary carbon disclosure in the property sub-sector of developing countries based on annual report of listed property companies in Malaysia. Signaling theory addresses the problem of information asymmetry in the society. Disclosure is an effective tool to overcome information imbalance among different market participants. The study hypothesizes that the economic factors that influence voluntary carbon information disclosure in developing countries are: (1) the company’s size; this is because a large-sized company have more resources to cover the cost of reducing pollution. (2) The company’s gearing status; where there is no sufficient information disclosure in a highly geared company will result to an increased agency cost. (3) Profitability; profits grants companies a pool of resources for mitigation activities and environmental reporting. Also, carbon disclosure acts as a means for achieving public confidence and legitimacy. (4) Liquidity: Companies that are highly liquid will disclosure more information to distinguish themselves from other companies that are less liquidity. This is correlated to environmental disclosure. (5) Financial slack affects companies’ ability to participate in green technology projects that enable a reduction in emission.

Keywords: Carbon emission, greenhouse gases, Property sector.

1.0 INTRODUCTION

Changing landscapes, sea level rise, severe storms and increased risk of flooding and drought - these are some the examples of the effects of climate change [1]. Climate change has serious consequences on all levels of life on earth; especially in the environment and society [2-5]. However, there is also the impact on the national and global economy, with the negative consequences, ranging from loss of earnings [6, 7], to climate change-related disasters [8]; with a subsequent increase in cost of emission reduction. The result of climate change led to the establishment of two agreements to address the pressing issue of reducing anthropogenic greenhouse gases (GHG) emissions in the atmosphere: the United Nation Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol. The UNFCCC is a joint treaty designed at alleviating GHG concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. The Kyoto Protocol came into being on 11 December 1997 at the third Conference of the Parties (COP) of the UNFCCC, and entered into force on 16 February 2005. The purpose of the Protocol is to encourage countries to reduce the emissions of carbon dioxide and other gases which cause greenhouse effect. The Kyoto protocol requires developed countries to reduce their emissions of GHG by a collective average of 5% below their 1990 levels [9]. These regulations became necessary due to the activities of companies that are main sources of emissions responsible for the greenhouse effect. This is because industries all over the world depend heavily on the burning of fossil fuel for manufacturing activities and power generation, hence the main contributors to global warming and climate change. While in the past companies, despite their contribution to greenhouse gas emissions have been largely excluded in the search for solutions, now carbon disclosure is a mechanism for market stakeholders to make an informed decision on the state of a company’s emissions performance, and exert pressure on
companies to reduce their emissions. Developed countries that ratified the Kyoto protocol are obligated to enact regulation incorporating the protocol’s provision on disclosures while developing countries are not statutorily required to reduce their emissions under the protocol. Therefore mitigation and disclosure in developing economies are voluntary. So firms in developing economies are not bound to mandatory carbon disclosure, like firms in developed countries that have ratified the protocol. While industrialized counties set targets for significant reduction in CO₂ equivalent emissions by 2010, it was discovered that the cheapest source of CO₂ emission reduction is not with the industrialized nations but in developing countries. So it is accepted that for Kyoto protocol to achieve its objective of slowing global warming it will need the participation of developing countries in accepting an emission reduction commitment. This study tends to examine the economic factors that influence voluntary carbon disclosure in the property sub-sector of developing economies. The study is focusing on annual reports of listed property companies in Malaysia.

2.0 CARBON DISCLOSURE FOR CLIMATE CHANGE MITIGATION

The overall, the average temperature has increased by about 85°C since 1880 [10]. This has led to the experience of an upsurge in the surface temperature and the concentration of CO₂ in the atmosphere and the sea level is expected to increase from 26 to 81 centimeters by the year 2100 [10]. It is most likely that humans are the dominant cause of global warming, and without emissions reduction, the world is on track to a more than 2°C or 4°C possible warming by the end of this century [10]. Thus, there is a growing demand for the disclosure of information related to carbon [11];[12] especially within companies in the developing countries.

The burning of non-renewable energy sources, deforestation, farming, and transport result in the discharge of greenhouse gases (GHG) into the atmosphere. Greenhouse gases such as carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O) and chlorofluorocarbons (CFCs) are considered to be the main constituents to the greenhouse gases, which is the main cause for global warming. Research has shown that in the past 150 years human commercial activities have brought up CO₂ levels from 280 ppm to 379 ppm. Although some dissenting observations exist, researchers has gradually arrived at an agreement that the accumulation of these gases can change the environment of the Earth, with serious effects on human health and the environment, as well as significant threats to businesses. Many developed and developing countries have identified the risks created by global warming and are taken steps to mitigate the greenhouse effect, as part of their reaction.

