

**Faculty of Business**

**Board Diversity and Environmental Disclosure Practices of Malaysian Public  
Listed Companies**

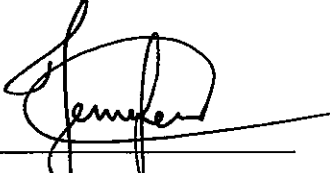
**Jennifer Chong Lai Yee**

**This thesis is presented for the Degree of  
Master of Philosophy (Accounting)  
of  
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### DECLARATION

To the best of my knowledge and belief, this thesis contains no material previously published by any other person except where due acknowledgement has been made. This thesis contains no material which has been accepted for the award of any other degree or diploma in any university.

Signature:   
Jennifer Chong Lai Yee

Date: 15/11/18

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## **ABSTRACT**

The trend in environmental awareness has led to a growing demand for environmental accountability by organisations. Environmental disclosure practices are a means of communication with the stakeholders about the impact of an organisation's action on the environment. This thesis investigates the level of environmental disclosure of Malaysian listed companies over a period of three years from 2014 to 2016. Specifically, this thesis aims to examine the influence of board diversity on the level of environmental disclosure of Malaysia listed companies from 2014 till 2016. Resource dependence theory is used as the theoretical framework to explain the association between board diversity and environmental disclosure by Malaysian companies.

The level of environmental disclosure is measured by an index comprising 45 items. Data is hand-collected from the annual reports or stand-alone sustainability reports of sample companies from the environmentally sensitive industry sectors. Using stratified random sampling approach, 150 sample companies listed on Bursa Malaysia Stock Exchange are selected for each study period. This translates to a total of 450 company-year observations which permit panel data set for the quantitative empirical analysis conducted in this thesis.

There is a statistically significant increase in the level of environmental disclosure over the three-year period. The panel regression results show that younger directors and foreign directors on board are negatively associated with the level of environmental disclosure, after controlling for company-specific attributes. The findings are not consistent with resource dependence theory tenets. In the context of Malaysia, younger directors and foreign directors may not have adequate local knowledge and familiarity with the environment in which the company operates. Furthermore, the small representation of these groups of directors does not reach critical mass to start influencing board disclosure of environmental information.

The findings of this thesis have implications for Malaysian policy makers and regulatory bodies in mandating and improving the quality of environmental disclosure. It will facilitate decision making process by stakeholders who will be able to understand the environmental impacts of company operations and any initiatives that have been undertaken by companies to mitigate environmental issues. The findings will also have implication for business executives in enhancing the corporate governance structure regarding the extent to which the characteristics of board diversity can influence environmental disclosure.

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## LIST OF ABBREVIATIONS

<b>AICD</b>	Australian Institute Of Company Directors
<b>BLUE</b>	Best Linear Unbiased Estimator
<b>CEO</b>	Chief Executive Officer
<b>CER</b>	Corporate Environmental Reporting
<b>CR</b>	Corporate Responsibility
<b>CSR</b>	Corporate Social Responsibility
<b>DOE</b>	Department Of Environment
<b>EDI</b>	Environmental Disclosure Index
<b>EIA</b>	Environmental Impact Assessment
<b>ESD</b>	Education For Sustainable Development
<b>ESG</b>	Environmental, Social And Governance
<b>F4GBM</b>	FTSE4Good Bursa Malaysia
<b>FDI</b>	Foreign Direct Investment
<b>FEM</b>	Fixed Effects Model
<b>GDP</b>	Gross Domestic Product
<b>GHG</b>	Greenhouse Gas
<b>GLC</b>	Government-Linked Companies
<b>GLS</b>	Generalised Least Squares
<b>GRI</b>	Global Reporting Initiatives
<b>GTFS</b>	Green Technology Financing Scheme
<b>LM</b>	Breusch-Pagan Lagrangian Multiplier
<b>MASB</b>	Malaysian Accounting Standards Board
<b>MBA</b>	Master Of Business Administration
<b>MCCG</b>	Malaysian Code Of Corporate Governance
<b>NIP</b>	National Integrity Plan
<b>OLS</b>	Ordinary Least Squares
<b>PLC</b>	Public Listed Company
<b>R&amp;D</b>	Research And Development
<b>RDT</b>	Resource Dependence Theory

<b>REM</b>	Random Effects Model
<b>TBL</b>	Triple Bottom Line
<b>UNFCCC</b>	United Nations Framework Convention On Climate Change
<b>VIF</b>	Variance Inflation Factor

### **LIST OF WORKS RELATED TO THIS THESIS**

1. 'Board Diversity and Environmental Disclosure Practices of Malaysian Public Listed Companies' November 6, 2017, Borneo Research Education Conference, Curtin University, Malaysia.

Note: Note: The paper presented is based on the results obtained from Ordinary Least Square (OLS) regression analysis using one year data.

2. 'Board Diversity and Environmental Disclosure Practices of Malaysian Public Listed Companies' July 4, 2017, 5<sup>th</sup> Postgraduate Borneo Research Colloquium 2017, Universiti Malaysia Sarawak.

Note: The paper presented is based on the literature review of corporate board diversity and corporate environmental practices of Malaysian companies.

## CHAPTER 1. INTRODUCTION

### 1.1. Background and Motivation of the Study

The establishment of business has come a long way with profit maximization still remains as the main goal today for majority of the entities to deliver to their shareholders. Over time, businesses have increasingly subjected to greater scrutiny due to societal awareness and concern for the environmental impact of businesses. A significant increase in Greenhouse Gas (GHG) emissions from the business operation of 288663 Gg CO<sub>2</sub>eq in year 2005 to 290230 Gg CO<sub>2</sub>eq in year 2011, as highlighted in the Biennial Update Report to the United Nations Framework convention on Climate Change (Ministry of Natural Resources and Environment Malaysia 2015). Global environmental threats such as global warming, pollution and climate change currently faced by the world are largely driven by the unsustainability pattern of wealth creation and distribution. The escalation of severe climate change will have adverse effect on the corporate businesses and assets (Babiak and Trendafilova 2011).

The environmental concerns have led to the resurgence of interest among the public, governments, and corporations alike of how business entities should conduct its operations. Homroy and Slechten (2017) indicate that the effect of business daily activities and productions on the environment has alerted the environmentalists and governments of the necessity to promote sustainable practice in their business operations. Stringent regulations and protocols have been used resulting in increased compliance, lawsuits, and costs. Corporations have come to realise that these developments are opportunities for competitive advantage and are embracing the concept of corporate sustainability from a strategic perspective. Michelon, Pilonato, and Ricceri (2015) emphasise the importance of improved environmental practices and corporate governance, which play a significant role in enhancing sustainability of a company.

From 1960 to the late 20<sup>th</sup> century, there were three pressure waves from the public that have shaped the environmental agenda (Henriques and Richardson 2004; Elkington



2013). In the early 1960s, the First Wave 'Limits' focuses on the compliance on environmental legislation after encouraging minimal environmental impacts and natural resource demands. Due recognition of the need to protect environment in this first wave began with the land conservation efforts. The Second Wave 'Greens' began in 1988 where the 'Greens' pressure wave encouraged sustainable development process through new production technologies and products. The concern over ozone depletion and rainforest destruction drove a new movement into 'Green Consumerism'. The Third Wave 'Globalisation' that began in 1999 heightened the recognition on sustainable development and came to a realisation that sustainable development requires profound changes in the governance of corporations and in the whole process of globalization, putting a renewed focus on government and civil society. Concomitantly, the corporations and governments are evolving through different stages in response to the three waves of public pressure to create a more sustainable form of wealth creation or also known as 'chrysalis economy' (Henriques and Richardson 2004; Elkington 2013).

The environmental dynamic continues to evolve with the emerging Fourth Wave of environmental innovation, which impacts the businesses than ever before. The Fourth Wave solutions are driven by innovation applying cutting-edge technologies to complement the environmental initiatives of the previous waves. While technological innovations can increase efficiency and reduce costs for businesses, they can be used in tandem to lower resource consumption, decrease pollution and greenhouse gas emissions. As the current pattern of wealth creation possibly has a stake in damaging the environment and causing environmental problems, under the current Fourth Wave of environmental innovation the corporations and governments are being pressured to form partnership to drive greater alignment between business and environmental goals.

The trend in environmental awareness has led to a growing demand for environmental accountability by organisations. To complement the waves of environmentalism and sustainable development effort, the concept of 'triple bottom line' (TBL) reporting is coined in 1994 (Elkington 1994). The TBL encompasses and monitors actions that contribute to the three facets of sustainability: economy, social and environmental. The

environmental dimension of TBL recognises the impact of the operation of business on the environment. By integrating environmental sustainability practices into corporate reporting, a company can maintain the license to operate in the society. Barton and Wiseman (2014) assert that sustainability and profitability are not mutually exclusive. Presently, the phrase sustainability reporting based on Global Reporting Initiative (GRI) criteria is popularly adopted by companies throughout the world. The GRI puts TBL reporting into a format that promotes “clarity, accuracy, usefulness, comparability, and influence” (Stenzel 2010). The GRI guidelines help an organisation manage its overall impact on the TBL. Hence, sustainability reporting (TBL reporting or CSR reporting) is an intrinsic element of integrated reporting that merges both financial and non-financial performance of an organisation (GRI 2018).

In response to pressures exerted by various stakeholders or constituencies that demand companies to embed environmental sustainability practices into their business strategies, environmental reporting is posited as a corporate management attempt to manage the public’s impression of its environmental performance (Neu, Warsame and Pedwell 1998). Environmental reporting and disclosure practices are a means of communication with the stakeholders about the impact of an organisation’s action on the environment. According to Berthelot, Cormier, and Magnan (2003), corporate environmental disclosure refers to a set of information items that relate to a company’s past, current and future environmental management activities and performance.

Corporate environmental disclosure reflects an economic decision whereby the management identifies various costs and benefits to be derived from the provision of additional information. According to Cowton and Sandberg (2012), the environmental performance of the companies affects the decision of the investors who will consider the non-financial performance of the companies along with the traditional measure of the company performance. The profound importance of providing environmental information of the company’s daily operation is emphasised when the investors especially green investors analyse companies according to the policies pertaining to the adoption of green technology, climate change, greenhouse gas emission, waste

management, and water management. Amran et al. (2013) indicate that companies with higher disclosure in environmental information of their business operations tend to attract more foreign funds to invest in their companies. Said, Zainuddin, and Haron (2009) echo that the companies that adopt environmental disclosure practices attract investments to their companies, as environmental disclosures enhance financial performance, decrease the operating costs, increase the company reputation and encourage customers' loyalty.

Disclosure of corporate environmental information in annual reports augurs well with the nation's sustainability agenda, which in turn, aligns with the United Nations Sustainable Development Goal. According to Aragón-Correa, Marcus, and Hurtado-Torres (2016), the major purpose of disclosure is the legitimization of a company's existing practices whereby the environmental disclosure is a way of obtaining a license for the company to operate. The disclosure of environmental information could potentially maintain and enhance the company's legitimacy of its operation in the society. Environmental disclosure continues to be an important area of research. A popular field of research is related to the corporate and the country-specific determinants of environmental disclosure (Cormier and Magnan 1999; Berthelot, Cormier and Magnan 2003; Eljayash 2015).

Burgwal and Vieira (2014) state that the country rules and legislation, and the reporting practices can influence the level of environmental disclosure. They note that companies have the tendency to generate higher environmental disclosures in regulated countries; mainly the United States, Canada and United Kingdom; due to the mandatory environmental reporting and the increased demand by the stakeholders. In Malaysian context, the level of environmental initiative and reporting in Malaysia is relatively low compared to the developed countries (Belal and Momin 2009). Romlah, Takiah, and Nordin (2002) report that a mere 20.4% of public listed companies in the environmentally sensitive industries disclosed environmental performances in year 1999 annual reports. Prior studies reveal that Malaysian companies are gradually responding

to the worldwide expectation for social and environmental reporting (Ahmad and Haraf 2013; Saleh, Zulkifli and Muhamad 2010).

The Malaysian regulatory bodies have taken proactive steps to improve CSR reporting since 2006. Among those initiatives implemented include the Bursa Malaysia's CSR framework in 2006, Corporate Governance Blueprint 2011 by Securities Commissions Malaysia, and the revised Malaysian Code of Corporate Governance (MCCG) in year 2012<sup>1</sup>. The latter two authoritative initiatives emphasise the duties of board of directors in ensuring the company's strategies are directed at promoting sustainability. In addition, the Tenth Malaysia Plan (2011-2015) highlights sustainable growth and recommendations on the reduction of GHG emissions in Malaysia (Prime Minister's Department 2010). Subsequently, Eleventh Malaysia Plan (2016-2020) is introduced to support green growth where the role of natural resources and environment is assimilated into the country's socio-economic development in providing a balance between development gains and biodiversity (Prime Minister's Department 2015). The two five-year development plans provide the stimulus for the companies in Malaysia to pursue environmental sustainability. Although Malaysian public listed companies are required to report social and environmental performance, there is no requirement of the type and extent of information disclosed in annual reports. Consequently, environmental disclosure remains a discretionary activity for the Malaysian listed companies in giving account of the environmental implications of doing business to external stakeholders.

Corporate governance has been at the forefront of establishing standards of corporate ethics and promoting accountability. Transparency and disclosure are essential elements of a robust corporate governance framework as they provide the base for informed decision-making by various stakeholders in relation to capital allocation, corporate transactions and performance monitoring (Fung 2014). The board composition is an essential corporate governance mechanism to dictate the strategic direction of the company. The board of directors plays a role in making operational and financial

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<sup>1</sup>MCCG 2017 is released by Securities Commission Malaysia and is effective on the 26 April 2017, replacing the 2012 code. However, the study period of this thesis is from year 2014 to year 2016. Thus, MCCG 2012 is kept as the most appropriate policy to explain this thesis.

strategies for the company, monitoring the effectiveness of company's performances including the disclosure and transparency policies. The board of directors contributes in the embodiment of a strong corporate governance framework. It is entrusted to meet its obligation of accountability to shareholders and stakeholders alike (Ayuso and Argandoña 2009). The board of directors needs to ensure the representations are balanced and reflect the company's stakeholders and other groups in society.

Extant literature suggests that board diversity contributes to the enhancement of sound corporate governance (Carter, Simkins and Simpson 2003; Carter et al. 2007; Kolk 2008). A diverse corporate board of director better understands the complexities of the environment and results in a more astute decision-making. Board diversity is defined as a variation of combined attributes, expertise and characteristics provided by each individuals of the board in terms of board process and decision making (Walt and Ingley 2003). Diversifying the board derives benefits such as effective decision making, better utilisation of the talent pool and enhancement of corporate reputation and investor relations by establishing the company as a responsible corporate citizen (ACCA 2018).

This thesis employs Resource Dependence Theory by Pfeffer and Salancik (1978) to explain corporate environmental disclosure decision of the management. A diverse board of directors with various experience, expertise, knowledge, and background enhances the ability of the board to acquire critical resources for a company. In order to have better sustainability practices within a company, it needs to have a comprehensive understanding of the multiple constituents and participants that formed the external business environment as well as their expectations and demands. Hence, a diversified board can help companies to improve relationship and links with diverse stakeholders, gather resources such as crucial information on industry and access to finance as well as better engagement in sustainability practices.

Given the central importance of the board of directors in shaping environmental sustainability agenda, board diversity that are associated with greater level of environmental information disclosure is worthy to be identified.

## **1.2. Problem Statement**

As mentioned earlier, Malaysian public listed companies are required to report social and environmental performance. Notwithstanding the mandatory environmental disclosure, the level of information disclosed in annual reports remains discretionary in nature in Malaysia. The rising importance of environmental disclosure has been observed all over the world. In Malaysia, there is a growing demand on the environmental information by the stakeholders but Belal and Momin (2009) and Amran et al. (2013) expound that the level of environmental reporting in Malaysia is relatively low compared to the developed countries. Shareholders may not be able to hold companies accountable for their environmental stewardship when the environmental information disclosure is low.

Diversity of corporate board members brings a heterogeneous perspective in decision making that could contribute to the improved environmental reporting. However, the existing evidence is limited to a single individual characteristic of board members, for instance, gender diversity (Bear, Rahman and Post 2010; Bernardi and Threadgill 2011; Fernandez-Feijoo, Romero and Ruiz 2012); there is a gap in the literature on the association between a collective of diverse characteristics of board members and the level of environmental disclosure.

## **1.3. Research Objectives and Questions**

The overarching aim of this thesis is to examine the level of environmental disclosure practices of public listed companies in Malaysia from 2014 to 2016. These periods are chosen as companies are expected to have responded to government's environmental initiatives and the enhanced corporate governance landscape.

The objectives of this thesis are:

1. to identify the types of environmental information disclosed in the annual reports of Malaysian listed companies;
2. to determine the level of environmental disclosures; and
3. to examine the determinants influencing the environmental disclosure decision of management.

Hence, this thesis seeks to answer the following research questions:

1. What are the types of environmental information disclosed in annual reports of Malaysian public listed companies?
2. What is the level of environmental disclosure by Malaysian listed companies?
3. What is the association between board diversity and the environmental disclosure by Malaysian listed companies?

#### **1.4. Research Gap**

Previous environmental disclosure studies employed content analysis method by way of counting the number of words, sentences or pages in the annual reports to measure the level of environmental disclosure (Burgwal and Vieira 2014). This counting method has inherent weakness due to the variation in the style of writing, page, and font size in communicating environmental information in the annual reports. Besides, the counting measurement cannot take into account the use of non-textual information (McMurtrie 2005). Instead, this thesis uses content analysis method where text is classified according to a disclosure instrument which classifies the information into the objectivity and verifiability of performance indicators of the GRI based disclosure index. The disclosure index facilitates the assessment of the quality of discretionary disclosures about environmental policies, performance and inputs. By classifying disclosures, the environmental information is quantified by identifying the presence of specific environmental items using dichotomous scoring. This approach is adopted in prior studies such as Al-Tuwaijri, Christensen, and Hughes II (2004), Clarkson et al. (2008), Burgwal and Vieira (2014), and Ibrahim and Hanefah (2016). Hence, this thesis provides an improved and comprehensive tool of measurement to examine the scope, depth and length of the level of environmental disclosure.

Prior studies regarding corporate technique of environmental disclosure are conducted in Anglo-Saxon and European countries (Manita et al. 2018; Ciocirlan and Pettersson 2012; Homroy and Slechten 2017). To the best of the researcher's knowledge, very few studies that examine board diversity and environmental disclosure have been conducted

in Malaysia. Malaysia provides an interesting setting for such research in view of its diverse ethnicity and rich endowment of natural resources available for rapid economic development to attain a high-income developed country status. Since June 2003, the Malaysian government allows foreign investors to hold 100.00 per cent of the equity in all investments. Foreign companies in the manufacturing sector are allowed to employ expatriates. The liberal equity policy and employment of expatriates demonstrate the presence of diverse demographic setting to facilitate this thesis.

The environmental disclosure literature to date has largely focused on the effect of individual company-specific or corporate governance characteristics on the social and environmental performance, for instance, the effect of gender diversity on environmental disclosure (Boulouta 2013; Hafsi and Turgut 2013). As a result, the understanding of the effect of diversity on environmental disclosure is incomplete. This thesis thereby aims to fill this knowledge gap and shed light on whether, and how, a collective of a variation array of corporate board diversity influences the level of environmental disclosure. This thesis examines the association between board diversity and the level of environmental disclosure practices of Malaysian public listed companies based on the Resource Dependence Theory. As board diversity reflects the diversity of the society and the community served by the companies, the social contract between a business and its stakeholders is strengthened which leads to an improvement of the strategic fit between the business and the environment.

### **1.5. Significance of the Research**

Disclosure is critical to the functioning of efficient capital market. A detailed and structured system of disclosure enables stakeholders to understand, and obtain accurate and reliable information of companies in order to make better decisions. This thesis is deemed important for the advancement of environmental disclosure literature. Companies in Malaysia are required to report environmental practices although there is no requirement on the type and level of information disclosed. This thesis enables the assessment of the actions taken by the companies in disclosing environmental information in this 'semi-discretionary' regime.



This thesis contributes to the measurement of environmental disclosure using content analysis method. The environmental disclosure index used in Clarkson et al. (2008) is adopted in this thesis. The index categorising environmental information into 'hard' and 'soft' disclosure items allows an in-depth analysis on the types of environmental information disclosed in the annual reports. An in-depth analysis allows the identification and verification of environmental information disclosed. Furthermore, the investors increasingly prefer to invest in companies that have greater accountability for their environmental stewardship. Hence, this in-depth analysis on the types of environmental information disclosed in the annual reports is significant to investors as this analysis reflects the companies' commitment in providing environmental information in the annual reports.

From the theoretical perspective, this thesis is important in shedding light on the application of resource dependence theory in examining whether the board diversity can increase the disclosure of environmental information in annual reports. A board of directors with diverse background and attributes can influence the corporate environmental disclosure decision.

Lastly, this thesis is of significance to nomination committee of the boards of directors in Malaysian companies in selection of board members, investors, mainly green investors with intention to invest in Malaysia and policy makers, particularly in the development of corporate governance in Malaysian public listed companies. The findings of this thesis serve as a point of reference to the nomination committee in assessing suitability of candidates of board members. The findings of this thesis give a different perspective to Securities Commission Malaysia to view diversity as a whole and enforce similar mandatory quota as the 30.00 per cent mandatory female directors on board by 2016 to other diversity variables.

The findings from this thesis are of significance to Malaysian policy makers such as Bursa Malaysia and the Securities Commission Malaysia in deliberating a policy on diversity in corporate boardrooms and minimum requirements for corporate

environmental disclosures. To the extent possible, they may have to consider changing disclosure requirements, laws and standards.

The different types of environmental information revealed in this thesis are of interest to investors who could base this information for investment decision-making purpose. Similarly, the findings are important to green investors who intend to diversify their investment portfolio in company that acknowledges the relevance of environmental, social and governance factors in their business operation. This is because green investors analyse companies according to their policies pertaining to green technology, climate change, greenhouse gas emission, waste management, and water management. As green investment is considered a subset of socially responsible investment that prioritizes the environmental aspects of business, it is crucial for this thesis to investigate board diversity and environmental disclosure practices.

#### **1.6. Thesis Outline**

The rest of this thesis is arranged as follows: Chapter 2 illustrates the corporate environmental reporting landscape in Malaysia; Chapter 3 provides the theoretical framework and literature review leading to the development of hypotheses; Chapter 4 explains the research methodology adopted in this thesis; Chapter 5 reports the descriptive statistics and panel data analysis results; Chapter 6 shows the additional analyses conducted; and Chapter 7 concludes this thesis by summarising the findings of the research, theoretical and practical implications, assumptions made, limitations and recommendations for future research.

## **CHAPTER 2. CORPORATE ENVIRONMENTAL REPORTING IN MALAYSIA**

### **2.1. Introduction**

This chapter reviews the corporate environmental reporting in Malaysia and the initiatives introduced by the government in enhancing the environmental practices of the companies. The milestones of the development of corporate environmental reporting in Malaysia from early 1980 until 2016 are outlined in this chapter. The rest of the chapter is structured as follows: Section 2.2 defines corporate environmental reporting; Section 2.3 reviews the corporate environmental landscape in Malaysia and the initiatives made by the government in stimulating environmental reporting in Malaysian companies; Section 2.4 illustrates the development of corporate environmental reporting in Malaysia; and Section 2.5 provides a summary of this chapter.

