CORPORATE GOVERNANCE, CLIMATE CHANGE REPORTING, FIRM PERFORMANCE AND MODERATING ROLES OF ABSORPTIVE CAPACITY: EVIDENCE FROM MALAYSIA

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ABSTRACT

Climate change is real, and Malaysia is not being spared from the adverse impact of climate change. This research examines the determinants of climate change reporting by looking into the relationships between corporate governance and climate change reporting on sample of 150 public listed companies which shares are traded in Main Board of Bursa Malaysia Berhad. In addition, this research also examines the moderating effect of firm's absorptive capacity on the relationships between the corporate governance mechanisms and climate change reporting. This research relies on three theories, namely Resource-Based View Theory, Knowledge Based Theory and Legitimacy Theory, as basis for firm-level explanation. Secondary data from annual and sustainability reports published by the sample companies are used for this empirical research. The results of Structural Equation Modelling – Partial Least Squared analysis suggest that there are positive significant relationships exist on four (4) corporate governance mechanisms or components, namely CEO's educational background, CEO's environmental experience, board gender diversity and ownership structure. It is also found that there is a positive significant relationship between firm's absorptive capacity and climate change reporting. In addition, research results indicate that the firm's absorptive capacity has moderating effect on the relationships between corporate governance and climate change reporting, specifically on board independence and CEO's environmental experience. Furthermore, the research also reveals that firm's climate change reporting leads to better firm performance.

Keywords: Corporate Governance, Climate Change Reporting and Absorptive Capacity

INTRODUCTION

Climate change is a real issue that the world is facing. In spite of the various scientific proofs, climate change can be seen through mere observations. The raising of sea level, melting of ice glaciers, extreme weather, air pollutions, are some of the phenomenal that threatens our world. Corporations with its business ambitions have been recognised as the malefactors (IPCC, 2007). Extensively rapid industrialisation, harmful deforestation, together with huge consumptions of fossil fuels are known to be the main causes. At the same time the phenomenal has place business at inevitable risk. Climate change depletes business profit and its values (Hague & Deegan, 2010). Due to this, it has attracted the interest of management researchers and business ethicists to study the organization factors that predict responds to climate change (Galbreath, Charles & Oczkowski, 2014).

In Malaysia, the recent disasters due to floods and landslides in Penang within the space of less than three months had demonstrated the might of climate change. The ill weather change struck the Government of Malaysia to face bills in a tune of millions of Ringgit as a result of

various deployment of emergency response team, evacuation of affected people, repairing the damage to infrastructure assets as well as spending on preventive measures. The damage had also affecting the business communities and ultimately the economic growth. In essence, akin to other developed and developing countries, the economic development in Malaysia is driven by its business communities. An economic development does come with a price. In parallel to the drive, there is a need for us to sacrifice our natural resources and environment in the name of development. However, in the wake of the clear and present threats pose by climate change, business communities, specifically firms, needs to be attentive and cautious in its approach when dealing with such resources and environment. One of the means used by firms in discharging their responsibility to communicate on issues concerning climate change to its shareholders, or stakeholders is through the climate change reporting. In Malaysia, reporting on climate change is not a mandatory requirement, and firms voluntarily disclose such information.

The discourse on the extent of corporate disclosures upholds a fine relationship to corporate governance practices. Thus, in this research, the impact of corporate governance mechanisms such as; board composition, board diversity and ownership structure towards the climate change reporting are examined through the lens of three theories. Namely, the Resource-Based View Theory, Knowledge Based Theory and Legitimacy Theory. This research employs a sample of 150 public listed companies which shares were traded in the Main Board of Bursa Malaysia as of 2019. The directors and key management team's utmost duty to their shareholders is to increase the firm's value, which ultimately increase the wealth of their shareholders. In so doing, they are also responsible to optimize and enhance the resources of the firms for future challenges, which thus include climate change response. Hence, as advocated by the Resource-Based View Theory and Knowledge Theory, it is imperatively vital for a firm to be able to exploit all of its resources. In particularly its knowledge, which are unique and not easily replicated, in order to create a competitive advantage situation (Barney, 1991). In essence, it is also crucial for a firm to be innovative in addressing issues concerning climate change. It requires a firm to be able to either adapt to a new condition, or finding ways to mitigate the risks of climate change that may affect its operations.

This research also examined another variable, known as absorptive capacity, in determining its impact towards the climate change reporting behaviour. This research also tested its moderating effect towards the relationship between corporate governance and climate change reporting. Absorptive capacity is condition where a firm is able to recognize the value of new, external information, and exploit it for its own commercial benefit (Cohen & Levinthal, 1990). In order to measure a firm's absorptive capacity, the amount of Research and Development ("R&D") spent by the firm against its sales figures is used as proxy. As mentioned earlier, one of the directors and key management team's utmost duties to their shareholders is to increase the firm's value. Therefore, in order to lead in competitive advantage, there is a possibility that they are motivated to embark into initiatives that are able to assist them in discharging their responsibility for the benefit of the shareholders. This may include any effort by the firm to address issues relating to climate change challenges. The effort may be either through adaptive innovations or mitigative innovations. According to a study by Galbreath, et al., (2014), firms that embarked into either climate change adaptive or mitigative innovations showed improvement in firm performance. Secondary data of the 150 samples are used as primary source for this research. The data are analysed using content analysis methodology. The Theoretical Framework developed in this research is tested using the Structural Equation Modelling ("SEM") approach with Partial Least Squares ("PLS") technique,

In a nutshell, this research examined the influence of corporate governance factors towards climate change reporting behaviour amongst Malaysian firms, as well as the relationship effect of absorptive capacity of the firm towards the climate change reporting. This research also attempts to examine the moderating effect of absorptive capacity on the relationship between the corporate governance and climate change reporting. In addition to the above, this research also investigates the association between climate change reporting and firm performance.

Malaysia is one of the signatories of Kyoto Protocol and Paris Agreement. During the 2009 Climate Change Summit in Copenhagen, the Government of Malaysia made a commitment to reduce its emissions intensity of Gross Domestic Product ("GDP") by up to 40% by 2020 based on 2005 levels (Ministry of Natural Resources & Environment ['MNRE'], 2011). In line with the commitment of the Government of Malaysia to preserve the environment, SC incorporated elements of environmental and social sustainability as part of good corporate governance which is to be adopted by Malaysian companies as underlined in the MCCG published in 2012, *i.e.,* known as MCCG2012. Recommendation 1.4 of MCCG 2012 recommends that the board of firms in Malaysia should ensure that the firm's strategies promote sustainability. In April 2017, SC issued MCCG2017, which superseded the earlier MCCG2012, in an effort to promote greater internalization of corporate governance culture amongst Malaysian firms. In simpler words, SC encourages the board of firms to integrate sustainability agenda in their firm strategies, with attention to be given on environmental, social and governance aspects of the firm's business which underpin sustainability.