Global warming is an issue that impacts a variety of companies around the world. The effects go beyond the ecological scopes, being connected to energy security and performance. It has become a subject of social, regulating and economic attention recently, and has been brought to the front as an "inconvenient truth" that requires a serious policy strategy [13]. While an obligatory control is unavoidable, organizations have been willingly disclosing information about their emission [14]. Although industry-focused strategy to climate change has taken over the public conversation and significantly supports the development of sustainability report.

2.1 VOLUNTARY CARBON DISCLOSURE IN THE PROPERTY SECTOR

Given the complexity of climate science and the impact it has on the overall well-being. The task of the state policy on climate change is huge and policies around carbon minimization is emerging around the world [14]. In 2009, the Climate Change Conference of the United Nations in Copenhagen (COP15) discussed future commitments to minimize carbon and climate change mitigation.

Carbon Disclosure has become a significant establishment for governance, awareness on climate change, clean energy and energy efficiency, and legitimacy. Companies measure the carbon emissions at the request of interested parties. Carbon measurement is done to get ahead of competition and regulation; or simply to identify spending cuts, there are a number of reasons to report this information voluntarily. Emissions information disclosure and reduction targets help to build trust among stakeholders and investors, and can help businesses understand their performance in the industry.
Carbon Disclosure has grown exponentially in recent years. This may be connected with the awareness of climate change and its impact on business and society as a whole, in tandem with constant demands for accountability from the investment community. Countries around the world are developing policies, particularly for the protection of the environment.

Carbon Disclosure can be understood as developing institution which provides a level of management in the broadest sense, as a multi-level, multi-actor system in regulations and standards [15, 16]. The role of markets [17] are also emphasized and the operational solutions and strategies that are important aspects of the company's management. Carbon Disclosure plays a role in three control modes; compliance, carbon trading and management through standards and civil accountability and transparency. Disclosure of carbon is important for regulatory compliance. It is also part of the carbon markets and carbon Management. Carbon markets are a key form of government, by imposing restrictions on emissions and put a price on carbon. Indeed, carbon as a tradable commodity is irrelevant built only on specific information protocols that require the development of systems of accounting for carbon [18]. Companies can also participate in the voluntary carbon markets, by investing in clean development mechanism (CDM) in developing countries.

Many companies are implementing carbon management systems, sometimes in the form of modules related to their accounting systems and logistics control. A key factor is the prospect of increasing internal efficiency, to reduce energy costs and calculation of the carbon footprint at the product level. Increasingly, companies push their suppliers to participate in the carbon accounting for the purposes of labeling and controlling costs.

Disclosure of carbon information helps to put pressure on the organization for accountability and transparency, the pressure which is [19] termed "civil right" is enforced by non-government organizations. Most companies are beginning to provide a very informative analysis of the financial risks of climate change. The financial community is very focused on determining which companies are threatened by climate legislation, this type of exposure, and how it affects the potential investment.

2.2 Evolution of carbon disclosure

The evolution of carbon disclosure demonstrates the importance of creating a "business model" that is institutionally viable. As a result, business leaders have expressed doubts about the value of investments in external communications in the absence of the public [20]. The establishment of measurement and reporting of carbon are still growing. Businesses are becoming increasingly interested in the carbon information systems that are useful for measuring and monitoring greenhouse gas emissions at the facility, process or product level. Carbon Disclosure, therefore, has potential value to managers and companies. Over the years most firms and governments have created carbon and clean energy practices, for these companies, the carbon measurement, management and reporting, and analysis represent a vast new opportunity in the market.

Measurement for carbon is now considered an important stream of research that attracts a growing community of international researchers [9, 21]. Previous studies have generally focused on the economic impact of carbon emissions [22] or incentives for the management of voluntary disclosure of GHG [23, 24]. In particular, some studies have examined the influencing factors at the country level and found that ratification of the Kyoto Protocol [25], the severity of the regulatory environment, the environmental sensitivity of the private, market structure [26] and the resolutions of shareholders [27] are crucial in disclosing the company's GHG emissions. Most of these carbon studies have focused on developed countries; this study looks at the developing countries.

Declaration of carbon is part of global efforts to reduce carbon emissions, which include substantial investments and long-term commitment. Reporting often requires the creation of a carbon emissions inventory and implementation of carbon management. Also, once a company launches to the public disclosure of carbon, it is expected that the company will continue to do so, and termination of the disclosure can be considered by the market as a signal of lack of knowledge on climate change or the company's inability to manage the risk of carbon, which eventually may set a negative reputation with
stakeholders [28]. Thus, the lack of financial resources does not allow us to successfully adapt to internal and external pressure to change [29].