### **2.2. Definition of Corporate Environmental Reporting**

In carrying out daily business operation, a company needs to draw necessary resources from the environment for the company's survival. The environment is the sum of all surroundings of a living organisms comprising natural forces and other living things that give conditions for the growth and development along with the existence of companies in a society (De Geus 2002; Harper, Harper and Snowden 2017). This shows the interaction and the impact that business operations have on the environment. Hence, companies should play an important role in protecting the environment, as they are responsible for their actions and impact caused to the ecosystem.

The increasing societal environmental concern made possible by social media draws attention from the organisations to be more environmentally responsible. With the rampant growth of environmental issues, the demand from the stakeholders for the businesses to be accountable for their actions that damage the environment has risen (Dutta, Lawson and Marcinko 2012). Various policies and initiatives introduced by the government are necessary to encourage the companies in Malaysia to be socially and environmentally responsible in order to ensure the sustainability and the survival of the companies. These responsibilities are addressed through corporate environmental

reporting which is a part of CSR initiatives conducted by companies. The concept of CSR is promulgated in western countries in 1970s and is later introduced in Malaysia through multinational companies in 1980s (Teoh and Thong 1984).

CSR has been implemented as initiatives linking to company's business strategy. Roberts (1992) defines CSR as a policy of an organisation that identifies the concerns on the issues related to the society such as environment, human resources, community involvement, and product safety. According to Pérez (2015), CSR reporting reflects the information disclosed by the companies to communicate the social and environmental concerns in their daily business operation and interactions with the stakeholders. Adams (2004), Brammer and Pavelin (2006), and Burgwal and Vieira (2014) concur that companies should be taking responsibilities ethically, socially and environmentally by providing CSR disclosure.

Corporate environmental reporting is one of the aspects within CSR. The environmental information comprises information such as waste management, recycling programs, environmental control, the impact of the company's operations on the environment and the actions taken by the company to control the damages caused. As the public awareness on the importance of environmental protection increases, the companies should endeavour to disclose environmental information in their annual reports. Environmental reporting assists in establishing trust and maintaining legitimacy of a company in a society as it reflects corporate responsibility to the society from where companies generates added value and competitive advantage.

Campbell, Craven, and Shrivies (2003) state that the environmental reporting, also known as "green reporting", is part of the voluntary social reporting included in the annual report of the company. Generally, voluntary social reporting comprises value added statements, corporate social responsibility and accountability disclosures (Ahmad, Hassan and Mohammad 2003). As corporations are evolving alongside the rapid industry development, management tends to seek for short term economic benefits such as high profitability at the expense of the environment. This triggers the concern for the need of social and environmental disclosures (Bocken et al. 2014) in order to hold

companies accountable for environmental stewardship (Villiers and Staden 2011). Concomitantly, companies should embrace transparency and accountability in corporate reporting especially in the context of environment in which it operates; its relationship to the economy and society; in order to demonstrate company's business value and stewardship.

### **2.3. Environmental Initiatives in Malaysia**

Malaysia has benefited from its geographically blessed location at the crossroads of trade between East and West along the Strait of Malacca that is economically and politically important shipping lane in the world. Malaysia leverages its strategic location to emerge as one of the largest producers and exporters of rubber and palm oil. According to The Observatory of Economic Complexity (2018), Malaysia is the 20th largest export economy in the world. In 2016, Malaysia exported \$184 billion and imported \$156 billion, resulting in a positive trade balance of \$27.4 billion. In year 2016, the Gross Domestic Product (GDP) of Malaysia is \$296 billion and its GDP per capita is \$27,700.

Over the last few decades, Malaysia has been transforming its economy from overdependence on raw materials and agriculture to a relatively high tech, competitive nation. Using the 1992 revised HS (Harmonized System) classification, in year 2016, the top exports of Malaysia are integrated circuits (\$25.6 billion), refined petroleum (\$10.9 billion), palm oil (\$8.94 billion), semiconductor devices (\$7.98 billion) and computers (\$7.71 billion). In line with this growth, Malaysia has been gradually responding with the global environmental management practices and the growing pressure from the stakeholders due to its impact on the ecosystem. Hence, it is crucial for the companies in Malaysia to be transparent and accountable for their environmental responsibilities and impact of their activities to the society.

The increasing global trade in Malaysia reflects the dependence of Malaysia on foreign direct investment in supporting the country's economic growth (Amran and Haniffa 2011; Saleh, Zulkifli and Muhamad 2011). The growth of foreign direct investment into

Malaysia is averaged RM13, 485 million between 2008 and 2016, reaching the peak of RM37, 325 million in the fourth quarter of 2011.

The increasing foreign direct investment into a developing country can cause an impact on the environment. Copeland and Taylor (2013) discover that trade may encourage a relocation of polluting industries from countries with strict environmental policy to the countries with less stringent policy. These shifts cause a rise in global pollution or they may have chilling effect on environmental policy, as countries are reluctant to tighten environmental regulations due to the concerns over international competitiveness. For instance, international trade improves the environment of developed countries at the cost of exacerbating the environment of developing countries. The relocation of polluting industries from developed countries leads to a growth in carbon emissions in the developing countries. Ren et al. (2014) dictate that the commodities consumed by foreign companies cause a large part of carbon emission in China. In facing the demand from the stakeholders on the issue pertaining to environmental impact, companies ought to adopt CSR practices in order to ensure sustainability and access to global market.

Environmental protection laws and regulations in Malaysia dated back in 1935 when the Forest Enactment Act is enacted and incorporated in Malaysian legislation. Subsequently, other legislations are enacted such as Land Conservation Act 1960 and Environment Quality Act 1974. In addition, the government released the Environmental Impact Assessment (EIA) legislation in 1988 that mandates major development projects to conform to EIA (Briffett, Obbard and Mackee 2004). Besides, Malaysian companies adopt the ISO 14001 Environmental Management System standards to highlight the company compliance in terms of environment management (Nor 2000). Explicitly, these initiatives should dictate corporate behaviour and practices to be responsible in the environment in which the companies operate. To continue recognising the importance of environmental protection, new policies namely, the National Policy on the Environment and National Policy on Climate Change are introduced respectively in years 2002 and 2009. These policies integrate the economic development with environmental practices to ensure a balance between fiscal growth and environmental sustainability.

Malaysia continues to encounter environmental challenges in its quest to achieve significant economic growth primarily arising from an export-led development strategy. To show the country's commitment in achieving environmental sustainability, Malaysia pledged to reduce the carbon emission by 40% by the year 2020 compared to the year 2005 levels in 2009 during the 14th Conference of Parties meeting of United Nations Framework Convention on Climate Change (COP14) in Copenhagen, Denmark (Second National Communication 2010). Subsequently, various initiatives are introduced by the government to beef up the effort in achieving environmental sustainability. The Green Technology Financing Scheme (GTFS) is launched in 2004, where the green bank supports the purchase of the green machines financially (Razak 2004). Similarly, the Green Technology Policy is introduced in the year 2009 to strengthen the development of green technology in Malaysia.

To complement the government 'green' regulatory effort aligned with the increased demands and expectations from stakeholders, Securities Commission Malaysia introduced Corporate Governance Blueprint 2011 in reviewing the corporate governance structure in Malaysia. The role of board of directors in practicing good corporate governance and maintaining sustainable growth in the society is the main focus in this corporate governance revision exercise (Securities Commission Malaysia 2011). The Corporate Governance Blueprint 2011 has recommended the companies to include gender diversity into the board. According to prior studies, female directors contribute a different point of view to the board, who tend to be more supportive to the corporate environmental agenda (Bear, Rahman and Post 2010; Post and Byron 2015; Said, Omar and Abdullah 2013). Also, the government has required the companies to allocate a minimum of 30.00 per cent of the board seats to female directors by year 2016 (Securities Commission Malaysia 2011). The inclusion of female directors on board reflects a significant progress in the corporate governance of Malaysian public listed companies.

The Malaysian Code on Corporate Governance (MCCG) is introduced in March 2000 and later revised in 2007 where the roles and responsibilities of board of directors are strengthened. Based on the Corporate Governance Blueprint 2011, a revised MCCG 2012 is released in 2012 emphasising the board structure and composition in recognising the role of directors as active and responsible fiduciaries to ensure that the company's strategies promote sustainability. MCCG 2012 highlights the duties of the board in ensuring the disclosure of the company policies pertaining to environmental, social and governance (ESG) aspects of business and their implementation in the annual report and the corporate website. The comparison between MCCG 2007 and 2012 is provided in Appendix C.

FTSE4Good Bursa Malaysia (F4GBM) Index or also known as the Environmental, Social and Governance (ESG) Index is introduced in year 2014 where the performance of companies that demonstrates strong ESG practices are evaluated. The Malaysian companies are required to innovate and adopt more sustainable practices in conjunction with F4GBM. According to F4GBM Index, all constituents are required to meet internationally benchmarked criteria that measure items such as the effort to conserve environment, the impact of social responsibility initiatives on the community and the practice of good governance in making responsible and ethical decision. The index forces the companies to venture into non-financial perspective, for instance, the environmental and societal initiatives of the companies.

Furthermore, a credible rating is necessary to compare the ESG performance of the companies. The FTSE ESG Ratings form the engine for F4GBM as the companies are required to achieve a FTSE ESG Rating above a specific threshold for index inclusion in addition to pass certain additional screens set out in the F4GBM Index Ground Rules. FTSE ESG Ratings provide investors with flexible and granular data to understand the companies' ESG practices in various dimensions. The Ratings model is divided into Environmental, Social and Governance pillars, subdivided into 14 themes including a range of sustainability issues that concern the investors.



In December 2015, F4GBM Index shows 34 constituents, comprising PLCs from across the small, medium and large market capitalisation segments, which is an increase from 24 constituents in December 2014 when F4GBM is first launched. The number grows steadily to 38 constituents in June 2016. The index constituents are selected from the top 200 shortlisted companies on FTSE Bursa Malaysia EMAS Index and are reviewed in June and December annually (The Star 2015). The continuous increase in the number of constituents reflects the PLCs are gaining benefits from F4GBM and catalysing their efforts towards ESG best practices.

Malaysia has been contributing to the global effort to fight global warming by having climate resilient growth and increasing conservation of the ecological assets of the country. Environmental sustainability is given the attention in the comprehensive Sustainability Framework by Bursa Malaysia and the issuance of Sustainable Reporting Guide and Toolkits to propel the development of the nation. Under the Tenth Malaysia Plan (2011-2015), the Malaysian government initiated effort to reduce emission by climate adaption and mitigation measures. As a developing country with a sense of responsibility towards environment, Malaysia has attached great importance to the issue of climate change in the Eleventh Malaysia Plan (2016-2020) that focuses on green growth and sustainable development by adopting three strategies mainly, strengthening governance, increasing awareness for shared responsibility and establishing sustainable financing mechanisms. The Eleventh Malaysia Plan encourages socio-economic development in a sustainable manner which begins at the planning stage and followed by implementation and evaluation stages.

#### **2.4. Development of Environmental Reporting in Malaysia**

In accounting arena, in keeping with the development of environmental landscape, the Malaysian Accounting Standards Board (MASB) accentuates the significance of the preparation and disclosure of environmental information in annual reports (Buniamin 2010). The accounting standard-setting body gives prominence to the mandatory environmental disclosure for public listed companies by actively promoting environmental reporting in Malaysia. In addition, Malaysian Institute of Integrity and

the Companies Commission of Malaysia support the environmental reporting endeavour by raising awareness and conveying information on environmental reporting through road shows (Amran et al. 2013).

Further initiative to strengthen environmental reporting is the launch of Silver Book under the Government-linked Companies (GLC) Transformation Program in 2006. The Silver Book contains guidelines for GLC to engage in and report environmental activities in annual reports. This is in line with the CSR framework for public listed companies (PLCs) in 2006 where a set of guidelines is provided to assist the public listed companies in fulfilling corporate social and environmental obligations to the society and communicating environmental initiatives through annual reports or stand-alone sustainability reports.

Environmental sustainability initiative continues to upscale. Bursa Malaysia launches its Sustainability Reporting Guide and Toolkits in conjunction with amendments to its Main Listing Requirements in 2015. Under the new sustainability framework, listed companies are required to disclose any material economic, environmental and social risks, as well as opportunities arising from their operations. The Listing Requirements are amended to require disclosure of the statement of sustainability that covers material sustainability matters based on the GRI Guidelines. The new sustainability framework urges companies to be aware of the impact of environment, social and governance issues on the value and sustainability of companies' businesses. Companies may be motivated to disclose sustainability information in their annual reports in order to be recognised as responsible corporate citizen and be included in the FTSE4Good Bursa Malaysia Index.

The early stage of the initiative taken by Malaysian companies in responding to the expectation of stakeholders occurred in 1990 as only four companies initiated programmes for the benefit of the community (Ismail, Alias and Rasdi 2015). Following that, Alrazi, Sulaiman, and Ahmad (2009) dictate that the number of companies disclosed environmental information grows from 47.00 per cent in 1999 to 60.00 per

cent in 2003, and the number increases to 67.00 per cent in 2006. The increment in environmental disclosure is due to the relatively high environmental awareness.

There are four aspects in CSR reporting, namely environment, workplace, marketplace and community. Hamid and Atan (2011) expound that the environmental disclosure is lacking in annual reports. Prior studies concur and note that most of the companies disclose more information on community development and the least on environment performance (Amran et al. 2013; Rahman, Zain and Al-Haj 2011; Said, Omar and Abdullah 2013). The companies tend to publicise more on the community related activities compared to workplace, environment and marketplace. This is because the management of the companies has the tendency to allocate funds to business operations that bring short-term profit rather than spending on environmental practices to achieve long-term sustainability. Prathaban and Norasyida Abdul (2005) highlight that CSR reporting in Malaysian companies focus mainly on corporate philanthropy. Based on their findings, it is noted that an approximate RM82.1 million is donated to various charitable organisations, orphanages and the poor for a period of 18 months from July 2003 to December 2004.

As a developing country, Malaysia is suffering from deforestation that is caused by large-scale land development, construction of dam and logging. These harmful activities have led to a loss in biodiversity erosion. Nevertheless, the local environmental issues such as air pollution from industrial and vehicular emission and water pollution from raw sewage also endanger the natural ecosystem. With the current pattern of wealth creation that worsens the environmental and social problems, pressures are building on both the corporations and governments to make a transition to sustainable development through environmental reporting.

The widespread of media publicity on adverse environmental impacts of business operations, including the recent public outcry over the establishment of Lynas

Corporation’s rare earth refinery in Gebeng, Kuantan<sup>2</sup> shows a change observed in the values of society. This change reflects a desire towards a more socially responsible business especially in environmental reporting. Saleh, Zulkifli, and Muhamad (2010) and Ahmad and Haraf (2013) dictate that Malaysian companies are changing gradually to adapt to the society demands on environmental reporting.

With the increase of carbon emission after global financial crisis, the governments and corporations are pressured to adopt sustainability practices in the daily businesses (Peters et al. 2012). This is because the companies generally experience liquidity problems and significant falls in turnover during financial crisis. The companies are obligated to devise strategies in order to ensure the survival of the businesses. The companies consider global financial crisis as an opportunity to increase their philanthropic and ethical activities (Dias, Rodrigues and Craig 2016). The companies use environmental reporting as a long-term marketing strategy to mitigate any potential lack of trust stakeholders have in them and to ameliorate the consequences of the crisis (Yelkikalan and Köse 2012). In order to cope with the financial and economic downturn, companies need to focus on providing society’s demand; thus, environmental reporting provides social support needed by the companies and society to overcome the down turn.

To facilitate environmental disclosure, the Blueprint 2011 and the revised MCCG 2012, as stated in the preceding section, are introduced where the roles of board of directors provide mechanism in ensuring the disclosure of the company pertaining to ESG aspects of business.

Taken together, the milestones of Malaysia’s response to environmental protection and corporate environmental reporting are shown in Table 2.1.

**Table 2.1 Milestone of Corporate Environmental Landscape in Malaysia**

<b>Year</b>	<b>Environmental Initiatives</b>
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<sup>2</sup> Lynas Corporation is an Australian public listed company which set up a rare earth refinery in Kuantan, Pahang, Malaysia through its Malaysian subsidiary in late 2012 Bar (2011).

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<b>1935</b>	Forest Enactment Act 1935
<b>1960</b>	Land Conservation Act 1960
<b>1975</b>	Environmental Quality Act 1975
<b>2000</b>	Malaysian Code on Corporate Governance (MCCG)
<b>2002</b>	National Policy on the Environment
<b>2004</b>	National Integrity Plan (NIP) Government-linked Companies (GLCs) Transformation Program
<b>2006</b>	Mandatory environmental reporting in annual report Bursa Malaysia Guideline provides a guidance for PLCs in defining their CSR priorities, implementation and reporting The Green Book and The Silver Book
<b>2007</b>	Revised Malaysian Code on Corporate Governance (MCCG 2007) emphasises the roles and responsibilities of board of directors
<b>2009</b>	National Policy on Climate change Green Technology Policy COP15 indicates the Malaysia government's pledge to have a voluntary 40% reduction of carbon dioxide emission intensity by 2020
<b>2011</b>	Corporate Governance Blueprint 2011 by Securities Commissions Malaysia emphasises on the role of corporate board of directors in maintaining sustainable growth Tenth Malaysia Plan (2011-2015) highlights climate- resilient growth and enhancing the conservation of the nation's ecological assets
<b>2012</b>	Revised MCCG 2012 emphasises the duty of board of directors in ensuring the compliance with law and ethical value
<b>2014</b>	FTSE4Good Bursa Malaysia Index measures the performance of companies that demonstrate strong Environmental, Social and Governance (ESG) practices
<b>2015</b>	Sustainability Framework by Bursa Malaysia shows the amendments to Listing Requirements and issuance of Sustainable Reporting Guide and Toolkits Eleventh Malaysia Plan (2016- 2020) focuses on green growth and sustainable development

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## **2.5. Summary**

The awareness of the CSR increases gradually over the years since the introduction of CSR concept in Malaysia in the 1980s. The consistent effort of the government to implement various environmental policies and initiatives and the constant stakeholders' pressure has resulted in companies communicating environmental information in annual reports. The companies are challenged to be responsible to the stakeholders and accountable for the impact caused by the business operation on the environment. The focus of this thesis is to determine the association between the board diversity and the

level of environmental practices in Malaysian public listed companies. The following chapter offers the theoretical framework used in this thesis and the literature review, which leads to the development of hypotheses.

## **CHAPTER 3. THEORETICAL FRAMEWORK, LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT**

### **3.1. Introduction**

This chapter presents the theory, literature review relating to the corporate environmental disclosure and the formulation of hypotheses. Section 3.2 describes the theories used to explain corporate environmental disclosure. Section 3.3 explains how resource dependence theory can relate to corporate environmental disclosure. Section 3.4 sets out the research proposition of this thesis. Section 3.5 reviews the relevant literature on corporate board diversity and the level of corporate environmental disclosure practices along with the hypotheses development. Section 3.6 shows the conceptual schema on the testable hypotheses whilst Section 3.7 provides a summary of this chapter.

### **3.2. Theories Explaining Corporate Environmental Disclosure**

Prior studies use various theories to explain the influence of specific variables on corporate environmental disclosure. The underpinnings theory used in various studies differ accordingly (Monteiro and Aibar-Guzmán 2010). Most of the theories used to explain corporate environmental disclosure are the legitimacy theory (Aerts and Cormier 2009; Cho and Patten 2007; Patten 2002), the stakeholders theory (Deegan and Blomquist 2006) and the agency theory (Oh, Chang and Martynov 2011; Bear, Rahman and Post 2010; Habbash 2016).

#### **3.2.1. Legitimacy Theory**

Legitimacy theory is one of the most cited theories in explaining corporate environmental disclosure. Suchman (1995, 574) defines legitimacy as “a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions”.

The social contract between the organisation and society is achieved through a balance in societal values and organisational value. Milne and Patten (2002) expound that the

negative societal impressions on the companies arises when the companies fail to operate in accordance to the social contract as reflected by a difference in the values of societal and organisational. The social contract is broken when the society is not satisfied with the operations of the companies. This broken social contract is referred to as the legitimacy gap. The legitimacy gap may results in the difficulties of the companies in obtaining necessary resources, for instance, a reduction of demand by consumers for products or services from the companies, and suppliers may limit the supply of resources to the companies (Deegan, Rankin and Tobin 2002). Consequently, the companies strive to repair or compensate the broken contract in filling the legitimacy gap, thus, disclosing more environmental information (Burgwal and Vieira 2014; Deegan, Rankin and Tobin 2002).

In the context of disclosure, extant literature cites legitimacy theory to explain the managerial decision in corporate environmental disclosure (Nurhayati et al. 2016; Lai, Melloni and Stacchezzini 2016; Li et al. 2018). The disclosure is a function of the intensity of societal and political pressure encountered by the company. In response to the pressure exerted, the companies tend to provide more environmental information (Cho and Patten 2007). According to Abrahamson and Park (1994), annual report is used as a corporate communication medium that serves as a legitimating device to project selective impressions of the companies' environmental performances. The companies consider corporate environmental reporting in annual report as a useful device to reduce the effects of corporate events that are perceived to be unfavourable to the image of the companies (Deegan 2000). Consistent with the notion of legitimacy theory, companies seek to gain, maintain or repair their legitimacy through environmental disclosure.

The legitimacy theory fails to specify the theory adequately. For example, a company with legitimacy threats may legitimate its activities by adapting its output, goals and business operation to conform to prevailing definitions of legitimacy. Dowling and Pfeffer (1975) expound that the companies can be identified with symbols, values or institutions with a strong base of legitimacy through communication medium. The companies may seek to achieve legitimacy by appearing to be ethical when this



appearance may have little resemblance with the actual environmental performance of the companies.

Hence, legitimacy theory explains the operations of the companies are based on social contract with society and their survival and growth depend on legitimacy. This theory focuses on maintaining the congruence between society's and organisational objectives through corporate environmental disclosure.

### **3.2.2. Stakeholder Theory**

The stakeholder theory highlights the communication with different stakeholder groups. Freeman (1983) defines stakeholders as any group or individual who are capable of affecting and affected by the achievement of the companies' objectives. Ansoff (1965) highlights the main objective of the company is to attain the ability to balance the conflicting demands of various stakeholders in the company.

The stakeholder theory developed by Freeman (1983) emphasises the role of management in protecting the rights of the stakeholders. According to stakeholder theory, the society consists of various stakeholder groups that have unequal power in influencing the operations of the companies, and share the common concerns on the corporate environmental performance (Roberts 1992). The stakeholder's power to influence corporate management is seen as a function of the stakeholder's degree of control over critical resources for the operations of the business entities (Ullmann 1985). Burgwal and Vieira (2014) dictate that a higher stakeholder power results in a higher adjustment in the companies' operations in accordance to the stakeholders' demands. Thus, companies strive to address the stakeholder demands accordingly in order to acquire resources for their business activities.