SC's recommendation on such good governance practice on sustainability reporting may not only motivated purely by the fact that Government of Malaysia is one of the signatories to the Kyoto Protocol and Paris Agreement, but because such recommendation may also bring a positive effect to the economic growth of the nation in the long run. Boubakari & Jin (2010) found that there is a positive link between stock market and economic growth in economies where the stock markets are liquid and actively high. This fact may also be true in Malaysian context. According to Bursa Malaysia, as of 28 March 2017, the participation of institutional and foreign investors in Bursa Malaysia stood at 60.5% and 19.8% respectively (Kana, 2017). In Malaysia, most of those large institutional investors are controlled, either directly or indirectly, by the Government of Malaysia, for example, institutions like Khazanah Nasional Berhad ("Khazanah"), Permodalan Nasional Berhad ("PNB"), Kumpulan Wang Simpanan Pekerja ("KWSP") and Kumpulan Wang Amanah Pencen ("KWAP") to name a few. It is intrinsic for those government-controlled organisations to be amongst the first that support any new Government of Malaysia's initiative, which in this case, supporting the commitment made by the Government of Malaysia under the Kyoto Protocol and Paris Agreement. On top of that, as a developing economy, the Malaysia encourages the participation of foreign investors in the local market to stimulate the economic growth. This situation is rather common, particularly in the developing and less-developed economies, as Foreign Direct Investment ("FDI") has a positive effect on economic growth (Abdul Karim, Zaidi, Ismail & Abdul Karim, 2012; Ridzuan, Ismail & Che Hamat, 2017). It is also common that in those countries, the major source of FDI often comes from investment made by Multinational Corporations ("MNC") (Baharin & Sentosa, 2012). According to Baharin & Sentosa (2012), unlike the old days where MNC were seen as prioritising profitability without regards towards the effect to environment and society, they have now shifted their focus from solely looking at profitability to dealing with sustainability issues. As such it is not surprising that SC is very concern on issue relating to sustainability as more than 80% of the shares traded in stock market in Malaysia are owned by these two groups of investors. This is because there is a possibility that listed companies which are apathetic or indifferent on issues relating to environmental responsibilities may find that their share price to be negatively affected if such investors are rational in evaluating the future value of the company based on its present state of environmental responsibility (Ngwakwe, 2008), which repercussion can be devastating to the future economy growth of a nation.

Despite the efforts by SC to encourage Malaysian firms, especially the companies that are listed on Bursa Malaysia to disclose their strategies concerning environment preservation, the extent of environmental and climate change reporting in Malaysia is still noticeably low (Othman & Ameer, 2010; Amran, Ooi, Nejati, Zulkafli & Lim, 2012; Amran et al., 2014a; Amran et al., 2014b) and insufficient (Buniamin, 2012; Huui, et al., 2012). Studies conducted by Saleh, Zulkifli & Muhamad (2010) revealed that the number of listed companies in Malaysia disclosing environmental dimension in their CSR reporting was limited, and even if the

disclosure was made, it was limited to common statement related to environmental information or qualitative information. According to Barraclough & Morrow (2008), Malaysian firms are not ready for the implementation of climate change reporting (Barraclough & Morrow, 2008).

This situation is worrying as according to Burhan & Rahmanti (2012), firms which are not friendly to environment when undertaking their business activities may experience gradual depletion in earnings. Firms which ignore the impact of climate change may be exposed to various risks that can adversely affect their performance and firm's value, such as getting fines or penalty from relevant authorities as a result of polluting the environment, or may even be dragged to court which further exposed to incur unnecessary litigation costs or payment of compensations (Ngwakwe, 2008). On the contrary, firms which are concerned about sustainability may work towards developing new effective and efficient ways of doing business that has minimal impact to the environment, which may lead to better performance, be it financial or non-financial. This condition or ability where the firm is capable to recognize the value of new external information together with assimilating and applying it to commercial ends is known as absorptive capacity (Cohen & Levinthal, 1990). According to Aragon-Correa & Sharma (2003), a firm's absorptive capacity is the catalyst to implement voluntary or beyond-compliance proactive climate change reporting strategies, for example anticipating future regulations, social trends, and the designing or amendment of operations, processes, and products to prevent negative environmental impacts. However, information on organizational operating mechanisms that motivate the adoption of environmental management practices or strategies to enhance competitive advantage by firms is rather limited (Wagner, 2005).

Based on the above consideration, this research attempts to examine the factors that motivate Malaysian firms to embark into climate change adaptive or mitigative initiatives, as well as to investigate the moderating effect of absorptive capacity of the firm towards such climate change initiatives. Hence, this research proposes that the motivation for climate change reporting by listed companies in Malaysia is influenced by the level of their adherence to good corporate governance practices, as well as the absorptive capacity of the listed companies. In addition, this research also proposes that climate change reporting has a positive impact towards the listed company's performance. Therefore, the objectives of this research, are, to investigate the relationship between public listed companies' corporate governance practice and climate change reporting, to examine whether the absorptive capacity of public listed companies moderates the association between corporate governance practice and climate change reporting and to investigate the relationship between climate change reporting and performance of public listed companies.

LITRITURE REVIEW

Howard-Grenville, et al., (2014) labeled climate change as one of the "greatest challenges" faced by humanity in the 21st century. Climate change is actually a combination of package of challenges involving the "economic, environmental, social and moral issues" as described by Stern (2007). Wendel Trio (Director of CAN Europe) and Klaus Milke (Chairman of the Board, Germanwatch) stated that "*Our world is characterized by fast moving geopolitical and natural changes and the scenarios drawn by climate change specialists are alarming. If we want to avoid dangerous climate change and its ample consequences for creatures all over the world, it is necessary to take action right now"*. This statement affirms that the threats of climate change are real. To a certain extent, climate change can be devastating either to the environmental, or even social and economic development. This statement by Wendel Trio (Director of CAN Europe) and Klaus Milke (Chairman of the Board, Germanwatch) clearly indicates that there is an urgent need for actions to be taken to counter or minimize the potential adverse effects that climate change can bring to the environment.