Companies that disclose their greenhouse gas emissions have a number of reasons, such as to maintain the legitimacy to defend its reputation to get the right picture and to participate in sustainable development programs voluntarily [12]. A couple of studies [23, 25] attempted to analyses the factors that affect voluntary disclosure of greenhouse gas. Because disclosure is not mandatory, it is likely that the limited resources outweigh the needs of the stakeholders. Thus, we expect that companies with higher leverage disclosure more. In companies with high growth potential, economic goals will be a high priority than environmental reasons [23, 30]. Thus, these companies will prioritize their actions to achieve financial goals, resulting in fewer resources for actions to reduce carbon emissions and disclosure. We expect that limited resources will be more pronounced for companies in developing countries.

2.3 THE EFFECTS OF CLIMATE CHANGE IN MALAYSIA

Malaysia is ranked 87th among 180 countries in terms of the degree of climate risk [31]. The real estate sector was hit particularly hard. Historical records show that Malaysia has experienced severe flooding in 1926, 1963, 1965, 1967, 1969, 1971, 1973, 1979, 1983, 1988, 1993, 1998, 2005, and December 2006 to January 2007 double floods (occurred in the state of Johor). It is estimated that the average annual flood damage in Malaysia to be about RM 3 billion (USD 0.79 billion) [32, 33]. The flooding of January 1971 had resulted in a loss of more than RM 200 million (USD 32.8 million) and the death of 61 people. In 2006-2007 the Johor state massive double flood had incurred a total cost of about RM 1.5 billion (US $ 0.41 billion) and the death of 18 people and about 110 000 people evacuated and sheltered in relief centers. Furthermore, Peninsular Malaysia has more than 29,000 km² of the total area that is prone to flooding [34, 35]. The trend of increased frequency and intensity of rainfall and rising sea level has the potential to expand flood zones and increase the problems of flood management, waves, and the erosion of shoreline.

It is anticipated that as 2020 approach, Malaysia should anticipate serious challenges in flood and drought management that will come with increased severity and frequency of flash floods, prolonged droughts, also with the threat of the corridor area’s exposure to 189 river basins [36]. As flooding results mainly from heavy rainfall during the monsoon seasons, the effect of climate change begins to manifest, as evidenced by the unprecedented flood of 2006-2007 state of Johor [37, 38]. This study looks at the participation of the property sub-sector in climate mitigation and environmental disclosure in general and carbon disclosure in particular in the annual reports of listed property companies in Malaysia.

3.0 THEORETICAL FRAMEWORK

3.1 Signaling Theory

Voluntary reports are efforts to eliminate the asymmetry of information between the company and external suppliers and investors in the investment community. "The concept of the voluntary disclosure provides that companies that have excellent environmental performance do not cover the environmental effects of their duties but voluntarily inform stakeholders about their actions in the field of sustainable development. The voluntary disclosure provides risk information to current and potential investors [39]. Voluntary disclosure can lead to a competitive advantage. When disclosure is absent or low stakeholders will assume the current environmental strategy adopted by the firm is inferior [40, 41]. Superior environmental performers truly disclose issues regarding environmental affairs, the quality of their disclosures are superior to the quality of the weak environmental performers. The superior firms believe that their strengths will outweigh the weaknesses and do not fear the reaction of any stakeholder [40].

Information signaling theory addresses the problem of information asymmetry in the society. In social research, the idea is based on the training work [42], which used the idea of the labor market, to show how candidates indicated potential to organizations. It was stated that a [42] high-quality job
Applicants signal through high education papers and resumes distinguishing themselves from low-quality applicants. Thus, the employers lack of information about the quality of the applicants as such the applicants acquire an education to signal their quality and reduce information asymmetry which often hampers the selection ability of the prospective employers. In this instance, education is used as a means of communicating the unobservable characteristic of the job applicant [43].

The designation will be an iterative process, which has also obtained most expensive cost of signaling [44]. There are different ways in which organizations can specify information about itself. Of this voluntary disclosure of useful information, reporting is regarded as one of the most profitable [45]. Signal theory can also be used to achieve the objectives of other concepts, [46] and it is recommended that, the theory can be widely used in the social sciences. It is also the opinion of a study [46] that the theory when focusing on desired signal indicate that the part of the signaling random negative information is neglected. It is [47] recommended that, in practice, parties should send various alerts, not knowing the report that could have a beneficial effect. In addition, the predictive capacity of the theory depends on the assumption that the recipient of the information, understands perfectly what is disclosed by the sender, yet the nature of the operating environment shows that evidence of a large company may affect the interpretation of the recipient [46].

Disclosure can be an effective way to overcome the asymmetry of information between the different market participants. In the context of climate change, many decisions must be made by consumers, investors, entrepreneurs and politicians, who will determine the success of the transition to a low carbon economy. Reports on energy and carbon information have increased over the past two decades, climate change and the role of business in their resolution became clearer. Measurement standards have emerged, but for most, it is voluntary for companies to disclose their carbon impacts and climate strategies.