With reference to disclosure, prior literature cites stakeholder theory to explain managerial decision making in disclosing environmental information (Guenther et al. 2016; D'Amico et al. 2016; Font, Guix and Bonilla-Priego 2016). Roberts (1992) expounds that corporate environmental disclosure is part of the dialogue between the company and the stakeholders in negotiating the social contracts. The corporate

environmental disclosure is useful in developing and maintaining satisfactory relationships with the stakeholders. Hence, given certain levels of stakeholder power, the companies tend to disclose more environmental information when the corporate environmental disclosure is viewed as an effective management strategy in dealing with the stakeholders.

Ambler and Wilson (1995) concur that stakeholder theory lacks in the understanding of company's purpose and distribution of benefits. The theory suggests that all stakeholders should benefit from the action of the companies. However, this is unmanageable as different stakeholder groups have different commercial purposes. Besides, the stakeholder theory provides vague criteria in the distribution of benefits. The stakeholder theory proposes that social, rather than market should determine the allocation of resources to the competing stakeholders. In fact, market forces drive the distribution of benefits where the business alignment is formed when there is mutual interest between two parties.

Hence, stakeholder theory states that companies are affected by stakeholder actions and thus, must attend to their interests. This theory focuses on the organisation's relationships with specific external actors in order to drive corporate environmental disclosure.

### **3.2.3. Agency Theory**

Agency theory studies the relationship between 'principals' (person or organisations who employ another party to conduct specific task) and 'agents' (those who conduct the task). Agency theory suggests the potential for conflicts of interest that arise from the separation of ownership and control in organisations (Berle and Means 2017; Fama and Jensen 1983).

According to Berle and Means (2017), agency theory is often used to explain the relationship between the owners and managers of large publicly listed companies and various other agency relationships such as employers-employees and suppliers-buyers. The agency theory addresses the agency problem arises from the conflict of interest between the principles and agents or the inability of the principal to effectively monitor

the conduct of the agent, and methods to overcome agency problem through various governance mechanisms (Spence and Zeckhauser 1978; Jensen and Meckling 1976; Amihud and Lev 1981; Eisenhardt 1985). When the corporate management have their personal goals that are in contrast with the owner's goal of maximization of shareholder wealth, a potential conflict of interest exists between the two parties due to self-interested behaviour.

In the context of disclosure, prior literature cites agency theory to explain managerial decision making in disclosing environmental information (Bear, Rahman and Post 2010; Oh, Chang and Martynov 2011; Habbash 2016). When the ownership and control is separated, the management tends to put their self-interest at the expense of profit maximization, thereby creating 'agency' costs. In order to reduce agency costs inherent in the separation of ownership and control, the management are monitored through economic incentives to protect the shareholder interest. When the incentives are aligned with shareholders' interest, the management are encouraged to disclose more environmental information (Fama and Jensen 1983; Jensen and Meckling 1976).

The agency theory has limitation in providing a full explanation of environmental reporting. Eisenhardt (1989, 71) dictates "agency theory presents a partial view of the world that, although it is valid, also ignores a good bit of the complexity of organisations". The theory relies on narrow assumptions of human nature and motivations and fails to capture the wide variety of non-economic aspects in management and shareholders relationships.

Hence, agency theory dictates that managers as agents have distinct incentives and objectives from their principals. Corporate environmental disclosure is used to drive an alignment of interest between agents and principals.

The theories discussed in the preceding paragraphs focus on organisations and macro environments, and organisations and their key stakeholders, as well as the heterogeneous agents within organisations. However, this may limit the scope of relevant environmental disclosure and its intended purpose. On the other hand, resource

dependence theory provides a more comprehensive perspective on environmental disclosure as the theory analyses the relationship between the organisations and the external parties on which they depend on to acquire resources. This theory enhances the accountability through corporate environmental disclosure to strengthen corporate credibility among their stakeholders. The resource dependence theory is adopted in this thesis and discussed in Section 3.2.4.

#### **3.2.4. Resource Dependence Theory**

For the purpose of this thesis, the corporate environmental disclosure is explained using resource dependence theory which is originally developed by Pfeffer and Salancik (1978). It has since been used as the basis to study and explain the influences of environments on organisational relations (Drees and Heugens 2013). An organisation's survivability in a society is through maintaining its legitimacy or the license to operate within a society. The resource dependence theory posits that an organisation does not operate alone within a community. The theory places organisations in an open system where it is dependent on other constituents within the external environment in order to operate smoothly (Hillman, Cannella and Paetzold 2000; Pfeffer and Salancik 1978).

The basic assumption of resource dependence theory is that an organisation, or more precisely a board of directors, tries to ensure the organisational survival. According to the theory, the key for organisational survival is the organisational ability to acquire and maintain resources (Pfeffer and Salancik 1978). The boards adopt their human and social capital to carry out their duties of monitoring and the provision of resources to the company. The expectations of the company on the individuals appointed to a board in terms of supports and problem solving are emphasised in this theory. Pfeffer and Salancik (1978) identify four benefits that can be provided by the board in terms of: (i) advice and counsel; (ii) legitimacy; (iii) channels for communicating information between external organisations and the company; and (iv) preferential access to commitments or support from important elements outside the company.

The company draws upon the board for crucial resources mainly expertise and guidance in strategic change (Goodstein, Gautam and Boeker 1994). Business Roundtable (2012)

suggests that the board is expected to play a role in shaping the composition and leadership of the board by contributing their experience, knowledge and judgement in order to advise the management on the major issues faced, review and approve major actions of the companies in order to ensure the succession planning for the board. In the premise, board of directors' capital can provide resources to dictate corporate strategic action towards meeting the appropriate interests of shareholders and stakeholders. Ibrahim and Hanefah (2016) sum up the resources provision role of the board of directors in order to meet the demands of the society, which will ensure the legitimacy of a company.

### **3.3. Resource Dependence Theory and Corporate Environmental Disclosure**

In meeting the society's expectation, a company has to draw crucial resources in order to ensure the survival of the company. Hillman, Cannella, and Paetzold (2000) state that board diversity increases the resources contributed by the members of the board in terms of skills, information, legitimacy and access to key constituents (e.g. suppliers, buyers, public policy decision-makers and social groups). A variety in the composition of board of directors such as the gender, age and nationality would generate unique information to the management for decision making (Ayuso and Argandoña 2009).

In the context of disclosure, extant literature cites resource dependence theory to explain managerial choice of corporate environmental disclosure decision-making (Boyd 1990; Hillman and Dalziel 2003; Pfeffer and Salancik 1978). Resource dependence theory suggests that the board facilitates access to resources, which can pose a challenge for companies (Hillman, Withers and Collins 2009; Pfeffer 1972; Pfeffer and Salancik 1978). Under this view, directors are actively engaged in, and influence strategy and programs (Hillman and Dalziel 2003). For instance, a suitable expert is appointed as a director on board in accordance to the need of the company for environmental advice, information or business contacts in order to enhance the company's environmental disclosure. The resource-rich director tends to better advice and counsel management, provide environmental resources that improve corporate environmental performance (Daily and Dalton 2003; Villiers and Staden 2011; Pfeffer and Salancik 1978).

The resource dependence theory explains the impact of board diversity characteristics on the level of environmental disclosures. A mix of expertise, experience and knowledge of a corporate board of directors has the power to influence the management of information disclosure in the annual report or CSR report of the company. The ability of the board of directors to contribute resources to the company by connecting the company with its external environment is crucial as supported by this theory (Hillman and Dalziel 2003). Prior studies provide evidence that board diversity contributes new ideas and perspectives to the company and enhances creativity and innovation (Carter et al. 2007; Miller and Triana 2009; Thomsen et al. 2009; Walt and Ingley 2003). Besides, Frynas and Yamahaki (2016), Reguera-Alvarado, Fuentes, and Laffarga (2017) and Bear, Rahman, and Post (2010) document that a diverse board of directors tends to enhance the effectiveness of the board in managing the business environment and promote positive ratings for environmental disclosures.

The prior studies discussed in the preceding paragraphs are largely consistent with the argument that companies with diverse boards of directors can enhance accountability via information disclosure as a way to strengthen corporate credibility among their stakeholders. Hence, resource dependence theory is used in this thesis to explain the managerial decision-making in corporate environmental disclosure.

### **3.4. Research Proposition**

Corporate environmental practices by Malaysian companies in the past three decades are mostly not disclosed in annual reports (Teoh and Thong 1984). Subsequent prior studies note that the level of corporate environmental reporting in developing countries is still relatively low compared to developed countries (Belal and Momin 2009; Dhaliwal et al. 2011). Xiao et al. (2005) and Belal and Momin (2009) dictate that the CSR practices of developed economy (United Kingdom) is higher than that of emerging economy (Hong Kong). Similarly, Smith, Yahya, and Amiruddin (2007) expound that the corporate environmental reporting by Malaysia companies is low.

Over time, the companies in Malaysia are gradually responding to the global expectation of the society. The KPMG Survey of Corporate Responsibility Reporting 2017 identifies

approximately 97.00 per cent of the Top 100 companies by revenue in Malaysia (N100) disclosed their corporate sustainability performance, compared to global average of 72.00 per cent (Blasco 2017). More companies recognise sustainability reporting acts as a catalyst to gain competitive business advantage for the companies to strengthen their credibility among their stakeholders.

In terms of the type of environmental information communicated, Prathaban and Norasyida Abdul (2005) notice that Malaysian companies disclosed donation drives to various charitable organisations, and an approximate of RM82.1 million had been donated during the periods from July 2003 to December 2004. Their findings concur that Malaysian companies have a mind-set that environmental performance is about corporate philanthropy. Even though the Malaysian government has implemented various environmental initiatives, the level of environmental information communicated has been confined to philanthropy-related activities, and at the discretion of individual company.

According to MCCG 2012, board of directors has the fiduciary duties to ensure the company's strategies in promoting sustainability. MCCG 2012 emphasises the role of the board, among others, in ensuring the disclosure of the company policies related to ESG aspects of business and their implementation in the annual report and the corporate website. Subsequently, the introduction of F4GBM or also known as ESG index further highlights the importance of environmental reporting as the performance of companies that demonstrate ESG practices are evaluated. The issuance of Sustainability Reporting Guide and Toolkit pursuant to the new Sustainability Framework introduced by Bursa Malaysia in 2015 provides further guidance to public listed companies to disclose a narrative statement of economic, environmental and social risk and opportunities in their annual reports. The continuous efforts directed at the sustainability and governance structure are expected to enhance transparency, disclosure and accountability of public listed companies. To meet the needs of increasingly sophisticated stakeholders, it is not unreasonable to presume Malaysian companies are likely to disclose more

environmental information. Hence, this thesis analyses the following overarching research proposition:

*There is a significant increase in the level of environmental disclosure by Malaysian listed companies from 2014 to 2016.*

### **3.5. Board Diversity and Corporate Environmental Disclosures**

In recent years, diversity in the corporate board has been a global issue around the world. It has been a very dynamic area of corporate governance. Several developed countries now require companies to improve their board diversity. Board diversity is a variation of combined attributes, expertise and characteristics provided by each individuals of the board in terms of board process and decision-making (Walt and Ingley 2003). Erhardt, Werbel, and Shrader (2003) and Milliken and Martins (1996) categorise diversity into observable or demographic diversity and non-observable or cognitive diversity. Observable or demographic diversity encompasses gender, age, nationality and race background whereas; non-observable or cognitive diversity comprises educational background, professional experience and membership of organisations.

Taking diversity into account, the recruitment of boards can be supported by resource dependence theory. Hillman, Cannella, and Paetzold (2000) expound that diversity of management contributes divergent resources that bring benefits to the company. A heterogeneous group of directors allows effective decision making by reducing the risk of ‘groupthink’ and have a better understanding of the stakeholders’ demands (ACCA 2018). Diversified board of directors possess different characteristics, skills, backgrounds and experiences, which lead to dissimilar leadership, thinking, emotional styles and even risk preferences and behaviours. This fosters creativity in problem solving and encourages a more comprehensive oversight to the business operation as the company is more sensible towards the possible risks for instance, reputation and compliance risks. With a diverse connection with the external environment, this heterogeneous group of decision makers have a better understanding of the stakeholders’ claims and are more supportive towards environmental reporting.



Under the resource dependence theory, board serves to link the company with its environment which includes various external constituencies in order to address environmental dependencies. This theory expands the centrality of the role of board's independence because it highlights the ability of directors to develop external links and resources to gather important information for the company (Siciliano 1996). In this context, diversity outstretches the directors' profiles to improve relations with stakeholders; increases level of sensitivity in regards to the concern of society and acquire knowledge about the possibilities of benefits derived from environmental reporting. The foregoing discussion unanimously agree that a heterogeneous group of decision makers in the board can enhance company competitiveness and effective decision-making including the type and extent of corporate information disclosures.

The following sub-sections discuss literature in formulating hypotheses relating board diversity to environmental disclosure in Malaysia.

### **3.5.1. Nationality**

The inclusion of foreign directors on board can bring various potential advantages to the companies. Foreign directors are equipped with international experience and have a deeper understanding on the global business trends and behaviour that vary in different markets. According to Ruigrok, Peck, and Tacheva (2007), foreign directors contribute valuable and different opinion and expertise due to their diverse language, religion, experiences, norms and culture of the country which leads to the improvement of decision making of the board.

Muttakin, Khan, and Subramaniam (2015) expound that foreign directors on board encourage a higher commitment to corporate monitoring and transparency as well as enhancing the company's image in the society. In building the company's reputation, the foreign directors are more likely to encourage corporate social responsibility reporting.

As foreign directors are equipped with international exposure and knowledge on global issues, they have a global mind-set that aligns the company's goal, while being sensitive to the needs of the cultures in which they operate in. Sustainable development practices

have been the consideration of the global business partners when making investment decision. In ensuring consistent flow of FDIs, the foreign directors are more aware of the need for transparent accountability by disclosing their environmental information in the annual reports.

Nationality diversity has been empirically researched in regard to environmental disclosure. Muttakin, Khan, and Subramaniam (2015) dictate that the relationship between company size characteristics, board diversity and the level of CSR disclosures in Bangladesh. The study documents that foreign directorship has positive impact on CSR disclosure due to their international exposure and knowledge. Similarly, Ibrahim and Hanefah (2016) find that there is a statistically significant and positive association between the proportion of foreign nationals on the board and the level of CSR disclosure. The study suggests that foreign directors as outside directors provide more input and diverse opinions to the company. On the other hand, Sharif and Rashid (2014) find that the percentage of foreign nationals on the board has no effect on the CSR reporting information by the banks. The study indicates that Pakistani commercial bank uses annual reports merely as a prospect to put across their image and legitimize their activities.

Notwithstanding the mixed results of past studies, resource dependence theory suggests that the diversity of nationality on board serves as a source of organisational diverse experience, expertise and culture which can lead to the provision of better advice and better access to resources (Pfeffer and Salancik 1978). The diverse national background of foreign directors provides a better link with stakeholders which could be of beneficial in creating commercial opportunities for the company. It is expected that nationality diversity can improve the communication of environmental information to enhance the public image as well as legitimacy of the company to wide array of stakeholders. Hence, to test the association between nationality and environmental disclosure, the following hypothesis is established:

*Hypothesis 1: There is a positive association between the proportion of foreign directors on the board and the level of environmental disclosure by Malaysian listed companies.*

### **3.5.2. Age**

Age diversity within the board of directors is expressed as the co-existence of different generations, and therefore possessing different values, motivational goals, habits, and experiences that influence the intuitive decision making approach practiced by the directors. Rhodes (1983) in his research on organisational psychology demonstrates a significant association between age and a variety of work-related attitudes. In the context of corporate governance, age affects the behaviour and likelihood of the directors to accept new ideas about board functioning (Zajac and Westphal 1996).

Senior directors are more experienced, and symbolize a form of accumulation of skill-based competencies; whilst younger directors are more dynamic, open to technological change and active in running the business success and future planning (Handajani et al. 2014). Bekiroğlu, Erdil, and Alpkın (2011) expound that the younger directors are more sensible towards the environmental and ethical issues as a matter of logic and principle that leads to socially responsible and environmentally friendly behaviour. According to Diamantopoulos et al. (2003), age is associated with environmental attitudes and knowledge of environmental issues.

There are two main reasons for the relatively higher environmental attitudes of youngsters. First, youngsters have received better science education than the elders. The climate change as a subset of environmental issues is relatively new and becomes a major issue in the 1960s. For instance the Malaysian government is integrating Education for Sustainable Development (ESD) as proposed by the United Nations to the biology curriculum for the secondary school education (Esa 2010).

Secondly, youngsters support the environmental reporting as they perceive a higher vulnerability to its consequences. The youngsters are disproportionately more exposed to the effects of climate change as compared to the other age groups. Ciocirlan and Pettersson (2012) state that youngsters are more prone to be negatively affected by natural disasters, water-borne infectious diseases, and childhood respiratory illnesses than other age groups. When the youngsters translate their higher environmental attitudes into

behaviour and actions in the workplace, they tend to bring new perspectives and ideas to the companies.

For the past few years, age diversity has been empirically investigated in regard to environmental disclosure. Ferrero-Ferrero, Fernández-Izquierdo, and Muñoz-Torres (2015) expound that there is a statistically significant and positive association between generational diversity and CSR performance. Similarly, Ibrahim and Hanefah (2016) dictate that there is a statistically significant positive association between the young board members and CSR disclosure. On the other hand, Giannarakis (2014) find that the board average age has no effect on the level of CSR disclosure, contrary to the beliefs that younger directors can introduce more innovative management techniques.

Notwithstanding the mixed results of prior literature, resource dependence theory suggests that younger directors are resource rich, denoted by being a source of organisational knowledge that lead to the provision of better advice and better access to resources (Pfeffer and Salancik 1978). Taken together the empirical studies and theoretical premise, younger directors on board are expected to encourage strategic amendment in meeting the stakeholders' concerns on the environmental issues and report their environmental practices in the annual reports. To formally test the influence of education on the level of environmental disclosure, the following hypothesis is formulated:

*Hypothesis 2: There is a positive association between the proportion of younger directors and the level of environmental disclosure by Malaysian listed companies.*

### **3.5.3. Education**

The society is demanding companies to acknowledge and address ethical dilemmas and issues of social responsibility, in the form of effective moral judgment, expressed through justifiable decision. The education of directors on board reflects the attitudes and actions in regard to ethics and social responsibility. Appropriate educational backgrounds and trainings nurture the directors with skills and knowledge in dealing with the social, ethical and environmental impacts of business activities (Sánchez, Bolívar and Hernández 2017).

Directors with educated background in business degree or law degree are innovative and more likely to consider and adopt various approaches to complex problem solving and decision making. Damanpour and Schneider (2006) state the directors with educated background have a greater capacity for information acquisition and are capable of reducing uncertainty in facing situations as well as more receptive to new ideas and favourable solutions.

Lewis, Walls, and Dowell (2014) document that directors with higher educational qualification would influence company values. They note that the directors with MBAs are likely to be skilled and experienced in decision-making and acquired the knowledge to identify and benefit from opportunities that enhance the company's value. This encourages the directors to perceive requests to disclose their companies' environmental performance as a strategic opportunity.

In addition, individuals with legal background are perceived to be suitable candidates for directorship because of the support specialist role they can fulfil as a result of their legal expertise (Hillman, Cannella and Paetzold 2000). This is because they are held to a higher professional standard, acquire better understanding of the legal environment, and are more adept at managing with politically sensitive areas such as environmental performances (Harris and Valihura 1997).

As directors with legal background are cognizant of the public effects of corporate behaviour and the far-reaching consequences of non-compliance with sound environmental practices, they are capable of providing environmental law expertise to the companies (McKendall, Sánchez and Sicilian 1999). This view is agreed by Said, Omar, and Abdullah (2013) who express that the existence of directors with legal degrees are more aware of the regulations and laws governing foundations of environmental reporting. The directors with legal degrees are aware of the potential risks and more receptive to the institutional demand in regard to environmental disclosure.

This is consistent with the study done by Agrawal and Knoeber (2001) whereby a prevalent number of directors with legal backgrounds are found in companies where the cost of environmental regulation is higher. Kassinis and Vafeas (2002) also note that companies tend to include directors with legal qualification in the boards due to their legal expert advice as an additional resource for promoting sound environmental policy. The directors with legal backgrounds acquire the analytical skills to discover environmental opportunities and are adept at the stakeholder impacts of environmental actions. Their professional status enables the discussion of environmental opportunities among the intellectual circles and higher social networks.

For the past few years, education diversity has been empirically investigated in regard to environmental disclosure. Said, Omar, and Abdullah (2013) report a statistically significant and positive association between the Chief Executive Officer (CEO) with finance and law background and the level of environmental disclosure. Similarly, Lewis, Walls, and Dowell (2014) reveal that CEOs with Master of Business Administration (MBA) degree are more likely to disclose environmental information of the companies. On the other hand, Sánchez, Bolívar, and Hernández (2017) find no association between the educated directors with the level of environmental disclosure.

Notwithstanding the mixed results of prior literature, resource dependence theory suggests that directors, who are resource rich, denoted by being experts in their fields, are in a position to provide better advice, information, and resource access to the companies (Hillman and Dalziel 2003; Pfeffer and Salancik 1978). Taken together the empirical studies and the theoretical premise, directors with business or legal educational background are expected to be more likely to adopt environmental practices and thus report them in annual reports. To formally test the influence of education on the level of environmental disclosure, the following hypothesis is proposed:

*Hypothesis 3: There is a positive association between the proportion of educated directors and the level of environmental disclosure by Malaysian listed companies.*

#### **3.5.4. Gender**

Companies' values tend to get elevated with the presence of female directors on board (Brennan and McCafferty 1997; Fondas 2000). Previous studies also document that the presence of women directors on the board tends to encourage more charity (Coffey and Wang 1998; Wang and Coffey 1992; Williams 2003). This is because women are more sensible socially (Burgess and Tharenou 2002), and eventually leads to higher opportunities for the companies to meet the stakeholders expectations in environmental activities (Shehata 2013). Nevertheless, female directors contribute different perspectives, culture and methods of working to the companies (Daily and Dalton 2003), thus enhancing a diversity of opinions in the board and improving decision making of the board (Carter, Simkins and Simpson 2003; Shehata 2013).

The role of female directors in the board is emphasised in Corporate Governance Blueprint 2011 of Securities Commission Malaysia where the Blueprint requires the participation of female directors in bringing different viewpoints to the board and has a bigger perspective on social and environmental performances that concerns the stakeholders (Jizi 2017). The Blueprint requires a mandatory of at least 30 per cent of corporate board to be given to women by year 2016. This shows that Malaysia government has been working in initiating the involvement of female in decision-making position.

Over the past few years, gender diversity has been empirically studied in regard to environmental disclosure. Prior studies conducted by Bear, Rahman, and Post (2010), Ben-Amar, Chang, and McIlkenny (2017), and Jizi (2017) show a significant positive association between the proportion of female directors on board and the level of environmental disclosure. Bear, Rahman, and Post (2010) state that the number of females directors on board has a positive association with the strength ratings for CSR. The CSR rating of the company increases with an increase in the number of female directors on board. Ben-Amar, Chang, and McIlkenny (2017) report that female boardroom participation has a positive association with the voluntary disclosure of climate change information. The result reflects that gender diversity enhances board

effectiveness in stakeholder management and practicing sustainability in their business operation. Similarly, Jizi (2017) discovers female participation on board favourably affects the CSR engagement and reporting as well as the establishment of ethical policies. This shows that female directors facilitate the direction of the company's resources toward value maximizing social projects, and subsequent reporting on the environmental practices.