Climate Change Reporting

In spite of its commitment in promoting corporate social and environmental reporting, the extent of such reporting in Malaysia is still in its infancy stage (Said, Hj Zainuddin & Haron, 2009; Othman & Ameer, 2010; Othman, Darus & Arshad, 2011; Amran et al., 2012; Ahmad & Mohamad, 2013). Therefore, it is not surprising that previous literatures on climate change reporting in Malaysian context normally emphasized or focused on the issues such as awareness on environmental issues, willingness to make disclosure, the extent of disclosure, and also factors or motivation that encourage Malaysian firms to embark into CSR reporting. In general, a lot of studies favoured to examine CSR reporting as a whole, while studies that focused on environmental reporting or climate change reporting amongst Malaysian firms are still lacking (Nazli & Sulaiman, 2004). In simple words, there is a short supply of climate change reporting studies done in Malaysia (Amran et al., 2012; Ahmad & Hossain, 2015). Amran & Haniffa (2011) found that Malaysian firms are becoming increasingly engaged in climate change issues and had started to adopt the practice of disclosing their environmental related activities in the annual report, or published such information in other form of communication media (Amran & Haniffa, 2011). Masud, Akhtar, Afroz, Al-Amin & Kari (2013) confirmed the assumption that awareness, knowledge and risks perceptions on climate change have positive influence on the firm's attitudes and actions toward climate change issues. In short, firms are more likely to accept pro-environmental behaviours only if they have sufficient understanding or information on the adverse impact of climate change issues (Masud et al., 2013).

In terms of Malaysian firms' willingness to make disclosure on environmental items, a study by Buniamin, Alrazi, Johari & Rahman (2011) proved that out of 243 companies listed in the Main Board of Bursa Malaysia, only 28% disclosed environmental information. However, a few literatures that conducted longitudinal studies on corporate environmental reporting in Malaysia revealed that corporate environmental reporting is positively increasing from the angel of the number of reporting organizations as well as in the extent of its reporting (Haslinda, Normahiran & Noraini, 2005; Alrazi et al., 2009; Saleh, Hisyam Selamat & Mohd Hanefah, 2009; Darus et al., 2014). Meanwhile, in terms of quality of the reporting, a study by Huui, Sing & Siddiq (2012) using companies listed on the Main Board of Bursa Malaysia as sample revealed that the extent of environmental reporting was low and insufficient. Amran & Haniffa (2011); Ahmad & Mohammad (2013) also found that environmental reporting in Malaysia was declarative, narrative and merely made reference to general commitment and charity undertakings. Findings by Ahmad & Hossain (2015) on discourse analysis conducted using the content of annual on corporates which reports prevailing issues of climate change and global warming reports revealed that the reporting are generally illustrative in nature.

Alrazi, et al., (2009); Ahmad & Mohamad (2013), Othman & Ameer (2010); Saleh, et al., (2010) also found in their studies that reported information was inadequate, incomplete and mostly confined to general and narrative assertions. It was also discovered that on average, a firm disclosed only 4.7 sentences in the environmental reporting, while in terms of quality of reporting (measured using reporting index), the average number of sentences in the reporting per firm was only 3.24 sentences (Buniamin, Alrazi, Johari & Rahman, 2011). Based on the findings of various studies concerning quality of reporting, it can be concluded that Malaysian firms merely reported environmental information for the sake of their image and reputation considerations, *i.e.,* to display themselves as environmentally responsible firms (Alrazi et al., 2009; Sulaiman et al., 2014; Ahmad & Hossain, 2015; Othman et al., 2011). Another conclusion which can be drawn from those studies is that CSR reporting by Malaysia corporates were more focus towards the notion of corporate philanthropy rather than disclosing matters concerning environmental issues (Mohd & Sayce, 2010). Zeghal & Ahmed (1990); Unerman (2000) pointed out that there is a need to examine a broad range of communication outputs in order to understand the full extent of firms' disclosure or reporting on CSR, environmental, sustainable and climate change, as only a small percentage of the disclosure provides meaningful

information that are beneficial to the stakeholders.

As climate change reporting disclosure is not made mandatory in many parts of the world except in few instances, Dragomir (2012) examined the content and items disclosed by top five European oil and gas companies in their sustainability reports. In the absence of any common standard or disclosure guideline, Dragomir (2012) found that there were inconsistencies in the corporate sustainability reports produced by the top five European oil and gas companies, particularly on the report of greenhouse gas emissions information. However, the study also observed an improved standardization in the reporting trend.

There are plenty of studies that attempted to understand the determinants of corporate social and environmental reporting. Hackston & Milne (1996) in their study tested on the relationship between size, profitability, industry membership, ownership structure and company's social responsibilities. Similar attempt was also conducted in Malaysia, for example, the study by Othman, Arshad & Darus (2009), to examine the determinants of CSR reporting by Malaysian public listed companies. Those studies found that firm size was amongst the prevailing determinant which has a positive relationship to disclosure of CSR reporting (Amran & Haniffa, 2011; Amran et al., 2012; Sulaiman et al., 2014). Another significant determinant is the Government of Malaysia's commitment in social and environmental reporting as firms with higher percentage of government ownership tends to be more willing to publish report on social and environmental related information (Said et al., 2009; Othman et al., 2011; Amran et al., 2012). Other prevailing determinants include of foreign ownership/investors (Haniffa & Cooke, 2002; 2005), industry membership (Haniffa & Cooke, 2005; Amran et al., 2012) and business networks (Amran et al., 2012), which were found to be factors that influence the voluntary reporting practices in Malaysia.

In the study by Amran, et al., (2012) which explored various factors that may influence climate change mitigation effort in term of in networking influence, it was concluded that climate change mitigation efforts are more successful if there were collaboration with members from the same business network. This finding implies that such networks can help promote better sustainability practices of climate change reporting disclosure amongst the firms.

A study on Greece 100 largest firms by Halkos & Skuloudis (2016) in which they used disclosure index to measure climate change corporate disclosures and the determinants which influenced Greek firms to disclose such information. This study revealed that only a small group of leading Greek companies appears to endorse a climate change discourse as an instrument of empowering stakeholders' decision-making. The subscription to externally-developed voluntary initiatives, international presence as well as operating in environmentally sensitive sectors, were the significant variables that positively affect climate change disclosure. The study also found that size of firm was one of the determinants that encourage disclosure but the effect was negligible. In contrast, determinants such as sector, profitability and type of ownership were insignificant factors that motivate Greek firms to make disclosure. The fact that the effect of size was negligible in Greece somehow contradicts the results of studies done in Malaysia, which size is found to be one of the prevailing determinants or motivation of disclosure.