4.0 Economic Factors Determinant for Voluntary Disclosure

Companies that systematically monitor their carbon emissions over the life cycle of a product, while keeping an eye on the bottom line, find ways to improve the allocation of resources, eliminate waste and reduce inefficiencies; it should not be surprising that investment in reducing carbon emissions gives higher yields. The study is bases on the theoretical framework as stated in figure 1 this showing the factors the influence voluntary carbon disclosure property companies in developing countries.

![Figure 1: The Theoretical framework of the study](image)

Company Size: The practice of social and environmental performance and the subsequent disclosure requires considerable resources in terms of funding and expertise. Large companies are considered to have more resources to cover the cost of reducing pollution and associated costs [25]. Therefore, the assumption that large companies will disclose more information than smaller firms holds. The availability of resources is of paramount importance to address the issues related to the mitigation of climate change, which often requires the company significantly operates. All studies on the disclosure
of greenhouse gas emissions found a significant positive correlation between the size of the company and the disclosure of information [12, 48].

Gearing: Based on the principles of agency theory [49], designed for management of the company that is strongly concerned with gearing may disclose more information to reduce agency costs. In fact, the risk is considered by shareholders and debt holders. A company that is highly leveraged; Lenders fear that if the company was not properly managed, it is possible that there is a transfer of wealth of shareholders. In this case, if sufficient information is not provided to lenders, they will find a means, and that results to increased costs for the institutions [50]. In a study [49], the increase in spending to reduce the level of disclosure of the company, is a way to minimize costs for the agency. Findings from literature on the effect of gearing on disclosure from empirical studies are mixed. It is concluded that they had no role, while another study [23] found a negative correlation. Another study [12] found no significant connection with greenhouse gas disclosure.

Profitability: [51] It is noted that profitability enables managers to a pool of resources that can be used to absorb the costs of environmental reporting. Studies argue that profitable companies are more susceptible to the public, so that interested parties may be interested in how the company makes its profit [48, 52]. Thus, profitable companies facing public pressure on how they made their profit can use information disclosure. Such disclosure of environment information justifies their profitability [53]. This disclosure may be a means of achieving public confidence and legitimacy in terms of how profits are made, not at the expenses of the environment. Empirical evidence on how greenhouse gases disclosure affects profitability is mixed. It was [23] found evidence of a significant negative correlation between profitability and disclosure with respect to GHG measure of profitability, but there is no significant relationship to the second indicator of profitability. A study [25] reported a non-significant relationship with profitability. However, other studies have found a significant positive correlation [48]. The idea seems to be consistent with the profitability of voluntary disclosure as a means of transmitting information to outside investors is seen as a tool to gain competitive advantage. The idea of this theory is that companies can use voluntary environmental disclosure to signal that their intangible assets will help to ensure future earnings. Rejection of this hypothesis would be to suggest that the financial performance or profitability due to the detection of an environmental signal connector will indicate whether it is positive or negative relationship [54].

Liquidity: Liquidity refers to the ability of the company to fulfill its short-term obligations. Based on the requirements of the theory of signals, a company with a high degree of liquidity would disclose more information in order to distinguish itself from other companies that are less liquid [55, 56]. Previous evidence has been mixed; it was [56] found that liquidity was the main factor determining a significant positive relationship between voluntary disclosures. Instead, it was [55] found that liquidity has no influence on the state.

Financial slack: The financial slack impact on the disclosure of GHG emissions, as companies allocate more financial resources to address climate change, including the disclosure of environmental information [57], financial slack has been found to enable companies to participate in new projects of which they could not participate if there were no surplus resources. It was [58] found that a company with more resources could explore new products. This affirms that more resources will influence activities such as emissions monitoring and reports and because significant investment in skills and human resources are required. It is [39] argued that the existence of unused resources allows the company to cover the costs associated with decisions on voluntary disclosure. Consequently capital expenditures in the assets and equipment may affect disclosure of greenhouse gas emissions, such as those with more advanced equipment are considered to be able to manage their emissions well compared to those with old equipment [59]. Thus, companies that make high level of capital expenditure are expected to have newer technique that will enable them to manage their emissions and, therefore, will be ready to make more disclosure. It was [60] found that companies with an aggressive environmental strategy, leading to the disclosure of relevant information on the environment often invest in new equipment and the more efficient operational environment. So invest in new, cleaner technologies and the management of being eco-friendly, management is committed to disclosing the information on this as a way to inform their stakeholders[61].
5.0 CONCLUSION

The economic factors that influence voluntary carbon disclosure in the property sector of developing countries by this review are the size of the company which determines the resource available to it. Then profitability and liquidity was determined the accessible funds of mitigation and disclosure activities. Finally financial slack influences the easy with which equipment and machinery are replaced to reduce greenhouse gas emissions.

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