The aforementioned literature documents that women tend to acknowledge more on the social and environmental issues which makes them more motivated than men in managing the environmental risks. According to Pfeffer and Salancik (1978), resource dependence theory asserts that a company's external environment affects its performance where diverse boards are necessary to fulfil the board's many functions. The integration of the differing skills and knowledge of male and female directors are crucial for decision making. In line with the empirical studies and the theoretical foundation, female directors in the corporate board positively affect the decision making that leads to a more sustainable company strategy and environmental disclosure. Hence, it can be hypothesized that:

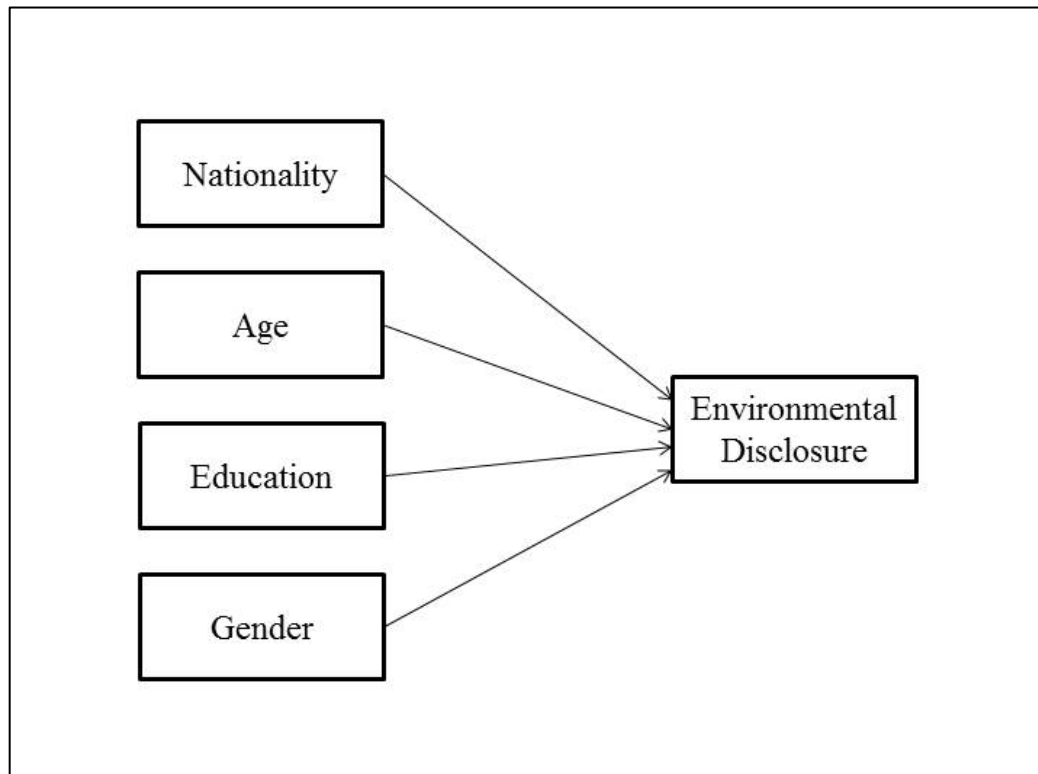
*Hypothesis 4: There is a positive association between the proportion of female directors and the level of environmental disclosure by Malaysian listed companies.*

### **3.6. Conceptual Schema**

The conceptual schema underlying the hypotheses is shown in Figure 3.1. The hypotheses developed are for examining the significance of association between age, gender, nationality and education of corporate board diversity and the level of environmental disclosure practices of Malaysian public listed companies from years 2014 to 2016.



**Figure 3.1 Conceptual Schema**



### **3.7. Summary**

This chapter illustrates the resource dependence theory as the theoretical framework adopted for this thesis and reviews prior literature. The resource dependence theory indicates that the companies are dependent on their surroundings to ensure the flow of critical resources for their survival. In the corporate context, the theory highlights the role of board of directors in ensuring the flow of critical resources to the company. Based on prior literature, board diversity tends to have positive impact on the level of environmental disclosure. In the main, a heterogeneous group of decision makers in the board encourages company competitiveness and supports effective decision making including decisions to be more environmentally responsible. The next chapter presents the research methodology adopted in this thesis.

## **CHAPTER 4. RESEARCH METHODOLOGY**

### **4.1. Introduction**

This chapter provides the research methodology employed by this thesis. This thesis is explained based on positivist empirical research method on the level of Environmental Disclosure Index in Malaysian public listed companies and the factors that affect the level of environmental disclosure. The design of the Environmental Disclosure Index used in this thesis as a method of measurement of the level of environmental disclosures is explained in Section 4.2. Section 4.3 describes the measurement of independent variables used in this thesis. The measurement of control variables is explained in Section 4.4. Section 4.5 describes the data analysis carried out in this thesis. Finally, Section 4.6 provides a summary of this chapter.

### **4.2. Development of Environmental Disclosure Index (EDI)**

The public listed companies in Malaysia have the choice of environmental information disclosed in annual reports or stand-alone sustainability reports despite the introduction of Sustainability Reporting Guideline and Toolkit in 2015. Hence, the type and amount of environmental disclosure in the annual reports of Malaysian public listed companies remains voluntary. Past studies adopt a mechanism to capture the level of disclosure using a disclosure index.

Disclosure index can be derived by way of either the adoption of the disclosure instrument developed by other researchers (Burgwal and Vieira 2014; Ahmad and Haraf 2013; Patten 2002) or self-constructed index (Clarkson et al. 2008; Wiseman 1982; Jose and Lee 2007). The disclosure index adopted from prior studies is more objective since it has been tested although it may suffer from construct validity. On the other hand, the self-constructed index may have higher construct validity but the objectivity concern is unverified.

Previous studies evaluate the level of environmental disclosures based on the content analysis index by Wiseman (1982). The Wiseman index focuses on quantitative disclosure where the index assesses the financial consequences of corporate

environmental activities. This method allows the companies with poor environmental performances to have better disclosure scores than companies with good environmental performances. This is because companies with poor environmental performances tend to have greater environmental exposures and are obligated to disclose any material financial information in their annual reports in order to improve their public impressions on their actual environmental performance.

In contrast to the index by Wiseman (1982) that focuses on the disclosures about the financial consequences of environmental activities, EDI by Clarkson et al. (2008) places more weight on the disclosures that reveal the true but unobservable environmental performance of the companies. The reliability of the inferences on the actual level of environmental disclosure in the context of Malaysia is enhanced by focusing exclusively on the environmental disclosures with an EDI that reveals the 'type' of environmental performances.

The EDI by Clarkson et al. (2008) focuses on the disclosures of the company related to its commitment to safeguard the environment. It allows the users to infer the companies environmental performance types from the disclosure as the EDI is categorised into 'soft' and 'hard' disclosure items which reflect the companies' commitment and related environmental exposures. The empirical results from Clarkson et al. (2008) support the assertion that companies with good environmental performance signal their environmental performance type through 'hard' disclosures that are not easily mimicked by companies with poor environmental performances. Based on the type of environmental disclosure revealed, the users are able to infer the companies with good environmental performances have lower future environmental liabilities compared to companies with poor environmental performances (Clarkson et al. 2008).

For the purpose of this thesis, the EDI developed by Clarkson et al. (2008) is used to evaluate the level of environmental disclosure in Malaysian public listed companies. The EDI adopted from Clarkson et al. (2008) is transparent because the data sources and scoring criteria are made fully explicit. Clarkson et al. (2008) engage an expert in the

field of environmental reporting in the development of the environmental disclosure instrument to ensure its content validity (Rahman and Post 2012).

The EDI by Clarkson et al. (2008) entails a scorecard which is based on sustainability reporting guideline issued in 2002<sup>3</sup> by the Global Reporting Initiative (GRI), making it universally applicable and suitable for developing country context, for instance, Malaysia. The GRI framework is a voluntary reporting tool that uses the term sustainability to describe disclosures on the ESG aspects of sustainable development. The widespread adoption of GRI is derived from the potential benefits of this framework as it provides the opportunities to benchmark, compare, and communicate social and environmental efforts within and across the sectors (Fonseca 2010). The benefits are hardly argued, but what remains debatable is whether the benefits outweigh the weaknesses of the framework and unintended risks for the environment and society.

The most disputable aspect of GRI is the focus of the framework on the internal organisational performance (Fonseca 2010). The framework emphasises the disclosure on the 'internal' performance of the companies and disregards the interactive effects of organisations with external environment. Milne and Gray (2013) expound that sustainability reporting requires a detailed and complex analysis of the interactions of companies with ecological systems, resources, habitats and societies. Besides, the GRI framework is lacking of integrated indicators which is fundamental in sustainability decision making (Davidson 2004). The framework does not encourage the companies to weigh and understand the indicators' relative values or combine them in to numerical indexes, indices and visual diagrams. Another concern of GRI framework is the mechanism to guide and encourage external verification or assurance. The assertion of cherry picking in voluntary sustainability reporting causes a gap in the credibility in the disclosure (Henriques 2013; MacLean and Rebernak 2007).

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<sup>3</sup>The new GRI Standards is introduced in 2016, replacing the previous guidelines. However, the new GRI Standards incorporate the same key concepts and disclosures from the previous guidelines but with a new structure and format (GRI 2018a). The 2002 Sustainability Reporting Guidelines recognises the value of both qualitative and quantitative information to ensure a balanced view on organisation's ESG performance, which is highly relevant to the objective of the EDI by Clarkson et al. (2008) in identifying the type of disclosure (Global Reporting Initiative 2002). Thus, 2002 Sustainability Reporting Guidelines is kept as the most appropriate guideline to construct the EDI by Clarkson et al. (2008).

In regard to the problems discussed in the above paragraph, the GRI framework attempts to overcome the limitations of the ‘internal organisational’ by introducing the Sustainability Context principle. This principle encourages the companies to analyse their interactions with society and the environment. The companies are advised to report their environmental performance by presenting the magnitude of impact and their contribution in appropriate geographical contexts in accordance to a broader and recognised sustainable development conditions and goals (GRI 2006).

The GRI framework is susceptible to different views on its strengths and weaknesses due to its complexity and breadth. However, the EDI by Clarkson et al. (2008) follows the GRI guidelines because GRI is accepted as the most robust and comprehensive framework of non-financial disclosures (Abeysekera 2013; Purcell 2007). The GRI highlights a set of underlying principles and qualitative characteristics in reporting for instance, transparency, inclusiveness, quality, reliability and timeliness. The overarching principles of GRI ensure a balanced and reasonable account of ESG performance, facilitate comparison over time and across organisations, and credibly address issues of concern to stakeholders (Global Reporting Initiative 2002). Hence, the EDI by Clarkson et al. (2008) serves as a credible and accountable tool of measurement in examining the scope, depth and length of the level of environmental disclosure.

#### **4.2.1. Corporate Environmental Disclosure Items**

The EDI index comprises 45 disclosure items. Clarkson et al. (2008) segregates the EDI into 29 ‘hard’ and 16 ‘soft’ disclosure measures to assess the quality of discretionary disclosures about environmental policies, performance and inputs. Adams (2004, 732) dictates that it is important to differentiate ‘hard’ and ‘soft’ items to assess accountability by suggesting that “a good ‘ethical’ report should be transparent and represent a genuine attempt to provide an account which covers negative as well as positive aspects of all material impacts. To be accountable, reports need to demonstrate corporate acceptance of its ethical, social and environmental responsibility.”

Clarkson et al. (2008) reveal that the ‘hard’ corporate environmental disclosure reflects the score attained with the objective and verifiable performance indicators of the GRI based disclosure index. The ‘hard’ disclosure items are objective and are divided into four categories namely,

A1. Governance structure and management system

A2. Credibility

A3. Environmental performance indicators

A4. Environmental spending

Category A1 highlights the disclosure related to company’s governance structure and management systems with respect to environmental protection. For example, companies with environmental committee or have implemented ISO 14001 tend to inform the stakeholders of such commitments. A2 focuses on the credibility of a company’s disclosures in its environmental report. This category scores the companies that issue environmental reports with independent verification including the environmental programs certified by independent agencies and third parties. The environmental performance indicators on actual pollution emissions and the conservation and recycling efforts are included in A3. The company’s environmental spending such as dollar savings arising from existing environmental programs and efforts to enhance future environmental performance, the investment in new environmental technologies or environmentally related Research and Development (R&D) and innovation are reflected in A4.

Furthermore, Clarkson et al. (2008) classify certain corporate environmental disclosure items as “soft” to represent the performance indicators that cannot be easily verified by GRI-based disclosure index. The ‘soft’ disclosure measures are subjective as they are unverifiable claims committed to the environment and conveniently impersonated. There are three categories of ‘soft’ disclosure measures, which include:

A5. Vision and strategy claims

A6. Environmental profile

A7. Environmental initiatives

A5 reflects the company's vision and environmental strategy claims. For example, companies often disclose broadly that they practice environmental policy and the commitment of the management in protecting the environment. Such claims can be genuine when putting it in the specific context but the statement can also be deceiving and easily mimicked as they lack of credibility and substantiation. A6 refers to the disclosure of a company's environmental profile given the existing and future environmental regulation. A7 assesses the environmental initiatives undertaken by a company such as employee training in environmental management, existence of response plans for environmental accidents, internal environmental awards and audit, as well as the involvement in community through scholarship and donations. These initiatives can show true commitment but can also be easily imitated by companies with no real commitments in protecting the environment.

Hence, the EDI consists of seven broad categories of environmental disclosures with a total of 45 items to gauge the level of environmental disclosure of Malaysian listed companies. The EDI instrument is attached in Appendix A.

#### **4.2.2. Selection of Sample Companies**

The thesis covers a 3-year period from 2014 to 2016. The selection of these years is due to the revised Malaysian Code on Corporate Governance in 2012 (MCCG 2012) which focuses on the board and its committees to carry out their roles effectively and promote timely and balanced disclosure by ensuring the companies have appropriate corporate disclosure policies and procedures. MCCG 2012 also recommends that the board should ensure the company's strategies to promote sustainability by focusing on the environmental, social and governance (ESG) aspects of business. It is of vital importance to make a balance between ESG aspects and the stakeholders' interests in order to improve investor perception and gain trust from the public. The companies should disclose these policies and their implementations in their annual report and the corporate websites.

The 3-year period is chosen in view of the introduction of FTSE4Good Bursa Malaysia Index in 2014 where the performance of companies that demonstrates strong ESG practices is evaluated. In addition, a new Sustainability Framework is introduced by Bursa Malaysia in 2015 requiring the disclosure of the statement of sustainability that covers material sustainability matters based on the GRI Guidelines. In line with the new Sustainability Framework, the companies are encouraged to disclose relevant sustainability information in their annual reports to build good reputation for the company as the FTSE4Good Bursa Malaysia Index consists of the constituents of Malaysian companies with leading corporate responsibility practices.

It is appropriate to study the companies' disclosure practices following the introduction of MCG 2012, FTSE4Good Bursa Malaysia Index in 2014 and the new Sustainability Framework in 2015, Year 2016 is included as it represents the latest year for which annual reports are available for data collection. The time frame chosen is reasonable to allow sufficient time for the companies to respond to these initiatives.

This thesis focuses on public listed companies on the Main Board of Bursa Malaysia. The sampling frame covers population of listed companies in five industrial sectors namely (i) Plantations; (ii) Consumer Products; (iii) Construction; (iv) Industrial Products; and (v) Trading and Services. The selected industries are perceived to be more environmentally sensitive by the Department of Environment (DOE) of Malaysia. Ahmad, Hassan, and Mohammad (2003) state that environmental sensitive companies tend to exhibit higher environmental information than companies from the banking industry. Furthermore, prior studies conducted by Raar (2002) and Buniamin (2010) affirm that environmentally sensitive companies have a higher disclosure of environmental information than the less environmental sensitive companies. Environmentally sensitive companies have a bigger impact on the ecosystem and the community. Consequently, the stakeholders exert a higher pressure in these sectors to disclose their environmental performances (Deegan, Rankin and Tobin 2002).



Using 2014 as the base year, there is a total of 764 companies in the environmentally sensitive sectors listed on the stock exchange. The number of companies in each industry sector is tabulated in Table 4.1. The sectors that have the largest number of companies are Industrial Product, and Trading and Services, followed by Consumer Product sector. Construction and Plantation sectors have lesser number of companies. In order for a company to be selected for the thesis, the sample company must satisfy two criteria: (i) the company selected in 2014 must remain listed in Bursa Malaysia stock exchange in the latter two periods; and (ii) the annual reports must be available for the entire time frame (2014-2016). Sample companies are drawn from the five industry sectors by using proportionate stratified random sampling to ensure same sampling fraction for each sector. The sample companies of each sector are proportionate to the population size of the sector when viewed against the total population.

Using this sampling approach, a final sample size of 150 companies is drawn, which represents 20% of the available population from the five industry sectors. Gorsuch (1983) and Arrindell and van der Ende (1985) suggest a sample size of at least 100 companies is adequate for statistical testing. Furthermore, the sample size of 150 companies is considered reasonable by reference to the sample sizes used in prior studies, for example, 117 companies in Ibrahim and Hanefah (2016), 100 companies in Ramasamy, Ling, and Ting (2007), 139 companies in Haniffa and Cooke (2005) and 176 companies in Rouf and Abdur (2011). Table 4.1 shows the number of sample companies in each of the industry sectors. A list of sample companies is included in Appendix B.

**Table 4.1 Derivation of Final Sample**

<b>Industrial Sectors</b>	<b>Number of Listed Companies</b>	<b>Number of Sample Listed Companies</b>	<b>Percentage of Sample Companies from Population (%)</b>
<b>Plantations</b>	42	8	19.048
<b>Consumer Products</b>	161	32	19.876
<b>Construction</b>	69	14	20.29
<b>Industrial Products</b>	267	52	19.476
<b>Trading And Services</b>	225	44	19.556
<b>Total</b>	764	150	19.634

The samples used for testing the hypotheses over the 3-year period make up a total of 450 company-year observations. There should be a sufficient panel data set in allowing a comprehensive analysis and generating substantial inferences from the results.

#### **4.2.3. Annual Report and Stand-alone Sustainability Report as the Source of Information**

Annual reports or stand-alone sustainability reports<sup>4</sup> are used as the main sources for environmental disclosure measurement and data collection. Data consists of public and private information, financial and non-financial information, and quantitative and non-quantitative information in regards to the company's management of environmental issues. This information is provided in the annual report or in separate environmental report issued which is often referred to as stand-alone sustainability report (Burgwal and Vieira 2014). World Business Council for Sustainable Development (2002) defines sustainability report as a public reports by companies to provide internal and external stakeholders with a picture of corporate position and activities on economic, environmental and social dimensions. The stand-alone sustainability report delineates the company's contribution toward sustainable development.

The annual report or stand-alone sustainability report is the main communication tool between the company and stakeholders who use it to facilitate decision making (Burritt and Schaltegger 2010; Villiers and Staden 2011; Iatridis 2013).

In the context of Malaysia, public listed companies can choose to disclose CSR information within annual reports or stand-alone sustainability reports as an extension of annual reports. According to Adams, Hill, and Roberts (1998), both stand-alone sustainability reports and annual reports are published audited documents which, arguably, are credible and authoritative. Even though there are other disclosure avenues

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<sup>4</sup> Malaysian public listed companies can choose to disclose CSR information either in annual reports or in stand-alone sustainability reports. When stand-alone report is opted, the CSR information will not be provided in the annual report. Alternatively, companies can choose to disclose CSR information in annual reports alone in which case, stand-alone sustainability reports will not be produced.

useful as corporate communication media, these two reports are easily accessible and available. Hence, this thesis uses annual report or stand-alone sustainability report as good proxy for the level of environmental disclosure provided by a company.

#### **4.2.4. Scoring and Weighting of EDI Items**

In prior literature, corporate environmental disclosure measurement techniques are categorised into two groups, namely counting and classifying (Milne and Adler 1999). The counting measurement technique gauges the level of environmental disclosure by ways of the number of pages, sentences, words, types of disclosure items (Deegan and Gordon 1996). This type of measurement is criticised as it cannot take into account the use of non-textual information (McMurtrie 2005) as well as the potential error in codification especially when counting does not significantly differ (Deegan and Gordon 1996; Steenkamp and Northcott 2007).

On the other hand, the classifying technique using content analysis is a method of codifying the text of a piece of writing into various groups or categories according to specific criteria or theme. In order to allow further analysis, quantitative scales are derived after codifying the text. (Michelon and Parbonetti 2012; Gamerschlag, Möller and Verbeeten 2011). This method assumes that frequency is an indication of the subject matter's importance. The aim of this technique lies in producing a numerically based summary of a chosen message set (Gamerschlag, Möller and Verbeeten 2011). This content analysis technique allows environmental disclosure to be systematically classified and compared, and is useful for determining the disclosure trends (Milne and Adler 1999). Content analysis is a line of research widely adopted in corporate social responsibility disclosure literature (Michelon and Parbonetti 2012; Al-Tuwaijri, Christensen and Hughes II 2004; Clarkson et al. 2008; Burgwal and Vieira 2014; Patten 2002; Wiseman 1982; Ahmad and Mohamad 2014). Hence, this thesis employs content analysis method by focusing and analysing on the information disclosed using a content analysis index based on the environmental disclosure index of Clarkson et al. (2008).

In ensuring the consistency of the EDI scores, the annual reports of the sample companies are scrutinised twice with a time interval of two weeks in between each

reading. In order to ensure the reliability of the EDI scores, the scoring is managed by a single researcher during the two readings. This method maintains the scoring consistency. This method of scoring has been widely used in prior disclosure studies (Cooke 1992; Muttakin and Khan 2014).

Environmental disclosures are scored against the EDI checklist which comprises 45 disclosure items altogether. This thesis employs unweighted approach<sup>5</sup> to scoring disclosure items. This approach entails a dichotomous procedure where a score of ‘1’ is assigned to every environmental information item disclosed in annual report or stand-alone sustainability report and ‘0’ otherwise (Lunney 1970). Prior studies that employed the unweighted approach in scoring disclosure items are Clarkson et al. (2008), Ahmad and Mohamad (2014), and Burgwal and Vieira (2014). The unweighted scoring approach assumes that all items are similarly important to all users of the annual reports in facilitating their decision-making (Fagin and Wimmers 2000). The unweighted scoring approach is preferred over the weighted approach in this study due to the equal weighting being assigned to disclosure items to avoid subjectivity and biasness. The scores are added to derive a final score for each sample company in each period.

#### **4.3. Measurement of Dependent Variable**

The dependent variable in this thesis is the level of the environmental disclosure. Following the unweighted scoring approach as described in the preceding paragraph, a company’s EDI score is derived as the ratio of actual disclosure score to the maximum possible score. Prior studies that adopted this scoring approach include Burgwal and Vieira (2014) and Ibrahim and Hanefah (2016). The formula to determine the EDI is shown below:

$$EDI = \frac{\text{Number of items disclosed in annual report of a company}}{\text{Total number of items in the disclosure checklist}} \times 100\%$$

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<sup>5</sup> The scoring method in disclosure literature comprises weighted and unweighted. A weighted scoring method scores options or solutions against a prioritize requirements list to determine which option best fits the selection criteria (Zimmer 2011; Fagin and Wimmers 2000).