In studies related to reporting on CSR, environmental, sustainability and climate change in Malaysia, the legitimacy and institutional theories are commonly employed to explain the results (Amran & Haniffa, 2011; Othman et al., 2011; Amran et al., 2012). Legitimacy Theory proposes that in order for a firm to appear less risky, it may publicly disclose more quality environmental information in order to legitimize its business activities. Findings on study that explore the links between corporate disclosure and the generation of legitimacy have practical significance as they are expected to have important policy consequences that determines the degree of disclosure by firms at the industry level (Pellegrino & Lodhia, 2012).

On the other hand, Institutional Theory proposes the firm responds to institutional pressure, and it emphasizes on the importance of regulatory, normative and cognitive pressure that influence a firm to adopt specific organization structure and practices (Scott, 2005). Study by Amran, et al., (2012) is one of the studies being conducted through the lens of Institutional

Theory, in which they investigated the existence relationships between organizational characters and climate change mitigation efforts. Based on the findings from the Malaysian studies mentioned earlier, particularly on the determinants that encourage behaviour of reporting on CSR, environmental, sustainability and climate change, there are more than enough evidences to suggest that climate change reporting in Malaysia is influenced by institutional pressures as proposed by the Institutional Theory. Recently, there is a trend in Malaysia to examine corporate social and environmental reporting through the perspective of Resource-Based View (Darus et al., 2014; Sulaiman et al., 2014; Amran et al., 2015). Resource-Based View emphasizes the importance of organizational resources in determining the motivations behind firms' decision to embark into climate change reporting. Taking cognizance on the previous study results, as well as the limitation on previous literatures which have been discussed earlier, this research intends to fill in the knowledge gap by examining the factors that influence the Malaysian firms to disclose climate change report based on an integrated framework, which take into consideration of the Resource-Based View perspective and the introduction of absorptive capacity factor that may moderate those relationships.

Related Theories on Climate Change Reporting

The development of a comprehensive theoretical framework which is able to explain the determinants and factors that are affecting the corporate reporting and disclosure of climate change information is still lacking (Hahn et al., 2015). At present, there are two dominant sets of theories that have been widely used in the corporate social and environmental reporting literatures. The two major classifications are, firstly the conventional economic theories, and secondly, the social and political theory. The conventional economic theories include the Agency Theory and Resource-Base View Theory, whilst the social and political theories refer to the Stakeholder Theory, the Legitimacy Theory, and the Institutional Theory (Gray et al., 1995a; Parker, 2005).

However, it is observed that many studies related to climate change innovation have acknowledged Resource-Based View Theory. Resource-Based View Theory is one of the theories that are best to be used in explaining the effect of firm's absorptive capacity as it examines on the issues relating to the utilization of internally available resources to create competitive advantage. The subsequent sub-sections shall discuss in details on various theories that can be applied in this research, specifically in regards to explaining the motivations, effects and causes of various variables to the extent of disclosure on climate change information by firms.

Corporate Governance

Many of literatures on corporate reporting and disclosure examine the association between corporate governance and its extent of disclosures. As climate change reporting is one form of corporate disclosure, many studies have examine the effect of corporate governance mechanisms such as board size, composition, independence and ownership structure toward the level or quality of climate change disclosures. This research examines a few mechanisms of corporate governance that may influence the firm to report on climate change issues. The Government of Malaysia has always been promoting Malaysia as a financial hub to be at par with other financial centers in Asia, such as Singapore, Hong Kong and Japan. In order to boost investors' confidence toward the local financial market, MCCG was introduced in 2000 by the SC. MCCG was revised twice since then, *i.e.,* 2007 and 2012, as exercises further reform and promote good corporate governance practices amongst firms in Malaysia. In April 2017, SC published a new MCCG which superseded the earlier edition in which it took a new approach to promote greater internalization of GC culture amongst the Malaysian corporates.

The main purpose of the introduction of MCCG is to strengthen board structure and

composition by recognizing the role of directors as active and responsible fiduciaries (MCCG, 2012). It acknowledges that board of directors has a duty to effective stewards and act as guardians to the firm. They are not only responsible for drawing strategic direction and overseeing the conduct of business, but they also must ensure that the firm conducts itself in compliance with laws and ethical values, and maintains an effective governance structure to ensure that risks and internal controls are appropriately managed. Thus, it includes risk associated to environmental impact. Given the prominence of corporate governance reforms, specifically, the role of the board of directors in Malaysia, the responsibilities of the board members in upholding the sustainability agenda is still unclear (Amran et al., 2013). There is limited evidence on the type of climate change reporting strategies employed by the Malaysian firms in response to the climate change issues and whether the disclosure of such climate change reporting has a positive impact to their performance. Therefore, this research attempts to examine the impact of corporate governance structure and composition towards climate change reporting strategies. At the same time, this research also attempts to assess the influence of firm's absorptive capacity to determine its moderating effect in the relationship between corporate governance and climate change reporting.

Absorptive Capacity

In general, studies on absorptive capacity are rather limited as most of the studies favored quantitative method over qualitative method in developing insight into the processes of absorptive capacity (Easterby-Smith, Graça, Antonacopoulou & Ferdinand, 2008). Due to this, this research attempts to investigate the influence of absorptive capacity as moderator using qualitative methods. It is widely accepted that the main duty of board members and key management team is to increase the firm value by optimizing the utilization of the resources and abilities. Apart from that, they are also duty bound to enhance the firm's resource base for the future challenges. From the perspective of Resource-Based View Theory, a firm is made up by arrays of unique resources (Barney, 1991). If the resources are wisely utilized and exploited in a controlled manner, a competitive advantage situation can be created for the firm. Hence, the ability to understand, develop and leverage on those resources is important for the firm if the firm wants to outperform their competitors in the market (Ooi, 2016).