The above EDI calculation is the primary measure of the dependent variable used in this thesis.

#### **4.4. Measurement of Independent Variables**

The independent variables being selected for this thesis are based on theoretical reasoning, empirical literature, and are relevant in the Malaysian context. The independent variables comprising gender, education, age and nationality are measured for each company. Information on variables is based on the companies' annual reports. The sub-sections below describe the measurement of each variable.

##### **4.4.1. Nationality**

According to Muttakin, Khan, and Subramaniam (2015), foreign directors encourage environmental reporting as they are aware of the need for transparent accountability due to their international exposure and knowledge on the global issue. In this thesis, nationality is measured as the proportion of foreign directors on the board. The proportion of foreign directors is a ratio scale that enables a wide spectrum of both descriptive and inferential statistics to be applied which is useful in statistical analysis. This measurement is used by Ibrahim and Hanefah (2016).

##### **4.4.2. Age**

Bekiroğlu, Erdil, and Alpkan (2011) dictate that the younger directors are more sensible towards the environmental issues as they are more dynamic and open to new ideas. Following Ibrahim and Hanefah (2016), age is measured based on the proportion of directors who are below 40 years old on board. The proportion of younger directors is a ratio scale with absolute zero that is useful studying the descriptive and inferential statistics.

##### **4.4.3. Education**

Lewis, Walls, and Dowell (2014) dictate that the directors with business degree are skilled in making decision that benefits the company's value. Said, Omar, and Abdullah (2013) expound that directors with legal degrees are more receptive to institutional demand in environmental reporting. For the purpose of this thesis, educational level is measured by reference to the proportion of directors possessing business degree and law

degree qualifications. This is a ratio measurement with absolute zero that is useful in descriptive and inferential statistics. This measurement concurs with Haniffa and Cooke (2005), Lewis, Walls, and Dowell (2014), and Said, Omar, and Abdullah (2013).

#### **4.4.4. Gender**

Bear, Rahman, and Post (2010), Ben-Amar, Chang, and McIlkenny (2017) and Jizi (2017) expound that female directors on board favourably affects the environmental engagement and reporting as they are more sensible socially. The gender diversity is measured based on the proportion of female directors on board. This ratio scale denotes the order, exact value and has an absolute zero that allows a wide range of both descriptive and inferential statistics to be applied. Prior studies that use this measurement include Glass, Cook, and Ingersoll (2016), Carrasco et al. (2015) and Gul, Srinidhi, and Ng (2011).

#### **4.5. Measurement of Control Variables**

Control variables that have been found significantly affecting companies' environmental disclosure are included in the statistical analysis in this thesis. Both the company-specific characteristics and corporate governance attributes are included and measured for each company. These control variables and their relevant proxy measures are defined as follows:

##### **4.5.1. Company Size**

Previous studies consistently document that size is an important predictor of corporate reporting behaviour. Large companies tend to disclose greater amount of environmental information to meet the demand from different stakeholders as well as higher level of monitoring from the public (Cheng and Courtenay 2006; Haniffa and Cooke 2005; Said, Zainuddin and Haron 2009).

The size of the company is measured by natural logarithm of total assets, which is consistent with the past studies done by Mehran (1995), Hackston and Milne (1996) and Said, Omar, and Abdullah (2013).

#### **4.5.2. Industry**

The level of environmental disclosure is dependent on the industry the company is operating in as eloquently stated by Monteiro and Aibar-Guzmán (2010), Brammer and Pavelin (2008) and (Clarkson et al. 2008). Cooke (1989) draws attention to the likelihood that leading companies operating in a particular industry could have a bandwagon effect on the level of disclosure adopted by other companies within the same industry. Disclosure level is more likely to differ among different industries, reflecting their unique characteristics. The quality of the environmental information reported is associated with the nature of the industry of the business operation as the companies are influenced by the key stakeholders (Sinclair-Desgagne and Gozlan 2003). According to the industry categorisation in Bursa Malaysia, this thesis draws the sample from Plantations, Consumer Products, Construction, Industrial Products and Trading and Services sectors. The selected industries are consistent with industries that are perceived to be more environmentally sensitive by Department of Environment (DOE) of Malaysia. This is consistent with prior studies conducted by Raar (2002), Buniamin (2010), and Ahmad, Hassan, and Mohammad (2003) that affirm environmentally sensitive companies have a higher disclosure of environmental information than the less environmental sensitive companies.

A dichotomous scoring method is used where Plantations is given a score of 1, Consumer Products is given a score 2, Construction is given a score 3, Industrial Products is given a score 4 and Trading and Services is given a score of 5. This approach to measure industry sectors is consistent with prior studies (Bowrin 2013; Cooke 1992; Said, Omar and Abdullah 2013).

#### **4.5.3. Year**

The level of environmental disclosure is affected by the year as it reflects the actions taken by the company in adapting to different periods that the business environment experienced economic and governance changes.

In order to portray a better social image, the companies in Malaysia tend to increase the environmental disclosure practices (Sutantoputra 2009). The companies demonstrate

environmental disclosure activities in the annual reports in conjunction with the global crisis in order to establish a long term favourable corporate image for the companies. For example, Haniffa and Cooke (2005) discover an increase in the environmental disclosure after the Asian financial crisis in the year 1997.

Besides, governance changes such as the revision to Malaysian Code of Corporate Governance, CSR requirement and the introduction of CSR specific awards enhance the awareness in environmental disclosure. These changes motivate the companies to engage in higher level of environmental disclosure. Hence, the companies tend to disclose more environmental disclosures to defend their corporate reputation following the global crisis and governance changes. This thesis examines the level of environmental disclosure in Malaysia over the 3-year period from 2014 till 2016. It is expected the governance changes will affect the company's commitment to be accountable and transparent via corporate disclosure.

A dichotomous scoring method is utilized whereby a score of '1' for year 2014, '2' for year 2015 and '3' for year 2016. This scoring approach is consistent with prior studies (Haniffa and Cooke 2005; Muthén 1984; Said, Omar and Abdullah 2013).

#### **4.5.4. Profitability**

The level of environmental disclosure is influenced by the profitability of the company as the company has higher motivation to impress the stakeholders by being environmentally responsible in order to have continued support from the stakeholders. This is because good financial performance allows the managers to have resources to cover the cost of generating more environmental information. Ibrahim and Hanefah (2016), Suwaidan, Al-Omari, and Haddad (2004), and Al-Hamadeen and Badran (2014) document there is positive association between profitability and environmental disclosures.

Profitability is measured as lagged return on asset. The use of lagged return on assets allows the adjustment for the profitability and focus on relative performance across company. This helps to avoid any potential problems due to the current profitability



determined. Lagged return on assets is used due to the lag effect, for instance, the outcome of the investment of the companies can only be identified after one year period. This measurement is used by Anderson, Fornell, and Lehmann (1994), Yusoff, Mohamad, and Darus (2013) and Villiers and Staden (2011).

#### **4.5.5. Ownership Concentration**

The level of disclosure is highly dependent on the concentration of ownership, as they have the authority to dictate the management and exert influence on the management in their daily business activities. The level of environmental disclosure increases when the companies have higher ownership concentration where the companies have the inclination to disclose more information in order to meet the stakeholders demand on the environmental reporting requirements (Abdullah, Mohamed and Mokhtar 2011; Chau and Gray 2010).

However, the impact of ownership concentration in the level of environmental disclosure might have different results depending on the leadership of the board of directors. This is reflected by the prior studies conducted by Darus, Hamzah, and Yusoff (2013) where the study shows a higher demand from the stakeholders to disclose environmental performance when the concentration of ownership is lower. Naser et al. (2006) state that the concentration ownership in the hands of number of families and government turns accountability a small issue and thus, giving the companies little incentive to voluntarily disclose their environmental performances.

The ownership concentration is measured by the proportion of shares held by the top five shareholders in the companies which is consistent with previous studies such as Demsetz and Lehn (1985), Darus, Hamzah, and Yusoff (2013), and Abdullah, Mohamed, and Mokhtar (2011).

#### **4.5.6. Board Independence**

Independent directors play an important role in monitoring the management to act in the best interest of stakeholders. Ibrahim and Hanefah (2016) expound that independent directors are more effective than non-independent directors as they have resistance

towards the CEO's manipulation in fulfilling their duties to the stakeholders. Ibrahim and Hanefah (2016) also state that a higher proportion of independent directors would enhance the level of environmental disclosure and reduce the voluntary information cost, as they are independent of the business daily operations. Harjoto and Jo (2011) find that CSR is positively related to the percentage of independent board.

Board independence is measured as the proportion of independent directors on board. This measurement is used by Carter, Simkins, and Simpson (2003), Eng and Mak (2003), and Haniffa and Cooke (2005).

The operationalization of independent variables and control variables is summarised as follows:

**Table 4.2 Operationalization of Independent and Control Variables**

<b>Variables</b>	<b>Definition</b>	<b>Measurement</b>
<b>GEND</b>	Gender diversity	Ratio of female directors to the total number of directors on the board
<b>EDU</b>	Education diversity	Ratio of educated directors to the total number of directors on the board
<b>AGE</b>	Age of directors	Ratio of young board of directors (younger than 40 years) to total number of directors on the board
<b>NAT</b>	Nationality of directors	Ratio of non-Malaysian directors to total number of directors on the board
<b>SIZE</b>	Company size	Natural log of total assets of the company
<b>IND</b>	Industry of company	Dichotomous score of 1,2,3,4,5; industries classification: 1=Plantations, 2=Consumer Products, 3=Construction, 4=Industrial Products and 5=Trading and Services
<b>YEAR</b>	Year	Dichotomous score of 1, 2 and 3; year classification: 1=2014, 2=2015 and 3=2016
<b>PRO</b>	Profitability	Lagged Return on assets
<b>OWN</b>	Ownership Concentration	Percentage of shares held by the five largest shareholders in the company
<b>INDE</b>	Independent directors	Ratio of independent non-executive directors to the total number of directors on board

Note: Base=1 is used as the dichotomous score for industry of company and year.

#### 4.6. Model Specification

In order to examine the influence of board diversity on environmental disclosure over the three-year period from 2014 to 2016, estimates of the panel regression equation is as follows:

$$EDL_{it} = \beta_0 + \beta_1 GEND_{it} + \beta_2 EDU_{it} + \beta_3 AGE_{it} + \beta_4 NAT_{it} + \beta_5 SIZE_{it} + \beta_6 IND_{it} + \beta_7 PRO_{it} + \beta_8 OWN_{it} + \beta_9 INDE_{it} + \beta_{10} YEAR_{it} + \varepsilon_{it}$$

where:

<b>EDL</b>	Environmental disclosure level
<b>GEND</b>	Gender
<b>EDU</b>	Education
<b>AGE</b>	Age
<b>NAT</b>	Nationality
<b>SIZE</b>	Company size
<b>IND</b>	Industry of company
<b>PRO</b>	Profitability based on return on assets
<b>OWN</b>	Ownership Concentration
<b>INDE</b>	Independent directors
<b>YEAR</b>	Year
$\beta_0$	Constant
$\beta_1 - \beta_{10}$	Regression coefficient
$\varepsilon$	Error term
$t$	Represents time dimension (year)
$i$	Represents cross – section dimension (company)

#### 4.7. Data Statistical Analysis

This thesis uses descriptive and panel data statistical techniques to test the overarching research proposition and hypotheses developed. Descriptive statistics provide a general description of the data. The descriptive statistics comprise minimum, maximum, mean, and standard deviation for each variable in this thesis. Tests of mean of EDI are conducted for evaluation of the change in the level of environmental disclosure over the three-year period. In addition, Pearson correlation is conducted to depict the initial correlation of the variables and provide the earlier test of multicollinearity.

Further, this thesis conducts panel data analysis to test the determinants in influencing the level of environmental disclosures. A total of 150 companies are used as the final sample for this thesis, which translates a total of 450 company-year observations for the quantitative empirical analysis. The three-year period data provides a sufficient data set in allowing panel data analysis and generating substantial inferences from the results in order to improve the explanation of the error terms of the regression. Control variables are included to control for any confounding effects they may have on the dependent variable.

Time series technique is not appropriate for this thesis with three-year period data as it requires longer period for analysis. Similarly, Ordinary Least Squares (OLS) regression is not suitable in this thesis as it is unable to control for unobserved and time-constant company effects. Instead, panel data caters for both time series and cross-sectional data, and supports observations on the same units in several different time periods.

Hsiao (2003) and Klevmarken (1989) highlight the benefit of panel data in controlling for individual heterogeneity. Firstly, panel data highlights that individuals, companies, states or countries are heterogeneous. The individual characteristics that are not observed are described as unobserved heterogeneity. Heterogeneity is shown when the micro units are different from each other in fundamental unmeasured ways. The estimated effects of the variables are biased when heterogeneity influences the variable of interest and correlate with the observed explanatory variables. Panel data is able to control the individual and time invariant variables by using dummy and difference estimator. Secondly, panel data is more informative, more variability, less collinearity among the variables, more degree of freedom and greater efficiency (Baltagi 2008).

Thirdly, panel data is a better option to study the dynamics of adjustments. Panel data observes same individuals in different periods without requiring lengthy time series by exploiting information on the dynamic reactions of each of several individuals. Panel data is necessary to study the individual's experience and behaviour in adjusting over time. Panel data is crucial in evaluating the implementation of policy as this technique

provides a better identification of the factors that affect the level of environmental disclosure.

Panel data promotes the identification and measurement of the effects that are not detectable in pure cross-section or pure time-series data. It allows the construction and testing on a more complicated behavioural model rather than merely on cross-section or time-series data. Hence, panel data analysis is chosen as the best appropriate technique to address these issues and to overcome the variable omission problem.

There are several estimation methods in panel data. The most general and frequently used panel data models are fixed effects model and random effects model (Baltagi 2008). The respective models produce different estimates as the error structure is treated differently. In the main, random effects assume individual effects are drawn independently from some probability distribution whereas, fixed effects assume individual effects are constants.

Fixed effects model assumes the individual specific effects are individual specific intercepts to be estimated, or more crucially when correlated with the included variables. Fixed effects model is chosen if the idiosyncratic errors are serially uncorrelated and homoscedastic (Wooldridge 2010). The unobserved individual effects are correlated with the included variables by using fixed effects model.

Random effects model assumes individual specific effects to be a random variable with mean zero and variance and more crucially uncorrelated with the independent variables. Greene (2003) expounds that this approach reduces the number of coefficients to be estimated but if the assumptions are not valid, the estimates might not be consistent. Random effects model uses Generalised Least Squares (GLS) estimator or also known as random effect estimator to identify the possible correlation between the unobserved differences and the error term. GLS method is recommended due to its ability to handle sample data that is not normally distributed, and having heteroskedasticity and autocorrelation problems (Gujarati 2003). Furthermore, Gujarati (2003) states that GLS

considers the variability in the predictor and explanatory variables into account explicitly, and thus, is able to produce estimators that are the best linear unbiased estimator (BLUE).

The comparison of estimators of the tested model and model selection are determined using Hausman specification test (Ibrahim and Hanefah 2016; Saleh, Zulkifli and Muhamad 2008; Hausman 1978). Hausman test is conducted to determine the choice of model when comparing the estimates of the fixed and random effects models. The Hausman specification test evaluates the significance of an estimator against an alternative estimator. Hausman (1978) expounds that Hausman test analyses a more efficient model against a less efficient but consistent model in ensuring the consistency of the results produced from the more efficient model. Stock and Watson (2012) indicate that fixed effects model tends to have consistent results whereas; random effects model provides a more efficient model to run. Hence, the random effects model is first conducted and tested using Hausman test to determine whether it is statistically justifiable to do so (Chen 2006). If the null hypothesis of Hausman test is rejected, one or both estimator is inconsistent. Hence, fixed effects model should be chosen.

#### **4.8. Regression Diagnostics**

Diagnostic checks for outliers, heteroskedasticity, multicollinearity, and serial correlation are performed after obtaining an appropriate model.

First, this thesis identifies any outliers that affect the reliability of the regression model using Cook's Distance Test. The influential outliers are found in the leverage versus residuals square plots. If the outliers are found to be influential, the outliers are removed from the data or counter them using robust regression models. Fox (2015) recommends the use of robust regression model which gives different weights to the observation, and is suitable for non-normal and heavy-tailed error distributions.

Second, heteroskedasticity problem is checked in this thesis using Breusch-Pagan test. Wooldridge (2010) states the significance of variables might not be reliable as the ordinary least square estimate is inefficient. Alternatively, a plot of residuals versus

fitted values can be used to check heteroskedasticity problem. Further, Haan and Levin (1997) recommend the use of robust covariance matrix estimation (Sandwich estimator) while Long and Ervin (2000) recommend the use of HC3 correction as it gives less weight to influential observations.

Third, multicollinearity problem checked in this thesis. The occurrence of multicollinearity problem happens when the independent variables are correlated with each other. Belsley, Kuh, and Welsch (1980) explain multicollinearity causes an inaccuracy in the individual p-values and wide confidence intervals on the regression coefficients. Variance Inflation Factor (VIFs) is determined to identify the multicollinearity problem. If the mean VIF is greater than 10, this indicates a potential problem of multicollinearity (Field 2009).

Lastly, serial correlation test is conducted to examine the existence of serial correlation problem in this thesis. Serial correlation, also known as autocorrelation, is the relationship between a given variable and itself over various time intervals. The error terms in a time series transfer from one period to another. Breusch-Godfrey/Wooldridge test for serial correlation in panel models is used to detect serial correlation problem. Torres-Reyna (2007) states that serial correlation test are mainly applicable for macro panels with long time series. Hence, serial correlation may not pose a threat to micro panels, as in the case of this thesis with the 3-year data set.

#### **4.9. Summary**

This chapter discusses the measurement of variables and statistical analysis techniques employed in this thesis. This thesis uses quantitative techniques of statistical analysis to examine the suggested hypotheses over three-year periods. A total of 150 sample companies are selected from the Main Board of Bursa Malaysia in each period, which represents a total of 450 company-year observations used for the quantitative analysis in this thesis. Annual reports or stand-alone sustainability reports are used as the main sources for environmental disclosure measurement, while the data of other independent and control variables are primarily obtained from annual reports.



Panel data analysis is used in this thesis to distinguish between residual heterogeneity associated with changes over time and across companies. Panel data analysis enables more observations by pooling individual and time dimensions. By using panel data, there is more variability and less collinearity as is often the case in time series. Panel data reduces the problem of multicollinearity which is normally encountered in distributed lag model.

The results of descriptive statistics and panel data analysis are presented in Chapter 5.

## **CHAPTER 5. RESULTS AND DISCUSSIONS**

### **5.1. Introduction**

The previous chapter describes the research methodology used in this thesis. This chapter gives an insight on the descriptive statistics and the results of the panel data analysis for the variables selected in this thesis. Data analysis is conducted using R statistical software. According to Croissant and Millo (2008), Linear Models for Panel Data (plm) package for R produces straightforward estimation of linear panel models. The plm package also provides functions for the estimations of a wide variety of models and to make robust inference (Croissant and Millo 2008).

The descriptive statistics of Environmental Disclosure Index score is explained in Section 5.2. Section 5.3 reports the descriptive statistics for independent variables. Pearson's Correlation among the variables is shown in Section 5.4. The assessment of the validity of the model and the panel data analysis model are explained in Section 5.5 and 5.6 respectively. Section 5.7 presents the regression diagnostic tests. The panel data analysis results are revealed in Section 5.8. The summary of this chapter is provided in Section 5.9.

### **5.2. Descriptive Statistics of Environmental Disclosure Index (EDI) Scores**

This section reports the descriptive statistics on the level of environmental disclosure of Malaysian public listed companies. The level of environmental disclosure practices is measured by using EDI that consists of a total of 45 disclosure items (29 'hard' disclosure and 16 'soft' disclosure items) on environmental information of each of the sample companies.

Figure 5.1 presents the proportion of sample companies' environmental disclosure levels. Graphically, EDI is skewed to the left, ranging from nil to 30.00 per cent. This reflects a low level of environmental information disclosed in the annual reports of sample companies. This is consistent with the results reported by previous studies in Malaysia (Ahmad and Haraf 2013; Said, Zainuddin and Haron 2009). About 45.00 per

cent of the sample companies disclose in the range of 11.00 per cent to 20.00 per cent of environmental information in their annual reports, whereas less than 1.00 per cent of the companies disclose more than 71.00 per cent of environmental information. Notwithstanding the efforts and initiatives taken by the government of Malaysia, the level of environmental disclosure remains low among Malaysian public listed companies.

**Figure 5.1 Percentage of Malaysian Listed Companies**

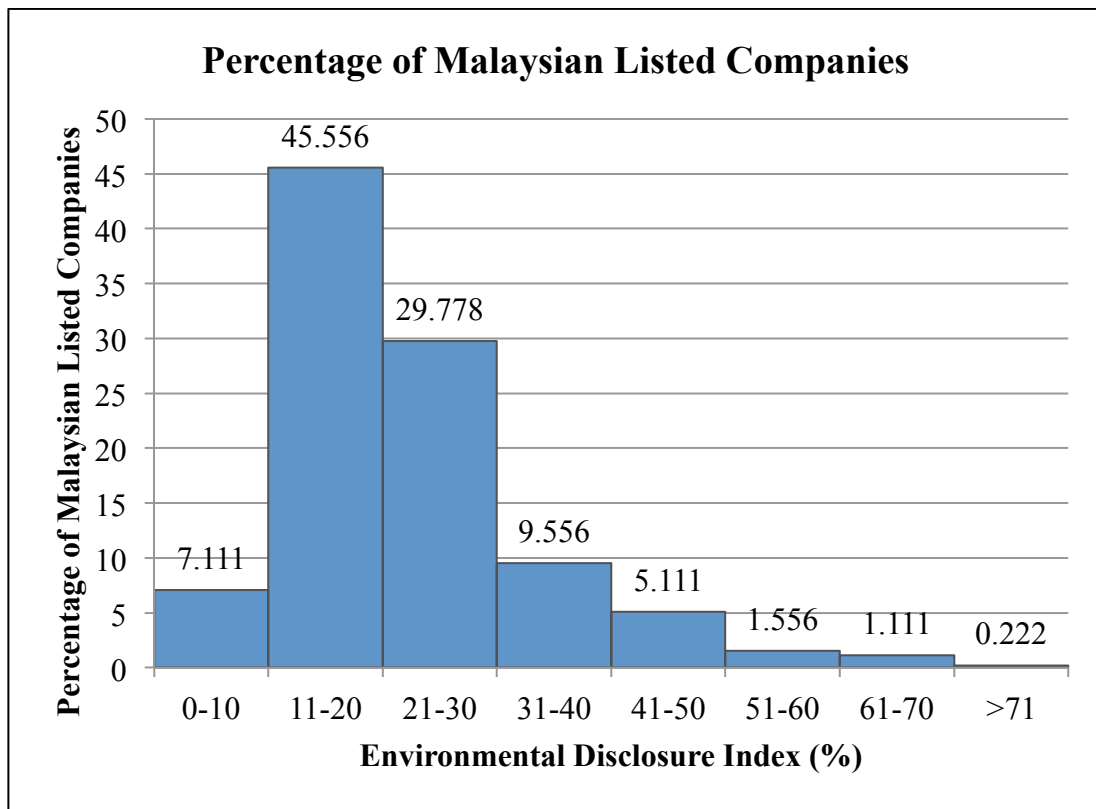


Table 5.1 displays the descriptive statistics of environmental disclosure index (EDI) over the observation periods. As reported, EDI increased from a mean of 14.00 per cent in 2014 to 27.10 per cent in 2016. The increase in the level of environmental disclosure is greater particularly from 2014 to 2015 although there is a slight increase between 2015 and 2016. Notwithstanding this, the overall level of environmental disclosure is generally low ranging from 14.00 per cent to 27.10 per cent over the three-year period from 2014 to 2016.