A firm's absorptive capacity is defined as the "ability to recognize the value of new, external information, assimilate it, and apply it to commercial ends" (Cohen & Levinthal, 1990, p.128). Meanwhile, from the viewpoint of Resource-Based View Theory according to Barney (1991), a resource is considered unique or distinct if it possesses features such as non-substitutable, valuable and rare and costly to imitate. Resources that are carefully exploited may impact the corporation's performance. As such, in line with Resource-Based View Theory's perspective, it can be assumed that absorptive capacity is one of the unique and distinct resources which the firm possesses. However, Cohen & Levinthal (1990) explained that having "prior related knowledge" is the prerequisite to capitalize absorptive capacity. From the viewpoint of Knowledge-Base Theory – an extension of Resource-Based View Theory, knowledge is emphasized as the most "advantageously important resources" that the firm can have. Therefore, it is not surprising that Lewin, et al., (2011) argued that firms can improve or add to its existing capability if they are able to learn as well as create new innovation from the new knowledge acquired. If the absorptive capacity is corporatism's specific, idiosyncratic, complex, unobservable, and difficult to imitate they are the source of competitive advantage (Barney, 1991). New knowledge can be acquired through many means, for example, by hiring new personnel, contracting for consulting services, or even through corporate acquisitions. However, a firm's absorptive capacity does not simply depend on the firm's direct interface with the external environment. It also can also be acquired through transfers of knowledge across and within sub-units. According to Cohen & Levinthal (1990), absorptive capacity of a firm may be created as a byproduct of its investment in R&D. Hence, there is a possibility that firms that

invested heavily in R&D are those who are able to capitalize the new and external information to create competitive advantages.

According to Petti & Zhang (2013) greater absorptive capacity leads to greater technological entrepreneurship and performance. Galbreath, et al., (2014) concurred with such notion when they found that absorptive capacity of a firm is positively correlated with the firm's climate change innovation and outcomes. As such, absorptive capacity can be considered as one of the probable stimuli that may affect the extent of disclosure of climate change information by the firm. Absorptive capacity can also boost the corporation's capacity to adapt to changes (Lewin et al., 2011). Apart from adaptive capacity, absorptive capacity also encompasses the notion of mitigative capacity of the firm (Juhola et al., 2013). Hence, absorptive capacity can also function as the moderating or mediating effect to a range of phenomena relating to firm-level innovation, adaptation, mitigation and performance. At the same time, the level of absorptive capacity may also moderate the speed, frequency, and magnitude of innovation or any changes internally.

Climate Change Reporting and Firm Performance

Firm performance is an objective measure of how well a firm utilizes assets from its primary mode of business to generate revenues. According to www.investopedia.com, this term is often used as a general measure of the firm's overall financial health over a given period of time, and can be used to compare similar firms across the same industry or to compare industries or sectors in aggregation. Meanwhile, in most of business and economic literatures, discussion on firm performance often refers to financial returns, such as profits, ROI, economic rents or shareholders returns (Harrison & Wicks, 2013). There are different types of stakeholders of a firm. Among them are trade creditors, bond holders, investors, employees and management. Each group has its own interest in tracking the firm's performance. One of the common sources of such information is the annual report. The main purpose of the report is to provide stakeholders with accurate and reliable financial statements which give an overview of the company's financial performance. For public listed companies, those statements are audited and signed by the leadership of the company along with a number of other disclosure documents. Although it is mandatory for public listed company to publish its annual report, issues such as timely publication and extent of disclosure are actually a reflection of the firms' corporate governance practices. It has been demonstrated in the past that increase in financial disclosure has a positive impact on the firm performance (Achoki, Kule & Shukla, 2016). This performance may be measured in terms of profit margin, rate or return on assets or in terms of increase in the company's stock valuation. Correlation between earnings and timely disclosures and disclosures in addition to annual reports has been widely recorded in the accounting literature. Miller (2002); Francis, Nanda & Olsson (2008) have shown that the earnings are positively correlated with the level of a firm's disclosure. Core, et al., (1999) stated that a corporation with a weak governance structure normally has a poor financial performance. Gompers, et al., (2003) studied the impact of corporate governance on firm's performance during the 1990s found that firms with better governance had a better overall financial performance. A study by Brown & Caylor (2004) also revealed governance factors are relevant for firm value. Cremers & Nair (2005) argued that robust external and internal governance mechanisms are associated with long-term accounting measures of a firm's performance. On the other hand, according to Core, et al., (2006), better governance practice does not outperform those firms with weak shareholder rights. Similarly, Bowen, et al., (2008) did not find any negative association between accounting discretion as a result of poor governance and firm performance when analyzing the relation between two variables.

Previous empirical studies on the relationship between environmental strategies and financial performance are mostly rooted in economics studies, focusing on external drivers such as issue on legitimacy (Wagner, 2005). However, not much is known on the organizational

operating mechanisms which motivate or encourage the adoption of environmental management practices or strategies as catalyst of competitive advantage (Wagner, 2005). Lack of study in this area may lead to misapplication of models which ignore the effect of such organizational mechanisms on both environmental strategy and competitive advantage (McWilliams & Siegel, 2000). Meanwhile, Atkin, Gilinsky & Newton (2012); Melnyk, Sroufe & Calantone (2003) found that enhanced environmental practices improved firm performance. In their studies, they predicted that by implementing climate change adaption and mitigation measures, it would contribute to two outcomes. First is the reduction of greenhouse gas emissions. Secondly, there would be improvement in firm performance. As climate change adaptation and mitigation efforts involve significant amount of investment, it is logical that such actions would only be undertaken if they made the business to become more competitive, improve performance, increase in reputations, as well as open access to new markets. Roman, et al., (1999) conducted a study that reviewed various literatures since the past 25 years on relationship between corporate disclosure and financial performance. They reported that 33 studies suggested on the existence of a positive relationship between corporate social performance and financial performance, while 14 studies revealed that such relationship has no effect or inconclusive and only five studies registered a negative relationship. Roman, et al., (1999) concluded that "the vast majority of studies support the idea that, at the very least, good social performance does not lead to poor financial performance". Nonetheless, such conclusion has to be treated with caution the results of those studies could be confounded by other variables that the authors might not have controlled for. The reality is, as Porter & Reinhardt (2007) had stated clearly, any high stake investment a result of the firm's response to climate change issues must produce positive performance and outcomes that benefit the firm and its shareholders. When dealing with issues on climate change that involves adaption and mitigation measures, it normally requires investments on the part of the firm, such as managerial time and expertise, finance and know-how (Slawinski & Bansal, 2012; York & Venkataraman, 2010). Given such investments, it is not surprising that firms expect to benefit from these which result a better performance in future.

Theoretical Framework of the Research

Figure 1 illustrates the overview of conceptual framework and theoretical basis applied in this research. The framework proposes that there is a relationship between a firm's corporate governance practices and the extent of climate change information disclosure made in the climate change reporting, and subsequently the extent of disclosure affects the firms' financial performance. In addition, the framework also predicts that the association between the corporate governance practices and extent of disclosure is affected by the level of the firm's absorptive capacity. The framework suggests that the elements of corporate governance are considered as internal stimulus that directly affects the extent of disclosure on climate change information which the firm made. The elements are the board size, the board independence, the CEO's education level, attributes of the CEO (namely the CEO's education background and environmental experience), board gender diversity (*i.e.,* participation of female directors in boardroom), and ownership structure (percentage of government-controlled institutional investor). This framework also recognizes that the level of absorptive capacity of the firm as an internal stimulus that have a direct effect to the climate change reporting. In addition, the framework also proposes that the absorptive capacity level of the firm has an effect to the association that exists between corporate governance elements and climate change reporting. Meanwhile, by applying both Resource-Based View Theory and Knowledge-Based Theory, it is reasonable to assume the firm that engage in climate change adaptive and mitigative action may experience better performance.

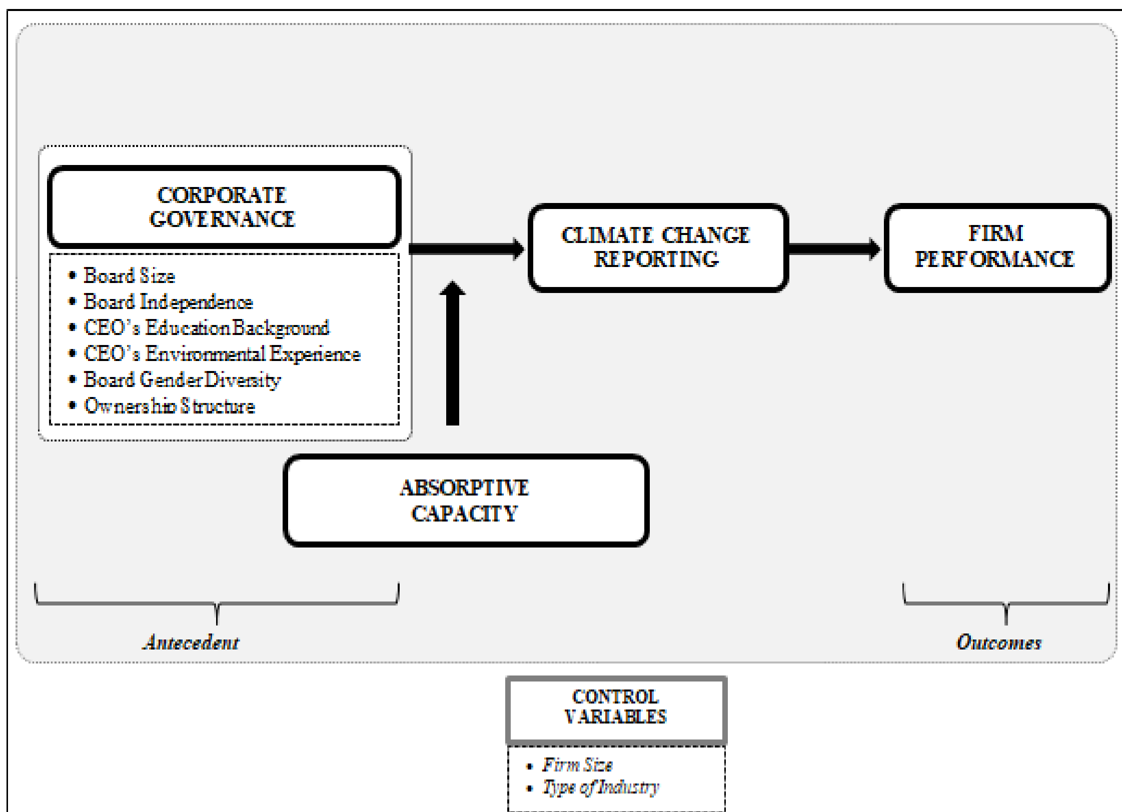

FIGURE 1
CONCEPTUAL FRAMEWORK

In brief, this proposition advocates that good corporate governance practices enhance the disclosure on the climate change information, and such association is stronger when the absorptive capacity of the firm improves. Hence, with the improvement in climate change reporting, the financial performance of the firm shows an improvement as well. Based on the theoretical framework in Figure 1 of the research, the following hypotheses have been developed:

H1: There is a positive relationship between the board size and climate change reporting
H2: There is a positive relationship between board independence and climate change reporting
H3: There is a positive relationship between the CEO's educational background and climate change reporting
H4: There is a positive relationship between the CEO's environmental experiences and climate change reporting
H5 : There is a positive relationship between board gender diversity and climate change reporting
H6: The is a positive relationship between ownership structure (i.e. government-controlled institutional investors) and climate change reporting
H7: Absorptive capacity moderates the relationship between board size and climate change reporting
H8: Absorptive capacity moderates the relationship between board independence and change reporting
H9: Absorptive capacity moderates the relationship between the CEO's educational background and climate change reporting
H10 : Absorptive capacity moderates the relationship between the CEO's environmental experience and climate change reporting
H11 : Absorptive capacity moderates the relationship between board gender diversity and climate change reporting
H12 : Absorptive capacity moderates the relationship between the shareholding structure (i.e., government-controlled institutional investors) and climate change reporting
H13 : There is a positive relationship between climate change reporting and firm performance