**Table 5.1 Descriptive Statistics of Dependent Variable for Each Year (n=150)**

Year	Minimum	Maximum	Mean	Standard Deviation
2014	0.044	0.333	0.140	0.051
2015	0.111	0.622	0.231	0.109
2016	0.111	0.756	0.271	0.114

One-Way Repeated-Measures ANOVA is performed to examine the statistical significance of differences between the means of the EDI over the study periods, as reported in Table 5.2. There is a statistically significant increase in the level of the environmental disclosure over the three-year study period. The increase in means EDI is statistically significant at the 1% level ( $p < .001$ ).

**Table 5.2 One-Way Repeated-Measures ANOVA Results (n=450)**

Degrees of Freedom Numerator	2.000
Degrees of Freedom Denominator	298.000
F-Ratio	162.389
p-value	0.000**

The pairwise comparison test is conducted to determine whether the means of the distribution of differences in values of EDI is zero. Table 5.3 reports that the increases in means of EDI between two periods (2014-2015, 2015-2016, 2014-2016) are statistically significant at the 1% level.

**Table 5.3 Pairwise Comparison Results (n=150)**

Year	Mean Difference	Degrees of Freedom	t-value	p-value
2014-2015	0.091	211.050	-9.234	0.000**
2015-2016	0.040	297.32	-3.125	0.000**
2014-2016	0.131	205.82	-12.818	0.000**

As stated in Chapter 3, the overarching research proposition put forward in this thesis is:  
*There is a significant increase in the level of environmental disclosure by Malaysian listed companies from 2014 to 2016.*

This overarching research proposition is supported by the results as the differences in means of EDI are statistically significant at the 1% level.

The environmental disclosure index comprises 7 categories of disclosures, namely A1 – “Governance structure and management system”, A2 – “Credibility”, A3 – “Environmental performance indicators”, A4 – “Environmental spending”, A5 – “Vision and strategy claims”, A6 – “Environmental profile”, and A7 – “Environmental initiatives”. As tabulated in Table 5.4 A1-A4 constitutes ‘hard’ disclosure items with A2 – “Credibility” being the highest percentage of environmental information disclosed (65.28 per cent) over the three periods. A large majority of the companies report environmental awards or ISO 14001 certification received. Prior studies conducted by Ahmad and Haraf (2013), Sumiani, Haslinda, and Lehman (2007), and Ahmad and Sulaiman (2004) also note the same type of information commonly disclosed by Malaysian public listed companies. Over the three years, sample companies disclose A1 – “Governance Structure and Management System” information with an average of 20.89 per cent. Although the proportion of companies disclosing A3 – “Environmental Performance Indicators” is about 11.33 per cent, the trend of this information communicated increases over the years. A4 – “Environmental Spending” is least disclosed by sample companies.

**Table 5.4 Score for Hard Disclosures by Category (n=150)**

	<b>Hard Disclosures</b>	<b>2014 (%)</b>	<b>2015 (%)</b>	<b>2016 (%)</b>	<b>Total (%)</b>
<b>A1</b>	Governance structure and management systems	29.68	17.69	19.81	20.89
<b>A2</b>	Credibility	67.72	69.76	59.97	65.28
<b>A3</b>	Environmental performance indicators	0.00	9.56	18.22	11.33
<b>A4</b>	Environmental spending	2.59	3.00	2.00	2.50

Table 5.5 presents A5-A7 “soft” disclosure items. A5 – “Vision and strategy claims” shows the highest percentage of ‘soft’ disclosure information disclosed (50.29 per cent) over the observation periods. While about 34.64 per cent of sample companies disclosed

A7 - “Environmental Initiatives”, only 15.06 per cent disclosed A6 – “Environmental Profile”, albeit such information disclosure increased over the study periods.

**Table 5.5 Score for Soft Disclosures by Category (n=150)**

	<b>Soft Disclosures</b>	<b>2014 (%)</b>	<b>2015 (%)</b>	<b>2016 (%)</b>	<b>Total (%)</b>
<b>A5</b>	Vision and strategy claims	53.33	53.50	46.18	50.29
<b>A6</b>	Environmental profile	3.17	10.37	25.11	15.06
<b>A7</b>	Environmental initiatives	43.50	36.13	28.71	34.64

Table 5.6 shows the ratio of ‘hard’ disclosure to total disclosure ratio and the ratio of ‘soft’ disclosure to total disclosure. The ‘soft’ disclosure scores ratios are 63.36 per cent, 55.04 per cent, and 59.64 per cent in years 2014, 2015, and 2016 respectively. On the other hand, the ‘hard’ disclosure scores ratios are 36.64 per cent, 44.97 per cent, and 40.37 per cent in years 2014, 2015, and 2016 respectively. The results show that the companies in Malaysia disclose environmental information that are mainly ‘soft’ in nature leading to questions on the quality of environmental information disclosed that is able to fulfil the demand of the stakeholders.

**Table 5.6 Comparison of Soft and Hard to Total Disclosure Scores (n=150)**

<b>Disclosure scores (ratio)</b>	<b>Average Scores</b>		
	<b>2014</b>	<b>2015</b>	<b>2016</b>
<b>Soft/total (%)</b>	63.36	55.04	59.64
<b>Hard/total (%)</b>	36.64	44.97	40.37

Further, Table 5.7 presents the descriptive statistics of ‘hard and ‘soft’ EDIs. The mean ‘soft’ EDI of 36.20 per cent is higher than the mean ‘hard’ EDI of 13.30 per cent. The minimum ‘soft’ disclosure is 6.30 per cent while the maximum is 81.30 per cent. On the other hand, the minimum and maximum of ‘hard’ disclosure is nil and 75.90 per cent respectively. The result shows that the samples companies disclose more ‘soft’ environmental information, instead of ‘hard’ information. Hence, in response to Research Question 1, the environmental information disclosed in annual reports of Malaysian public listed companies are more inclined to ‘soft’ disclosure items mainly in the category of vision and strategy claims (A5).

Overall, the average level of environmental disclosure is about 21.40 per cent, which reflects that the companies in Malaysia disclose about 9 out of 45 items in the

environmental disclosure instrument used in this thesis. The result shows an improved disclosure of environmental information compared to the prior studies conducted. For example, Ahmad and Haraf (2013) and Said, Zainuddin, and Haron (2009) report the environmental disclosure level of 13.33 per cent and 13.90 per cent respectively in Malaysia.

**Table 5.7 Descriptive Statistics of EDI (n=450)**

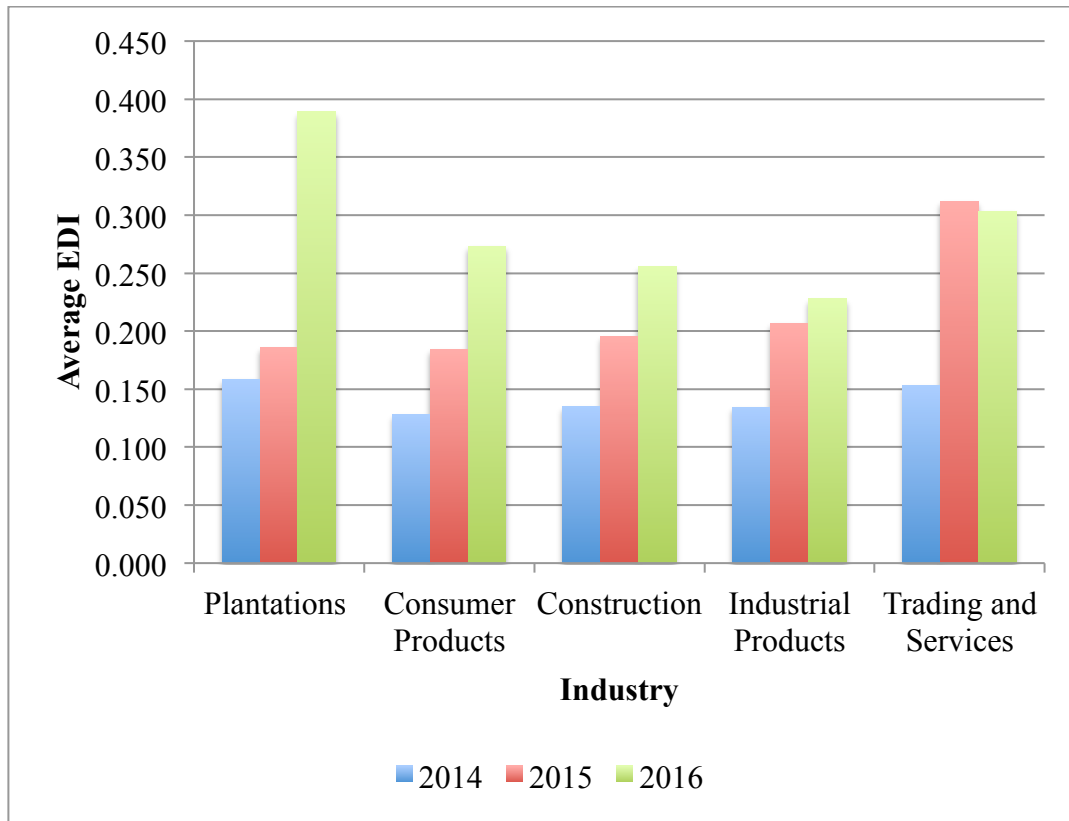
<b>Variables</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Standard Deviation</b>
<b>Hard</b>	0.000	0.759	0.133	0.102
<b>Soft</b>	0.063	0.813	0.362	0.151
<b>Total</b>	0.044	0.756	0.214	0.110

Notwithstanding the increase in the level of environmental disclosure, it still remains low among the public listed companies in Malaysia despite of the increasing adverse media attention and public concern on the rapid rates of urbanization and the intensification of environmental impacts from industry. The corporate environmental reporting in Malaysia is relatively low compared to the developed countries such as United States (Dhaliwal et al. 2011), United Kingdom (Xiao et al. 2005), and Dutch (Burgwal and Vieira 2014). This raises question on the reasons of such low, general and descriptive in nature of environmental disclosure in Malaysia, which could be due to the lack of recognised disclosing framework, cost of disclosing and the concern of the reader’s reaction towards the corporate disclosure (Perry and Singh 2001).

Figure 5.2 shows the average EDI by industry sectors from 2014 to 2016. Plantations sector show the increasing trend of EDI over the three years under study, followed by Consumers Products and Construction sectors. The EDIs recorded in Trading and Services sector increased significantly between 2014 and 2015 but plateaued between 2015 and 2016.



**Figure 5.2 Averages EDI by Industries from 2014 to 2016**



The average EDIs by industries and years are tabulated in Table 5.8. The level of environmental disclosure of Malaysian companies has risen considerably over the 3-year period. The EDI in 2014 is averaged at 14.20 per cent. It increases to 21.70 per cent in 2015, and scales up further to 29.00 per cent in 2016. By industry, both Plantations, and Trading and Services sectors record higher average EDIs of 24.50 per cent and 25.60 per cent respectively. Over the three periods, Trading and Services sectors fetched the highest average EDI with the significant increase in environmental information disclosure noted between 2014 and 2015. The environmental information communication pattern in Plantations sector is low in the first two years but picked up greatly between 2015 and 2016. The average EDIs in the other three industry sectors are similar.

**Table 5.8 Average EDI by Industries from 2014 to 2016**

<b>Industry/Year</b>	<b>Year 2014</b>	<b>Year 2015</b>	<b>Year 2016</b>	<b>Average EDI (Industry)</b>
<b>Plantations</b>	0.158	0.186	0.389	0.245
<b>Consumer Products</b>	0.128	0.184	0.273	0.195
<b>Construction</b>	0.135	0.195	0.256	0.195
<b>Industrial Products</b>	0.134	0.207	0.228	0.190
<b>Trading and Services</b>	0.153	0.312	0.304	0.256
<b>Average EDI (Year)</b>	0.142	0.217	0.290	

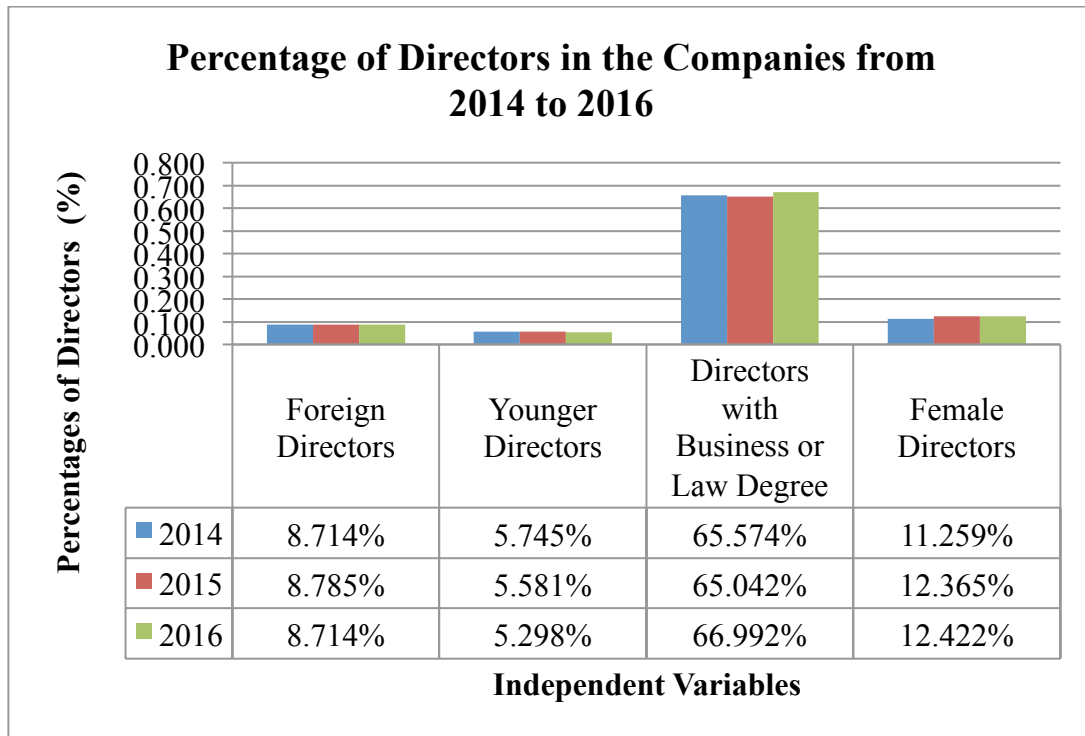
### 5.3. Descriptive Statistics for Independent Variables

Figure 5.3 displays the board diversity characteristics considered in this thesis for the periods from 2014 to 2016. The number of foreign directors remains stable throughout the three-year period at about 8.74 per cent. Similarly, the number of younger directors is relatively less and stable, averaged about 5.54 per cent over the observation periods. The proportion of the directors with business or law education is higher and consistent from 2014 to 2016, averaged at 65.87 per cent.

In terms of gender diversity, the number of female directors experiences a slight increase from 11.26 per cent in 2014 to 12.37 per cent in 2015, and increases further to 12.42 per cent in 2016. This shows that the companies are taking the initiative to appoint female directors on board following the requirement of the government to allocate a minimum of 30.00 per cent of the board to female by 2016 (Securities Commission Malaysia 2011). Nonetheless, the proportion of female directors on board is still far from the required threshold.

The results indicate that the female representation in the board of directors, foreign directors and younger directors are minimal. The corporate board of directors in Malaysian listed companies are still not highly diversified. The reason of this could be due to the conservative stance adopted in sourcing, recruiting and appointing directors with diversified characteristics.

**Figure 5.3 Percentages of Directors in the Companies from 2014 to 2016**



The descriptive statistics for independent variables are as shown in Table 5.9. The table indicates the average of foreign directors on board is 8.70 per cent. The findings also show a mean of 5.50 per cent comprises young directors who are below 40 years old. In terms of education diversity, the mean of the directors possessing business degree and legal degree qualifications is 65.90 per cent. Table 5.9 also presents the average female directors on board is 12.00 per cent, with a minimum value of zero and a maximum value of 84.60 per cent. The findings reflect that 18 out of 150 companies have at least one female director on the board. This figure is comparatively low to other countries. For instance, the mean of female directors on board in Norway in year 2007 is 39.07 per cent (Thomsen et al. 2009). Bear, Rahman, and Post (2010) record that 90.00 per cent of Fortune 500 companies has a minimum of one female representative in the board of directors.

**Table 5.9 Descriptive Statistics of Independent Variables (n=450)**

Variables	Minimum	Maximum	Mean	Standard Deviation
Nationality	0.000	1.000	0.087	0.172

<b>Age</b>	0.000	0.800	0.055	0.116
<b>Education</b>	0.143	1.000	0.659	0.203
<b>Gender</b>	0.000	0.846	0.120	0.123

#### 5.4. Pearson's Correlation Test

The results of Pearson's Correlation are reported in Table 5.10. Pearson's Correlation is run to give a preliminary idea on the strength and direction of the associations of the variables. It is conducted to check if there is any concern on multicollinearity among the variables.

Although positive correlations are observed between EDI and nationality, education, and gender, the correlations are not statistically significant. The directionality of these correlations is consistent with that hypothesised.

There is a negative and statistically significant ( $p < .001$ ) correlation between age and EDI. However, the strength of the correlation between the variables is small at 0.198. This shows that younger directors have negative correlation with environmental disclosure. The directionality of the correlation is not consistent with that hypothesised.

For the control variables, company size shows a positive correlation with EDI with correlation coefficient of 0.404. The correlation for profitability and the level of environmental disclosure is also positive with a small correlation coefficient of 0.130. Similarly, ownership concentration is found to be positively correlated with EDI with small correlation of 0.125. Board independence is negatively correlated to the level of environmental disclosure. The strength of the correlation is small at 0.050.

Overall, Pearson's correlation coefficients between explanatory variables are not a concern. The maximum correlation coefficient is 0.404, between company size and EDI. Thus, multicollinearity may not be a concern in this thesis. According to Gujarati (2003), multicollinearity is a problem when the correlation coefficient between two variables is more than 0.800. The aforementioned possible predictor variables are included in the full regression analysis in the next section.

**Table 5.10****Pearson's Correlation Test (n=450)**

<b>Variables</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
<b>1. Nationality</b>	1					
<b>2. Age</b>	.065	1				
<b>3. Education</b>	.100*	-.083*	1			
<b>4. Gender</b>	.164**	.085*	.022	1		
<b>5. Company Size</b>	.068	-.189**	.113**	.185**	1	
<b>6. Profitability</b>	.090*	-.090*	-.044	.062	.099*	1
<b>7. Ownership Concentration</b>	.250**	.017	.118**	.064	.033	.207**
<b>8. Board Independence</b>	-.037	-.065	.127**	-.063	-.124**	-.242**
<b>9. Environmental Disclosure</b>	.060	-.198**	.154**	.112**	.404**	.130**

Note: Association of \*\* represents correlation is significant at the 0.01 level and \* represents correlation is significant at the 0.05 level.

The result is based on one tailed test.

### 5.5. Assessing the Validity of the Regression Model

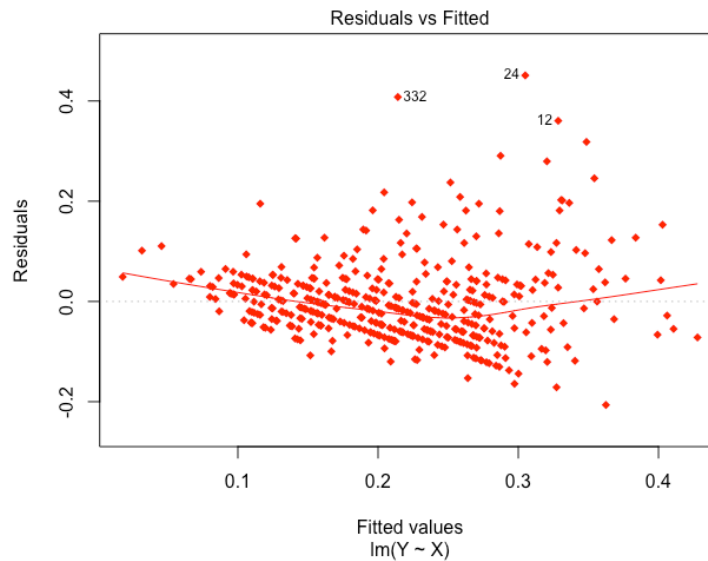
Before proceeding to the panel regression analysis, the assumptions about the data are checked to assess the validity of the model used is robust and free from regression related problems such as non-linearity, non-normality, and homoscedasticity.

The linearity assumption is checked by conducting significance test for linear regression as tabulated in Table 5.11. The result shows that there is a significant association between the variables in the linear regression model of the data ( $p < 0.05$ ).

<b>Residual Standard Error</b>	0.083
<b>Adjusted R-squared</b>	0.430
<b>F-statistic</b>	34.900
<b>p-value</b>	0.000**

This is further illustrated in the Residual versus Fitted plot as shown in Figure 5.4. The residual plot shows no fitted pattern (the red line is approximately horizontal at zero). This suggests that assumption of linear relationship between the predictors and the outcome variables is met.

**Figure 5.4 Residual versus Fitted Plot**

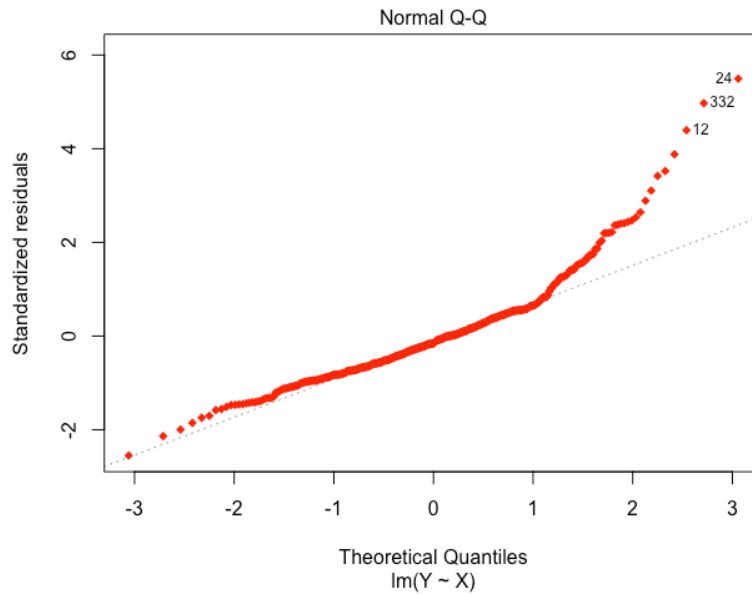


Second, a Henze-Zirkler test is conducted to check for multivariate normality of the residuals of the data. According to the Henze-Zirkler’s test results in Table 5.12, the data does not follow a multivariate normal distribution, suggesting a multivariate non-normality of the data ( $p < 0.05$ ). This is further illustrated in the Q-Q residual plot as shown in Figure 5.5. However, in practical, it is acceptable to have non-normality in residual when  $N$  is large as a smallest deviation from perfect normality tends to lead to a significant result (Chen 2006). In order to correct this problem, Robust Covariance Matrix Estimator is used in this thesis as it takes into account joint asymptotic distributions of the corresponding estimators for the shape matrix and scale (Frahm 2009). Baltagi (2008) expounds that the estimator is consistent and asymptotically normal. As long as the sample size is more than 200, the asymptotic distribution is a good approximation of the small sample distribution.