METHDOLOGY

There are six independent variables, one moderator and one dependent variable in this research. The independent variables, which represent corporate governance mechanisms are, (1) Board Size, (2) Board Independence, (3) CEO's Educational Background, (4) CEO's Environmental Experience, (5) Board Gander Diversity, and (6) Ownership Structure. Meanwhile, the dependent variable is the climate change reporting, and the absorptive capacity is the moderator for this research. Content analysis method has been utilised as the basic design for this research in analysing the climate change reporting. In this research content analysis is used to measure the level of climate change disclosure information, which is presented in annual report, climate change report and sustainability report issued by the company. For the purpose of this research, there are two ways of measuring the climate change reporting related issues. As the unit of analysis is the organization itself, there are two methods in content analysis being applied. The first is to look into the existence of the information in climate change reporting, whether the firm is making any reporting or not on climate change reporting. Therefore, the first measurement is "1" or "0". "1" is assigned when the climate change reporting information existed and "0" when the climate change reporting does not existed in the source of information. The second type of measurement that is suitable for this research is by employing the coding system based on their categories. The coding system technique encompasses the meaning of each word, sentence or even the paragraph itself. This is supported by Campbell & Abdul Rahman, (2010), which stated that the advantage of this measurement is, it capture the totality of the description and provide a better understanding on the findings. Therefore, by using this type of measurement climate change reporting could be encapsulated although the firm only reported in few words in their disclosure. This is perhaps a powerful content analysis method in order to give a better description on the meaning for each word, sentences or statement (Campbell & Abdul Rahman, 2010). The process of providing the coding was based on the categories adopted by Ooi (2016) coding sheets based on 26 indexes. The climate change information was recorded in the coding sheets and the given coding is either "1" or "0", where reflecting the information on climate change reporting is available or either vice versa. After completing the process of all 26 items, the amount was added and a total amount was recorded. This total represents the measurement of climate change reporting for the year ended 2016 for this research and finally concluded on the current extent and practice of climate change reporting.

Table 1 outlines all the 26 climate change information proposed for the index calculation as adopted from Ooi (2016). The measurement of climate change reporting are calculated by adding all the items at equal weight and the assessment are done by using the binary coding system, with "1" indicate there were information being reported regarding that particular item, while "0" represent an absent on the particular item. In this research, equal weight is assigned to the indices for the measurement as study done by Freedman & Jaggi (2005) found that there is no significant difference in the results using of either equal or differential weight. Therefore, if the firm reported all the items, the total score was 26. Then, the extent of climate change reporting is calculated based on the percentage of the formula presented in Equation 3.1.

$$= \sum \text{score of reporting items} / \text{number of items expected (26)}$$

Equation Error! No text of specified style in document.**.1: Climate Change Reporting Index**

This measurement is used to examine the current state of climate change reporting in Malaysian for the year ended 2016. By adopting the similar measurement proposed by Ooi (2016), however with some additional references in terms of the interpretation process, the answer of the current state of climate change reporting in Malaysian public listed companies is able to be measured. Nevertheless, this index can be further improved by other researcher who is interested to investigate climate change reporting in future.

Table 1
CLIMATE CHANGE REPORTING MEASUREMENT

Disclosure Items
Theme 1 - Governance
1. Existence of Board oversight for environmental, climate change or greenhouse gases affairs
2. Existence of Board Committee conducted periodic reviews of climate change performance
Theme 2 - Management Engagement and Actions
3. Existence of specific management responsibility team for environmental and climate change
4. Existence in Chairman/CEO statement on climate change or carbon footprint/ greenhouse gas emissions
Theme 3 - Strategic Analysis
5. Existence of link between climate change and company reputation or brand value
6. Existence company set absolute greenhouse gas emissions reduction targets as one of company's objectives to set absolute greenhouse gases emission reduction targets
7. Existence in company business strategy/operations to reduce greenhouse gas emissions and carbon footprint, minimize exposure to regulatory and physical risks, and maximize opportunity from changing market forces
8. Existence of specific requirements for suppliers/customers to reduce greenhouse gas emissions
9. Energy use/converse (reported as electricity & fuel use – coal, diesel, petrol, gas) with quantity
10. Existence target to reduce energy use
11. Existence of specific policy to develop energy efficiency by utilizing/acquiring low emission technologies
12. Existence of specific policy to purchase or develop renewable energy
Theme 4 - Greenhouse Gases Emissions
13. Company calculates and register greenhouse gas emissions savings and offsets from projects
14. Company conducts annual inventory of greenhouse gas emissions from operations
15. Company has set greenhouse gas emissions baseline
16. Company has third party verification process for greenhouse gas emissions data
17. Compliance with Global Reporting Initiatives ("GRI") or a comparable reporting guidelines to report its greenhouse gases emissions and trends
Theme 5 - Opportunity from Climate Change
18. Credits from Clean Development Mechanism ("CDM") projects under Kyoto Protocol
19. Description on other business opportunity from climate change (related to products, service/technology, such as selling green energy, building or operating wind turbines, demand for lower emissions cars or other products, eco-friendly products, green or carbon neutral home loans, credit cards and other products)
Theme 6 - Risk from Climate Change
20. Current/future increased cost of energy related to climate change
21. Potential future litigation, carbon tax, or legal action related to climate change
22. Implication of increased insurance premium due to climate change
23. Implications of physical changes (floods, droughts, strong wind, heat wave, storms, forest fire, changes in weather pattern, increased/decreased rainfall, rising sea level, availability of water) disruptions to business
Theme 7 - Future Outlook and External Affairs
24. Collaborations or work with government and other organization in climate change related projects
25. Promote climate friendly behavior by raising awareness through environmental sustainability education / campaign
26. Provide product information (emissions reduction information) to customers through product labeling,

For measurement of firm performance In this research, a simulation of three (3) variables is used as proxy as firm performance. The three (3) variables, which are all financial in nature, are as follows:

(i) ROA (profit/total assets);
(ii) Sales (total sales for the year); and
(iii) Profitability (profit margin, *i.e.,* profit/sales).

In this research, the absorptive capacity is measured using the model adopted by Galbreath, et al., (2014); Cohen & Levinthal (2001). Resource-Based View Theory suggests that resources, assets, capabilities and competencies that uniquely combine to put these resource and

assets to productive use (Barney, 1991; Black & Boal, 1994; Galbreath, 2005). However, in applying the concepts adopted by Galbreath's (2011, 2014) for measuring the firm's absorptive capacity, there is a need to evaluate the firm's degree of innovation, for example adapting or changing technologies, processes, specification, or inputs to solve problem (Van de Ven, 1986), and also capability of ideation (idea generation) and output (implementation) (Anderson & King, 1993). There are studies that found that R&D investment to be as an antecedent to absorptive capacity (Murovec & Prodan, 2009). As Cohen & Levinthal (2001) stated that absorptive capacity is a by-product of R&D, and hence it is considered as central to the development of absorptive capacity. Therefore it is not surprising that R&D investment cost is widely used as a proxy for absorptive capacity (Volberda, et al., 2010). However, Godfrey & Hill (1995) are critical toward the proposal to use a simple proxy (*i.e.,* R&D cost) for such a complex construct like absorptive capacity, given that R&D investment is more a static resource than a process or capacity of the firm. After considering the merits and demerits of using R&D cost as proxy to absorptive capacity, this research adapted the previous research method used by Delmas, Hoffmann & Kuss (2011) by viewing the R&D investment in annual report and sustainability report, which relates to mitigative and adaptive towards climate change issues, as proxy of absorptive capability of a firm. According to Delmas, et al., (2011), the investments made by firm in R&D represent four main related steps that define absorptive capacity as described by Todorova & Durisin (2007), namely knowledge acquisition, knowledge assimilation, knowledge transformation and knowledge exploitation. Therefore, R&D cost is suitable to be used as proxy for absorptive capacity in this research. In addition, R&D cost is also chosen as variable to represent absorptive capacity partly due to practicality and pragmatic of execution. Therefore, for the purpose of this research, the measurement of absorptive capacity, in order to make it more representatives and fair, is calculated based on the amount of R&D expenditures and expenses (in both the balance sheet and income statement from the annual report, *i.e.,* from the both assets and expenses figure disclosed by the firm) as a percentage of total sales. This percentage is used as the proxy of the firm's absorptive capacity. This measurement is used as it is consistent with the findings of study by Morbey & Reithner (1990), where they found that there is a strong relationship exists between R&D intensity and subsequent growth in sales in a firm (*i.e.,* R&D expenditure per dollar of sales). Finally this research applied PLS in analyzing the data collected using the two techniques explained in the earlier section, which covers both explorative and predictive nature (Hanseler et al., 2009) and suitable for this types of research which have small sample size, lack of data distribution and predictive/ formative measures (Ooi, 2016).

FINDINGS

All the findings for the hypotheses were tested and the summary is presented in Table 2. Out of the 13 tested hypotheses, only seven (7) hypotheses are supported, while the results of various statistical techniques applied on the remaining six (6) hypotheses did not support such hypotheses. Hypotheses H1 until H6 are the measurements of the relationship between corporate governance and climate change reporting. Only four (4) out of six hypotheses are supported, namely the CEO's education level, CEO's environmental experience, the number of female directors in the company and the percentage of institutional investors' shareholding in the company. Another two (2) hypotheses, *i.e.,* the board size and percentage of independent directors in the company, does not contribute to the company's willingness to voluntarily report on climate change issues. Two (2) control variables in the model were tested, namely firm size and type of industry. For firm size, market capitalization of the public listed company was used as the proxy of the company's size. The result of the test shows that the company's size it does not have any effect on public listed company's extent of climate change reporting. However, the second control variable, namely the types of industry (*i.e.,* environmental sensitive industries) does have a significant relationship with climate change reporting.

Table 2
SUMMARY OF HYPOTHESES

No	Hypotheses	Result	t-value
H1	There is a positive relationship between the board size and climate change reporting	Not Supported	1.343
H2	There is a positive relationship between board independence and climate change reporting	Not Supported	0.755
H3	There is a positive relationship between the CEO's educational background and climate change reporting	Supported	5.225
H4	There is a positive relationship between the CEO's environmental experiences and climate change reporting	Supported	4.310
H5	There is a positive relationship between board gender diversity and climate change reporting	Supported	2.413
H6	The is a positive relationship between ownership structure (*i.e.,* government-controlled institutional investors) and climate change reporting	Supported	2.008
	Moderating Effect		
H7	Absorptive capacity moderates the relationship between board size and climate change reporting	Not Supported	1.085
H8	Absorptive capacity moderates the relationship between board independence board size and the extent of climate change reporting	Supported	1.840
H9	Absorptive capacity moderates the relationship between the CEO's educational background and climate change reporting	Not Supported	0.420
H10	Absorptive capacity moderates the relationship between the CEO's environmental experience and climate change reporting	Supported	1.775
H11	Absorptive capacity moderates the relationship between board gender diversity and climate change reporting	Not Supported	0.949
H12	Absorptive capacity moderates the relationship between the shareholding structure (*i.e.,* government-controlled institutional investors) and climate change reporting	Not Supported	0.929
	Climate Change Reporting - Firm Performance		
H13	There is a positive relationship between climate change reporting and firm performance	Supported	6.221

t = > 1.65 (10% significance level)

The research applied absorptive capacity as moderator in the model in the relationship between corporate governance and climate change reporting (*i.e.,* hypotheses H7 to H12). The research result reveals that absorptive capacity has a significant relationship with climate change reporting. However, as moderator, the results reveal that absorptive capacity only have significant moderating effect towards two (2) out of six (6) of the relationships between corporate governance and climate change reporting, namely, CEO's environmental experience and the board independence. Finally, test results on the relationship between climate change reporting and the public listed companies' performance indicate that hypotheses H13 show significant results. This reveals that climate change reporting affects the firm performance.

CONCLUSION

This research used secondary data of top 150 public listed companies by market capitalization as a sample to examine the relationship between corporate governance and climate change reporting. The six (6) components of corporate governance examined were board size, board independence, CEO's educational background, CEO's environmental experience, board gender diversity and ownership structure. A theoretical framework that incorporated three theories, namely Resource-Based View Theory, Knowledge-Based Theory and Legitimacy Theory, was developed to improve the understanding of the relationship between corporate governance and climate change reporting. The model also includes the element of firm's absorptive capacity as a moderator to such relationships. In addition, the model also incorporates the assessment of impact of climate change reporting to the firm performance. In essence, the framework developed for this research predicts that through the implementation of good

corporate governance practices, it will lead to better climate change reporting, which in turn will lead to better firm performance. The results reveal that four (4) out of the six (6) corporate governance components, namely CEO's educational background, CEO's environmental experience, board gender diversity (percentage of female directors in the boardroom) and ownership structures (percentage of shareholding by government-controlled institutional investors), have positive significant relationships with climate change reporting. In addition the research result also reveals that there is existence of significant positive relationship between firm's absorptive capacity and climate change reporting. The research findings also indicate that firm's absorptive capacity have significant moderating effect to the relationships between corporate governance and climate change reporting, specifically the association between board independence and climate change reporting, as well as CEO's environmental experience and climate change reporting. This research also reveals that there is a positive strong relationship between climate change reporting and the firm performance.

In conclusion, it is found that adopting good corporate governance practices will positively lead to the firm to be more vigilant on issue concerning climate change, which prompted the firm to embark in climate change adaptive and mitigative initiatives to address the related issues that may affect the firm's going concern, hence more comprehensive climate change reporting being produced. The ability to be innovative and creative in developing such climate change adaptive and mitigative action, in turn leads to the better firm performance, which will be beneficial to all the stakeholders of the firm.

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