**Table 5.12 Assessment of Multivariate Normality**

<b>HZ</b>	1.509
<b>p-value</b>	0.000

**Figure 5.5 Normal Q-Q Residual Plot**



Third, Bartlett test for homogeneity of variance is conducted. Based on the results shown in Table 5.13, the variances are equal among the different groups ( $p < 0.05$ ). In other words, heteroskedasticity exists when there is unequal dispersion.

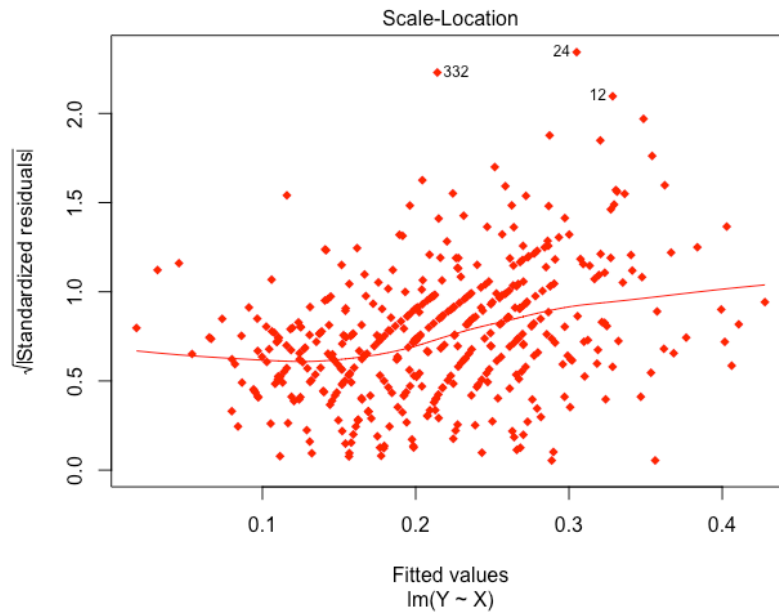
**Table 5.13 Bartlett Test Results**

<b>Bartlett's K-squared</b>	25543.000
<b>Degree of Freedom</b>	10.000
<b>p-value</b>	0.000**

This is further illustrated in Scale-Location plot to check the homogeneity of variance of the residuals (homoscedasticity). A horizontal line with equally spread points shows homoscedasticity. This is not the case in this thesis as shown in Figure 5.6. The variability (variances) of the residual points increases with the value of the fitted outcome variable. This suggests non-constant variances in the residuals errors (heteroskedasticity). In order to rectify the heteroskedasticity problem, robust covariance matrix is used in this thesis, which is further elaborated in Section 5.8.



**Figure 5.6 Scale-Location Plots**



### 5.6. Panel Data Analysis Model

Panel data analysis is employed to examine the three-year data (2014-2016). Panel data analysis has three models of estimation, namely pooled OLS, fixed effects model (FEM), and random effects model (REM). In order to determine the best and most appropriate model for the data analysis, two basic tests, being Breusch-Pagan Lagrangian Multiplier (LM) test and Hausman test are conducted.

First, LM test is used to discriminate between Pooled OLS and the Random Effects Model. The null hypothesis in the LM test is that variances across entities are zero. The results of LM test for random effects versus OLS are presented in Table 5.14. Based on the results, the null hypothesis is rejected ( $p < 0.05$ ). Hence, random effects model is more appropriate than the Pooled OLS model. Also, LM test is carried out to discriminate between OLS and Fixed Effects Model. Table 5.14 shows a significance p-value of LM test ( $p < 0.05$ ) which indicates that fixed effects model is more appropriate than OLS model. In other words, there are company-specific effects in the data.

**Table 5.14 Breusch-Pagan Lagrangian Multiplier Test Results**

LM Test	p-value
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<b>Random Effects versus OLS</b>	0.000**
<b>Fixed Effects versus OLS</b>	0.000**

Next, the second test in panel data analysis seeks to determine whether random or fixed effects model is a more appropriate estimator. Hausman (1978) test is performed in order to choose between fixed or random effects model as the most appropriate estimator to treat the error structure. The null hypothesis of Hausman test is the estimates with random effects model more efficient. Hence, the rejection of null hypothesis indicates fixed effects estimator is more consistent and therefore, should be adopted. In the case of fixed effects regression, any variables such as industry that do not vary over time should be excluded. The results of Hausman test are presented in Table 5.15, which suggests that the rejection of null hypothesis ( $p < 0.05$ ), Hence, the fixed effects model is a more appropriate estimator in this thesis.

<b>Chi-square</b>	43.036
<b>p-value</b>	0.000**

This thesis seeks to discover the association between the dependent variable which is the level of environmental disclosure practices by Malaysian public listed companies and the independent variables, namely nationality, age, education and gender diversity in the board of directors. The process of determining the effect of each variable is conducted using fixed effects model.

Estimates of the regression equation are as follows:

$$EDL_{it} = \beta_0 + \beta_1 GEND_{it} + \beta_2 EDU_{it} + \beta_3 AGE_{it} + \beta_4 NAT_{it} + \beta_5 SIZE_{it} + \beta_6 IND_{it} + \beta_7 PRO_{it} + \beta_8 OWN_{it} + \beta_9 INDE_{it} + \beta_{10} YEAR_{it} + \varepsilon_{it}$$

where:

<b>EDL</b>	Environmental disclosure level
<b>GEND</b>	Gender
<b>EDU</b>	Education
<b>AGE</b>	Age
<b>NAT</b>	Nationality

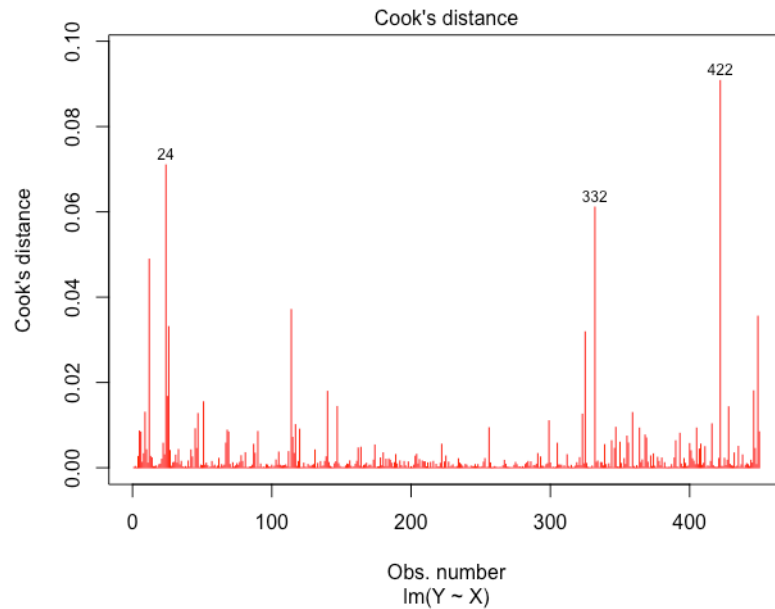
<b>SIZE</b>	Company size
<b>IND</b>	Industry of company
<b>PRO</b>	Profitability based on return on assets
<b>OWN</b>	Ownership Concentration
<b>INDE</b>	Independent directors
<b>YEAR</b>	Year
$\beta_0$	Constant
$\beta_1 - \beta_{10}$	Regression coefficients
$\varepsilon$	Error term
$t$	Represents time dimension (year)
$i$	Represents cross – section dimension (company)

### 5.7. Regression Diagnostics

After obtaining the appropriate model, various diagnostic checks are performed. This section shows the results of research diagnostics carried out in order to ensure the model used is robust and free from regression related problems such as non-linearity, non-normality, heteroskedasticity, dependence of errors in variables, influential data and collinearity. The assumptions on the data collected are checked to enhance the validity of the regression model.

Detecting outlier is one of the required statistical diagnostics for multiple regression models. The graph of leverage-versus-residual-squared is used to assess the presence of outliers. It is the measure of how far an independent variable deviates from its mean. Cook's distance test is used to detect if any outliers are influential. This test measures how much an observation influences the overall model or predicted values. When Cook's Distance value is more than 1, it indicates big outlier problem. Figure 5.7 shows that Cook's Distance values of all data is less than 1, indicating there is no outlier problem. Hence, all of the observations remain in the sample of this thesis.

**Figure 5.7 Cook's Distance versus Observation Number**



Multicollinearity issue refers to the relationship between independent variables in this thesis. Gujarati and Porter (2009) state that a problem of multicollinearity is noted when the independent variables are highly correlated with each other. Acock (2008) reveals that multicollinearity can lead to a difficulty in determining the correct variable as it affects the reliability of estimates. Furthermore, multicollinearity problem will have an effect on the evaluation of the significance variables in regression. Pearson's correlation test conducted in Section 5.4 show that multicollinearity is not a concern in this thesis. In addition, multicollinearity problem can be detected using Variance Inflation Factor. Pallant (2010) states that multicollinearity problem exists if the VIF value exceeds 10. The results for tolerance and VIF depict in Table 5.16.

**Table 5.16 Multicollinearity among Variables**

<b>Variables</b>	<b>VIF</b>	<b>Tolerance</b>
<b>Company Size</b>	1.123	0.890
<b>Profitability</b>	1.129	0.886
<b>Ownership Concentration</b>	1.134	0.882
<b>Board Independence</b>	1.119	0.894
<b>Year</b>	1.006	0.994
<b>Industry Type</b>	1.066	0.938
<b>Nationality</b>	1.106	0.904
<b>Age</b>	1.085	0.922
<b>Education</b>	1.086	0.921
<b>Gender</b>	1.093	0.915

All the VIF values do not exceed 10 which indicate no multicollinearity concern. This result is supported in Pearson's Correlation reported in Section 5.4.

Third, serial correlation is checked in this model. According to Torres-Reyna (2007), serial correlation normally applies to macro panels with long time series. Serial correlation is not a problem in micro panels (with very few years). Wooldridge test for serial correlation in panel models is conducted to detect serial correlation problem. Based on the results in Table 5.17, serial correlation exist in this model ( $p < 0.05$ ).

**Table 5.17 Wooldridge Test Results**

<b>Chi-square</b>	149.020
<b>p-value</b>	0.000**

Besides, heteroskedasticity is checked in this model. The Breusch-Pagan/Cook-Weisberg test is conducted in order to detect this problem. Based on the results in Table 5.18, the initial test suggests heteroskedasticity problem is present ( $p < 0.05$ ).

**Table 5.18 Breusch-Pagan/Cook-Weisberg Test Results**

<b>Degree of Freedom</b>	158.000
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<b>p-value</b>	0.000**
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The heteroskedasticity and serial correlation tests are undertaken to ensure the data are sufficient and the results are not misleading (Baltagi 2008). In order to rectify heteroskedasticity and serial correlation, Robust Covariance Matrix Estimation is conducted using Sandwich Estimator. The thesis pursued “Arellano” estimator as suggested by Arellano (1987) that gives a neat way of obtaining standard errors for fixed effects estimator that are robust to heteroskedasticity and serial correlation of arbitrary form. This thesis also uses “HC3” correction as suggested by Long and Long and Ervin (2000) because it gives less weight to influential observations. Section 5.8 further explains the Fixed Effects Model (FEM) analysis after correcting for heteroskedasticity and serial correlation.

### **5.8. Panel Regression Results**

Panel data analysis is employed to examine the three-year data (2014–2016). As a recap, Breusch-Pagan Lagrange Multiplier test and Hausman test are conducted in Section 5.6, and concluded that FEM is the most efficient estimator for this thesis. Further, FEM with robust covariance matrix estimation is used in this thesis in order to rectify heteroskedasticity and serial correlation.

Table 5.19 shows a summary of the regression results based on the selected model. The hierarchical regression technique is used in order to control for the confounding effects by control variables identified in the thesis (Pallant 2010). When only control variables are entered, the explanatory power of the model as indicated by the value of adjusted R-square is 23.90 per cent.

The second panel regression is run with both independent and control variables entered, the explanatory power of the model has improved slightly with the adjusted R-square of 25.50 per cent. The model is highly significant ( $p < .001$ ). The adjusted R-square of 25.50 per cent obtained in this thesis is similar to Esa and Ghazali (2012) although Haji (2013) reports a better adjusted R-square of 33.70 per cent.

**Table 5.19 Summary of Fixed Effects Model Regression Results**

<b>Model</b>	<b>f-value</b>	<b>p-value</b>	<b>Adjusted R Squared</b>
<b>Control Variables Only</b>	59.045	0.000**	23.900
<b>Independent and Control Variables</b>	34.597	0.000**	25.500

Table 5.20 shows the FEM with Robust Covariance Matrix Estimation results. The panel regression model of this study explains 25.50 per cent of the variance in environmental disclosure. The model is highly significant ( $p < .001$ ).

**Table 5.20 Fixed Effects Analysis Results with Robust Covariance Matrix Estimation**

<b>Variables</b>	<b>Coefficient</b>	<b>Robust Standard Error</b>	<b>t-value</b>	<b>p-value</b>
<b>Nationality</b>	-0.119	0.060	-1.978	0.024*
<b>Age</b>	-0.188	0.104	-1.805	0.036*
<b>Education</b>	-0.059	0.043	-1.361	0.087
<b>Gender</b>	0.131	0.160	0.820	0.206
<b>Company Size</b>	-0.003	0.006	-0.590	0.278
<b>Profitability</b>	-0.102	0.085	-1.192	0.117
<b>Ownership Concentration</b>	0.001	0.001	1.281	0.101
<b>Board Independence</b>	-0.014	0.055	-0.251	0.401
<b>Year</b>	0.065	0.004	18.073	0.000**
<b>No. of observations</b>				450
<b>Adjusted R squared</b>				0.255
<b>p-value</b>				0.000

Note: Associations \*\* and \* denote 0.01 and 0.05 significance level respectively. One tailed probabilities are used for the tests of the variables since the associated hypothesis are directional.

Fixed effects model relies on within (time series) variation. Hence, the effects of variables that do not change through time cannot be identified (Baltagi 2008). The fixed effect model is unable to estimate the effect of industry as it is a time-invariant variable that remain the same for the given cross-sectional unit through time from 2014 to 2016. On the other hand, year variable varies for the given cross-sectional unit through time from 2014 to 2016, thus, the variable is estimated using fixed effects model.

Table 5.20 displays that the coefficient for the proportion of foreign directors on the board and the level of environmental disclosure practices by Malaysian listed companies

is -0.119 and is negatively and statistically significant at 5 per cent level of significance ( $t=-1.978$ ,  $p=0.024$ ). This result implies that the existence of foreign directors on board decreases the level of environmental disclosure. Therefore, Hypothesis 1 is not supported. The results do not support the notion of resource dependence theory that foreign directors on board offer more input and resources such as a variety of skills, experiences, opinion, language, religion, culture, behaviour and norms that leads to the improvement of decision making of the board mainly in encouraging environmental reporting strategies. The reason could be due to the low proportion of foreign directors on board (8.70 per cent) as shown in the descriptive statistics in Section 5.3. Besides, the foreign directors may not have adequate familiarity with the environment in which the company operate in, and thus, do not show interest in socially responsible actions. The finding is consistent with the prior studies done by Majeed, Aziz, and Saleem (2015) that dictate foreign nationals on board do not influence the CSR reporting in Pakistan. In contrast, Khan (2010) and Muttakin, Khan, and Subramaniam (2015) establish a positive association between foreign directors and CSR reporting in Bangladesh. Haniffa and Cooke (2002) and Janggu et al. (2014) discover no association between foreign directors and the level of environmental disclosure in Malaysian companies.

Table 5.20 reports that the coefficient for the proportion of younger directors and the level of environmental disclosure practices by Malaysian listed companies is -0.188 and is statistically significant at 5 per cent level of significance ( $t=-1.805$ ,  $p=0.036$ ). This result indicates that the proportion of younger directors is negatively associated with the level of environmental disclosure, suggesting that the level of environmental disclosure is reduced with the existence of younger directors. Therefore, the Hypothesis 2 is not supported. The results do not support the notion of resource dependence theory that younger directors contribute a different perspective, skills and insights to the board that enhances the capability of the company in solving problems and decision. This could be due to the younger directors may not have exposed widely to the society, less mature and sensitive to the environment, thus contributing to less communication of environmental information in annual reports or stand-alone sustainability reports (Vries and Miller 1984). Besides, the negative association could be due to the low proportion of



younger directors on board (5.50 per cent) as indicated in Section 5.3. The result is consistent with Harjoto, Laksmana, and Lee (2015) and Cucari, Esposito De Falco, and Orlando (2018) that dictate board age has negative and significant effects on ESG disclosure of the listed companies in United States and Italy respectively. In contrast, Ferrero-Ferrero, Fernández-Izquierdo, and Muñoz-Torres (2015) and Ibrahim and Hanefah (2016) dictate a statistically significant positive association between young board members and CSR disclosure. Giannarakis (2014) expound that board age has no effect on the extent of CSR disclosure in United States.

The coefficient for the proportion of educated directors and the level of environmental disclosure practices by Malaysian public listed companies is -0.059 and is not statistically significant ( $t=-1.361$ ,  $p=0.087$ ). In other words, the result indicates the proportion of educated directors in the fields of business and law has no effect on the level of environmental disclosure. Therefore, Hypothesis 3 is not supported. The results do not support the notion of resource dependence theory that educated directors are highly skilled in making strategic decision making which lead to a higher capacity to recognise and acquire advantage of opportunities in order to elevate the company's value. The educated directors may perceive environmental disclosure as a cost for the company instead of a strategic opportunity (Agrawal and Knoeber 2001). Furthermore, Sánchez, Bolívar, and Hernández (2017) expound that CSR topics are not broadly exposed in the design of curricula for courses. However, the findings of previous research into this association are mixed. Post, Rahman, and Rubow (2011) document no statistically significant association between educated directors and the level of environmental disclosure; similar to the finding in this thesis. Whereas, Htay et al. (2012), Harjoto and Jo (2011), and Mohamed and Faouzi (2014) state that there is a positive association between educated directors and the level of environmental disclosure. Slater and Dixon-Fowler (2010) indicate that educated directors tend to perceive environmental disclosure as an opportunity to enhance the reputation of the company and environmental legitimacy.

Based on Table 5.20, the coefficient for the proportion of female directors and the level of environmental disclosure practices by Malaysian listed companies is 0.131 and is not

statistically significant ( $t=0.820$ ,  $p=0.206$ ). This result indicates that the level of environmental disclosure is not significantly associated with proportion of female directors. It implies that female directors may not affect the level of environmental disclosure in annual reports or sustainability reports. Therefore, Hypothesis 4 is not supported. Corporations and Markets Advisory Committee (2009) supports a more open approach to the identification and selection of directors. Australian Institute of Company Directors (AICD) suggests the idea of mandatory quota for female directors on board is a misleading principle and is difficult to cultivate such practice, besides, being tokenistic and counterproductive to the aim of enhancing board diversity (Khadem 2015). Notwithstanding this, from a resource dependence theory perspective, female directors are important resource to the companies based on their contributions in terms of bringing new ideas and their expertise to the board for decision makings (Walt and Ingley 2003). Similarly, prior studies conducted in developed countries find a positive association between female director on board and environmental disclosure (Barako and Brown 2008; Bear, Rahman and Post 2010; Bernardi and Threadgill 2011; Fernandez-Feijoo, Romero and Ruiz 2012). This thesis documents no association, which could be due to a small proportion of female directors on boards (12.00 per cent) as reported in Section 5.3. Hence, a small representation of female directors in the board is seen as less effective in influencing the board in making decisions such as the disclosure of environmental information. As suggested by Fernandez-Feijoo, Romero, and Ruiz (2012), there must be at least three female on board of directors to have significant and positive impact on sustainable and corporate governance.

The control variables in this thesis consist of company size, industry, year, profitability, ownership concentration, and board independence. Table 5.20 shows that the coefficient for company size on the level of environmental disclosure of public listed companies in Malaysia is  $-0.003$  and is not statistically significant ( $t=-0.590$ ,  $p=0.278$ ). This result suggests that company size may not affect the level of environmental disclosure. However, prior research conducted by Wang and Hussainey (2013) suggest that a positive association exists between company size and level of environmental disclosure practices.

The coefficient of the level of environmental disclosure on profitability is -0.102, and is not statistically significant ( $t=-1.192$ ,  $p=0.117$ ). This result suggests that profitability may not be a concern on the level of environmental disclosure. The result is consistent with Lu and Abeysekera (2014) where the study fails to find any relationship between profitability and environmental disclosure. However, empirical findings on profitability and environmental disclosure are mixed with some studies negative association between profitability and environmental disclosure (Neu, Warsame and Pedwell 1998) and others finding a positive relationship (Qiu, Shaukat and Tharyan 2016).

The coefficient of the level of environmental disclosure on ownership concentration is 0.001, and is not statistically significant ( $t=1.281$ ,  $p=0.101$ ). This result suggests that the level of environmental disclosure is not affected by ownership concentration. The result of this finding is consistent with Bowrin (2013).

The thesis finds that the coefficient for the level of environmental disclosure on board independence is -0.014 and is not statistically significant ( $t=0.251$ ,  $p=0.401$ ). This result suggests that board independence may not affect the level of environmental disclosure.

The thesis finds that the coefficient for the level of environmental disclosure on year is 0.065 and is statistically significant at 1 per cent level of significance ( $t=18.073$ ,  $p<.001$ ). The level of environmental disclosure is affected by the year as it reflects the actions taken by the company in adapting to different periods that the business environment experienced economic and governance changes. This result indicates that year is positively associated with the level of environmental disclosure, meaning the company has been responsive to the governance changes in improving the level of environmental disclosure. The result is consistent with Haniffa and Cooke (2005) whereby they find an increase in environmental disclosure after the Asian financial crisis in the year 1997. The companies demonstrate environmental disclosure activities in the annual reports in conjunction with the global crisis to establish a long term favourable corporate image for the companies. According to Sutantoputra (2009), the companies in

Malaysia tend to increase the environmental disclosure practices to portray a better social image to the public.

To sum it up, the independent variables, namely younger directors, foreign directors on board are statistically significant and negatively associated with the level of environmental disclosure practices of Malaysian public listed companies over the three periods. The presence of younger directors and foreign directors do not support the notion of resource dependence theory in this thesis.

### **5.9. Summary**

In this chapter, the statistics on the level of environmental disclosure practices of Malaysian public listed companies and board diversity variables are discussed. The level of environmental disclosure is low with an average of 21.40 per cent disclosed in companies' annual reports. The level of environmental disclosure shows negative and statistically significant association with younger directors, and foreign directors on board. However, this thesis finds educated directors and female directors are not statistically significant predictors of the level of environmental disclosure.

## **CHAPTER 6. ADDITIONAL ANALYSES**

### **6.1. Introduction**

The previous chapter shows the main results analysis in this thesis. Additional analyses are conducted and the results are reported in this chapter.

The order of the chapter is as follows: regression results generated from pooled OLS model and random effects model are reported in Section 6.2; the regression based on 'hard' disclosure items and 'soft' disclosure items are presented in Section 6.3 and Section 6.4 respectively; the regression re-run with the alternate measurement of age and nationality is presented in Section 6.5; and the chapter is concluded in Section 6.7.

### **6.2. Pooled OLS and Random Effects Models Results**

In order to ensure the validity and reliability of the main analysis, two other analyses, namely pooled OLS and random effects models are carried out. Table 6.1 presents the results of pooled OLS and Random Effect models. The explanatory power of both models is similar as reflected by the adjusted R-square of 43.20 per cent and 43.80 per cent respectively. Both models are significant ( $p < .001$ ) in explaining the substantial percentage of the variation in the level of environmental disclosure.

**Table 6.1 Pooled OLS and Random Effect Models Regression Results**

Variables	Pooled OLS			Random Effects Model		
	Coefficient	t-value	p-value	Coefficient	t-value	p-value
Nationality	0.001	0.022	0.482	-0.004	-0.074	0.442
Age	-0.106	-1.512	0.001*	-0.137	-1.591	0.001*
Education	0.039	0.975	0.026*	0.030	0.614	0.110
Gender	0.013	0.191	0.351	0.039	0.491	0.163
Company Size	0.021	4.566	0.000*	0.016	2.974	0.000*
Profitability	0.098	1.006	0.022*	0.064	0.563	0.130
Ownership Concentration	0.001	1.313	0.004*	0.001	1.132	0.012*
Board Independence	-0.027	-0.436	0.192	-0.026	-0.370	0.230
Year	0.065	6.759	0.000*	0.065	8.218	0.000*
No. of Observations			450			450
Adjusted R Squared			0.432			0.438
F-Statistic			35.083			35.982
p-value			0.000**			0.000**

Note: Associations \*\* and \* denote 0.01 and 0.05 significance level respectively. One tailed probabilities are used for the tests of the variables since the associated hypothesis are directional.

Table 6.1 shows that the coefficients for the proportion of foreign directors on the board and the level of environmental disclosure practices by Malaysian listed companies in pooled OLS and random effects model are 0.001 and -0.004 respectively and are not statistically significant ( $t=0.022$ ,  $p=0.482$ );( $t=-0.074$ ,  $p=0.442$ ). In other words, the results indicate the proportion of foreign directors has no effect on the level of environmental disclosure. The result is consistent with the prior studies done by Haniffa and Cooke (2002) where they report insignificant association between the level of environmental disclosure and foreign directors.

The coefficients for the proportion of younger directors and the level of environmental disclosure practices by Malaysian listed companies in both pooled OLS and random effects models, as reported in Table 6.1, are -0.106 -0.137 respectively and are statistically significant at 1 per cent level of significance ( $t=-1.512$ ,  $p=0.001$ ). These results indicate that the proportion of younger directors is negatively associated with the level of environmental disclosure, implying that having younger directors in the board will not contribute to greater level of environmental disclosure. The result obtained is similar to Section 5.8. Furthermore, the result is consistent with Harjoto, Laksmana, and Lee (2015) whereby a negative association between younger directors on board and the level of environmental disclosure is identified. In contrast, prior literature by Post, Rahman, and Rubow (2011) state a positive association between younger directors and the level of environmental disclosures.

The coefficient for the proportion of educated directors and the level of environmental disclosure practices by Malaysian public listed companies in pooled OLS is 0.039 and is statistically significant at 5 per cent level of significance ( $t=0.975$ ,  $p=0.026$ ). This result indicates that the proportion of educated directors is positively associated with the level of environmental disclosure, suggesting that the greater number of directors with business and law qualification could increase the level of environmental disclosure. The result is consistent with Htay et al. (2012), Harjoto and Jo (2011), and Mohamed and Faouzi (2014). According to resource dependence theory, educated directors are more apt and resourceful in making strategic decision making which lead to a higher capacity

to recognise and acquire advantage of opportunities in order to elevate the company's value (Geletkanycz and Black 2001). Slater and Dixon-Fowler (2010) relate that educated directors tend to perceive environmental disclosure as an opportunity to enhance the reputation of the company and environmental legitimacy. Notwithstanding this, Table 6.1 displays that the educated directors have no influence on the level of environmental disclosure practices under the random effects model.

The coefficients of the proportion of female directors and the level of environmental disclosure practices by Malaysian listed companies in both pooled OLS and random effects models are 0.013 and 0.039 and are not statistically significant ( $t=0.191$ ,  $p=0.351$ ); ( $t=0.491$ ,  $p=0.163$ ). This result indicates that the level of environmental disclosure is not significantly associated with proportion of female directors. This result is similar to the results in Section 5.8 and the results obtained from prior research done by Said, Omar, and Abdullah (2013).

The control variables in this thesis consist of company size, industry, year, profitability, ownership concentration, and board independence. Table 6.1 shows the coefficients for company size on the level of environmental disclosure of public listed companies in Malaysia in both pooled OLS and random effects models are 0.021 and 0.016, and are statistically significant at 1 per cent level of significance ( $t=4.566$ ,  $p<.001$ ); ( $t=2.974$ ,  $p<.001$ ). These results indicate that company size is positively associated with the level of environmental disclosure, meaning that the level of environmental disclosure increases with the company size. This is consistent with the research conducted by Wang and Hussainey (2013) that suggests a positive association between company size and level of environmental disclosure practices.

The coefficient of the level of environmental disclosure on profitability in pooled OLS is 0.098, and is statistically significant at 5 per cent level of significance ( $t=1.006$ ,  $p=0.022$ ). This result implies that the level of environmental disclosure is positively associated with profitability. This shows that an increase in profitability increases the level of environmental disclosure. Positive association between profitability and the



level of environmental disclosure is found in eco-friendly investment where there is an implicit financial expenditure. The results of this finding are consistent with Qiu, Shaukat, and Tharyan (2016) where the study states that there is a positive association between profitability and environmental disclosure. However, empirical findings on profitability and environmental disclosure are mixed with some studies do not find any association between profitability and environmental disclosure (Lu and Abeysekera 2014) and others record a negative association (Neu, Warsame and Pedwell 1998).

Notwithstanding this, the coefficient of the level of environmental disclosure on profitability in random effects model is 0.064, and is not statistically significant ( $t=0.563$ ,  $p=0.130$ ). This result suggests that profitability may not be a concern on the level of environmental disclosure. Similarly, the results are consistent with Section 5.8 and the study done by Lu and Abeysekera (2014).

The coefficients of the level of environmental disclosure on ownership concentration in pooled OLS and random effects model are 0.001, and are statistically significant at 1 per cent level of significance ( $t=1.313$ ,  $p=0.004$ ); ( $t=1.132$ ,  $p=0.012$ ). This result indicates that ownership concentration is positively associated with the level of environmental disclosure, meaning that the level of environmental disclosure increases with the ownership concentration. The results of this finding is consistent with the study done by Abdullah, Mohamed, and Mokhtar (2011) whereby the companies with higher ownership concentration tend provide more information disclosure in order to satisfy the requirements of majority shareholders on CSR reporting.

Table 6.1 finds that the coefficients for the level of environmental disclosure on board independence in pooled OLS and random effects model are -0.027 and -0.026 and are not statistically significant ( $t=-0.436$ ,  $p=0.192$ ); ( $t=-0.370$ ,  $p=0.230$ ). This result suggests that board independence may not affect the level of environmental disclosure. This is similar with the results obtained in Section 5.8.

Table 6.1 finds that the coefficients for the level of environmental disclosure on year in pooled OLS and random effects model are 0.065 and are statistically significant at 1 per cent level of significance ( $t=6.759$ ,  $p<.001$ ); ( $t=8.218$ ,  $p<.001$ ). This result indicates that year is positively associated with the level of environmental disclosure, meaning that the level of environmental disclosure increases with the year. This is similar with the results obtained in Section 5.8.

Table 6.2 displays a summary of the results across three models. Age and gender are reported as having consistent results across three estimators. Education is not a significant predictor in fixed effect and random effect estimators. Nationality is statistically significant although not in the intended directionality, it is reported as not a significant predictor in pooled OLS and random effect estimators. By and large, results are robust across the three estimators to a greater extent.

**Table 6.2 Summary of Regression Results**

	<b>Regression Hypotheses</b>	<b>Fixed Effect Model</b>	<b>Pooled OLS Model</b>	<b>Random Effect Model</b>
<b>Nationality</b>	Hypothesis 1	NAD	NS	NS
<b>Age</b>	Hypothesis 2	NAD	NAD	NAD
<b>Education</b>	Hypothesis 3	NS	SS	NS
<b>Gender</b>	Hypothesis 4	NS	NS	NS

Legend: NAD = not accepted directionality (statistically significant but in opposite direction to that hypothesized), NS = not significant, SS = statistically significant.

### 6.3. Regression Results Based Hard Disclosure Items

Table 6.3 reports the results of ‘hard’ environmental disclosure items. The explanatory power of the model is reflected by the adjusted R-square of 28.40 per cent. The model is highly significant ( $p < .001$ ) in explaining a substantial percentage of the variation in the level of environmental disclosure.

**Table 6.3 Fixed Effects Analysis Results with Robust Covariance Matrix Estimation (‘Hard’ Disclosure Items)**

<b>Variables</b>	<b>Coefficient</b>	<b>Robust Standard Error</b>	<b>t-value</b>	<b>p-value</b>
<b>Nationality</b>	-0.048	0.076	-0.631	0.264
<b>Age</b>	-0.147	0.126	-1.168	0.122
<b>Education</b>	-0.084	0.049	-1.719	0.043*
<b>Gender</b>	0.124	0.152	0.814	0.208
<b>Company Size</b>	-0.003	0.006	-0.580	0.281
<b>Profitability</b>	-0.137	0.092	-1.482	0.070
<b>Ownership Concentration</b>	0.001	0.001	1.153	0.125
<b>Board Independence</b>	-0.014	0.061	-0.236	0.407
<b>Year</b>	0.043	0.004	10.500	0.000**
<b>No. of observations</b>				450
<b>Adjusted R squared</b>				0.284
<b>F-Statistic</b>				12.842
<b>p-value</b>				0.000**

Note: Associations \*\* and \* denote 0.01 and 0.05 significance level respectively. One tailed probabilities are used for the tests of the variables since the associated hypothesis are directional.

The coefficient for the proportion of educated directors and the level of disclosure of ‘hard’ environmental information by Malaysian public listed companies is -0.084 and is statistically significant at 5 per cent level of significance ( $t = -1.719$ ,  $p = 0.043$ ). This result indicates that the proportion of educated directors is negatively associated with the level of ‘hard’ environmental disclosure. Despite having more educated directors on board, there is little disclosure of information relating governance structure and management system; credibility by way of GRI sustainability reporting adoption, certification, assurance; environmental performance indicators and expenditure.

Female directors; younger directors and foreign directors are not statistically and significantly associated with the level of ‘hard’ environmental disclosure.

None of the control variables can influence the level of ‘hard’ environmental disclosure. Again, the dummy variable, Year is statistically significant at 1 per cent level of significance ( $t=10.500$ ,  $p<.001$ ). The level of ‘hard’ environmental disclosure demonstrates a significant increase over the three-year period.

#### 6.4. Regression Results Based on Soft Disclosure Items

Table 6.4 shows the Fixed Effects results for ‘soft’ disclosure items. The explanatory power of the model is reflected by the adjusted R-square of 61.70 per cent. The model is highly significant ( $p<.001$ ) in explaining the substantial percentage of the variation in the level of environmental disclosure.

**Table 6.4 Fixed Effects Analysis Results with Robust Covariance Matrix Estimation (Soft Disclosure Items)**

<b>Variables</b>	<b>Coefficient</b>	<b>Robust Standard Error</b>	<b>t-value</b>	<b>p-value</b>
<b>Nationality</b>	-0.255	0.083	-3.065	0.001**
<b>Age</b>	-0.282	0.118	-2.386	0.009**
<b>Education</b>	0.000	0.056	0.004	0.498
<b>Gender</b>	0.144	0.148	0.975	0.165
<b>Company Size</b>	-0.004	0.006	-0.583	0.280
<b>Profitability</b>	-0.090	0.134	-0.670	0.252
<b>Ownership Concentration</b>	0.001	0.001	0.441	0.330
<b>Board Independence</b>	0.005	0.067	0.071	0.472
<b>Year</b>	0.105	0.005	21.578	0.000**
<b>No. of observations</b>				450
<b>Adjusted R squared</b>				0.617
<b>F-Statistic</b>				52.096
<b>p-value</b>				0.000**

Note: Associations \*\* and \* denote 0.01 and 0.05 significance level respectively. One tailed probabilities are used for the tests of the variables since the associated hypothesis are directional.

Both foreign directors (Nationality) and younger directors (Age) are statistically significant at 1 per cent and 5 per cent levels of significance respectively. Both variables

are negatively associated with the level of ‘soft’ environmental disclosures. The results imply that foreign directors and younger directors on board do not influence the management to disclose more of ‘soft’ environmental information pertaining to vision and strategy and environmental profile of the company.

Female directors and educated directors are not statistically significant to the level of ‘soft’ environmental disclosure. While none of the control variables is associated with the level of ‘soft’ environmental disclosure.

### **6.5. Robustness Check (Age and Nationality)**

The main analysis reported in Chapter Five and sub-analyses done in preceding sections demonstrate that Age (determined by the proportion of younger directors) and Nationality (measured by the proportion of foreign directors) are statistically significant and negatively associated with the level of environmental disclosure. Conversely, the additional analysis is undertaken where Age is measured as the proportion of older directors who are above 40 years old whilst Nationality as the proportion of local directors; and run it using Fixed Effect Model with Robust Covariance Matrix Estimation.

Table 6.5 depicts the results of regression. The explanatory power of the model is reflected by the adjusted R-square of 51.70 per cent. The model is highly significant ( $p < .001$ ) in explaining a substantial percentage of the variation in the level of environmental disclosure.

**Table 6.5 Fixed Effects Analysis Results with Robust Covariance Matrix Estimation (Older Directors and Local Directors)**

<b>Variables</b>	<b>Coefficient</b>	<b>Robust Standard Error</b>	<b>t-value</b>	<b>p-value</b>
<b>Nationality</b>	0.119	0.060	1.978	0.024*
<b>Age</b>	0.188	0.104	1.805	0.036*
<b>Education</b>	-0.059	0.043	-1.361	0.087
<b>Gender</b>	0.131	0.160	0.820	0.206
<b>Company Size</b>	-0.003	0.006	-0.590	0.278
<b>Profitability</b>	-0.102	0.085	-1.192	0.117
<b>Ownership Concentration</b>	0.001	0.001	1.281	0.101
<b>Board Independence</b>	-0.014	0.055	-0.251	0.401
<b>Year</b>	0.065	0.004	18.073	0.000**
<b>No. of observations</b>				450
<b>Adjusted R squared</b>				0.517
<b>F-Statistic</b>				34.597
<b>p-value</b>				0.000**

Note: Associations \*\* and \* denote 0.01 and 0.05 significance level respectively. One tailed probabilities are used for the tests of the variables since the associated hypothesis are directional.

Table 6.5 shows that the coefficient for the proportion of older directors and the level of environmental disclosure practices by Malaysian listed companies is 0.188 and is statistically significant at 5 per cent level of significance ( $t=1.805$ ,  $p=0.036$ ). This result indicates that the proportion of older directors is positively associated with the level of environmental disclosure, meaning that the older directors in the board can enhance the disclosure of environmental information. This result substantiates the result reported in Section 5.8 whereby the proportion of younger directors and the level of environmental disclosure practices by Malaysian listed companies is found to have negative and statistically significant level of significance. This could be attributed to older directors who may be more sensitive to how the business operations could do to the environment, and be more accountable and transparent in communicating the environmental information via annual reports or stand-alone sustainability reports. As the older directors may have more knowledge in the environmental policies and sustainability reporting framework, they are likely more effective in monitoring the companies and ensuring environmental legitimacy through the environmental disclosure practice

(Sánchez, Bolívar and Hernández 2017; Murias, de Miguel and Rodríguez 2008; Gallego-Alvarez, Rodríguez-Domínguez and García-Sánchez 2011; Hillman and Dalziel 2003). Hence, the environmental disclosure information appears to be associated with the age of directors, with older directors tends to disclose more information than the younger directors

The proportion of local directors on the board and the level of environmental disclosure practices by Malaysian listed companies is 0.119 and is statistically significant at 5 per cent level of significance ( $t=1.978$ ,  $p=0.024$ ). This result implies that the level of environmental disclosure is positively associated with the proportion of local directors on board, meaning that the local directors on board increase the level of environmental disclosure. This result substantiate the findings in Section 5.8 whereby, the result show that the proportion of foreign directors on board and the level of environmental disclosure practices by Malaysian listed companies is negative and statistically significant.

The results may suggest that the boards of directors of public listed companies may not be ready to diversify the board by including more younger and foreign directors on board.

## **6.6. Summary**

Additional analyses are carried out to get further insight of the main results in Section 5.8. First, pooled OLS and random effects models are carried out and the results show that younger directors on board are significantly negatively associated with the level of environmental disclosure practices. The results are consistent with the main analysis in Section 5.8.

Second, the regression is re-estimated based on ‘hard’ disclosure items and the results obtained show educated directors on board is a significant negative predictor of the level of ‘hard’ environmental information disclosed. Whereas, the regression based on ‘soft’ disclosure items shows the younger directors and foreign directors on board are

significant negative estimates of such information disclosed by the Malaysian public listed companies.

Lastly, the regression is conducted with the same model but the proportion of younger directors and foreign directors are replaced with the proportion of older directors and local directors respectively. The results are consistent with the reported results earlier in Section 5.8 whereby the independent variables mainly, older directors and local directors on board are significant positive estimates of the level of environmental disclosure practices of Malaysian public listed companies.



## **CHAPTER 7. CONCLUSIONS**

### **7.1. Introduction**

This chapter draws the conclusions of the thesis which examines Malaysian environmental disclosure practices from 2014 till 2016. The chapter is organised as follows. Section 7.2 shows the research objectives and research questions of the thesis. Section 7.3 discusses the implications drawn from the results. Also, Section 7.4 outlines the assumptions used and identifies the limitation of this thesis. Section 7.5 discusses the recommendations for future research and contributions of the thesis are indicated in Section 7.6. Lastly, Section 7.7 concludes this chapter.

### **7.2. Summary of the Thesis**

#### **7.2.1. Research Objectives**

The aim of this thesis is to investigate the impact of board diversity on the level of corporate environmental disclosure of Malaysia public listed companies. This thesis has three research objectives as follows:

1. to identify the types of environmental information disclosed in the annual reports of Malaysian listed companies;
2. to determine the level of environmental disclosures; and
3. to examine the determinants influencing the level of environmental disclosure

#### **7.2.2. Summary of Research Findings**

Corporate board diversity and environmental disclosure are two major issues concerning the governance and accountability to wide array of stakeholders. In regards to the first research question, the thesis determines the types of environmental information disclosed in annual reports of Malaysian public listed companies. For the purpose of this thesis, the level of environmental disclosures practices is measured by using EDI that are categorised into ‘hard’ and ‘soft’ disclosure items. The descriptive statistics of ‘hard’ and ‘soft’ EDIs in Chapter 5 highlights the mean ‘soft’ EDI of 36.20 per cent is higher than the mean ‘hard’ EDI of 13.30 per cent. The result shows that the samples companies disclose more ‘soft’ environmental information, instead of ‘hard’

information. Furthermore, the 'soft' disclosure scores ratios are 63.36 per cent, 55.04 per cent, and 59.64 per cent in years 2014, 2015, and 2016 respectively. Conversely, the 'hard' disclosure scores ratios are 36.64 per cent, 44.97 per cent, and 40.37 per cent in years 2014, 2015, and 2016 respectively. The results show that the companies in Malaysia disclose environmental information that is mainly 'soft' in nature, where A5 – "Vision and strategy claims" shows the highest percentage of 'soft' disclosure information disclosed (50.29 per cent) over the three-year study period. Hence, in response to Research Question 1, the environmental information disclosed in annual reports of Malaysian public listed companies are more inclined to 'soft' disclosure items mainly in the category of vision and strategy claims (A5).

In response to the second research question, the thesis identifies the level of environmental disclosure by Malaysian listed companies from years 2014 to 2016. The average level of environmental disclosure is about 21.40 per cent, which reflects that the companies in Malaysia disclose about 9 out of 45 items in the environmental disclosure instrument used in this thesis. The result shows an improved disclosure of environmental information compared to the previous studies conducted. Additionally, One-Way Repeated-Measures ANOVA is conducted to study the statistical significance of differences between the means of the EDI over the study periods, as reported in Chapter 5. There is a statistically significant increase in the level of the environmental disclosure over the three-year study period. The increase in means EDI is statistically significant at the 1% level ( $p < .001$ ). The overarching research proposition developed in Chapter 3 is supported by the findings, as the differences in means of EDI are statistically significant at the 1% level.

Board diversity is considered an important aspect in decision-making process. In response to the third research question, the findings of this thesis show that younger directors and foreign directors on board are negatively associated with the level of environmental disclosure. The findings do not support resource dependence theory that state an organisation's external environment affects its survival and growth where diverse boards are crucial to achieve the boards' many functions. The variation of

combined attributes, skills, expertise and qualification of directors are vital importance for decision-making. The findings do not support that board diversity contributes the required resources to improve board effectiveness in stakeholder management and encourage the adoption of sustainability actions.

In the context of Malaysia, younger directors and foreign directors may not have adequate local knowledge and familiarity with the environment in which the company operate. Moreover, the small representation of these groups of directors does not reach critical mass to influence the board in making decisions to disclosure environmental information. Corporate disclosure and board diversity are essential elements of a robust corporate governance framework. A company's corporate governance framework is necessary in ensuring the credibility of information disclosed. However, this thesis shows that board diversity is not yet to improve company's communication of environmental information. Instead, the assertion of Luo, Lan, and Tang (2012) that the management is pleased with total discretion over what to report on environmental issues is evident in this thesis.

### **7.3. Implications**

The findings from this thesis are important for the advancement of the stock of knowledge on environmental disclosure, and in providing both theoretical and practical implications.

Disclosure is critical to the functioning of efficient capital market (Healy and Palepu 2001). A detailed and structured system of disclosure enables stakeholders to understand, and obtain accurate and reliable information of companies in order to make better decisions. In the context of Malaysia, companies are required to disclose environmental information as part of the sustainability reporting but the environmental disclosure activity is discretionary. Malaysian companies have the choice of the amount, quality and level of environmental information disclosed in annual reports of stand-alone sustainability reports. Conducting environmental disclosure study in this 'semi-discretionary' regime gives further insight into the corporate social responsibility practice of the companies.

### **7.3.1. Theoretical Implications**

Prior studies discuss two types of capital that companies could draw upon: (i) the human capital such as expertise, experience, knowledge, reputation, and skills; and (ii) the relational capital, for instance, the potential resources derived from network of relationships possessed by the directors (Becker 1964; Coleman 1988; Nahapiet and Ghoshal 2000). Hence, board diversity facilitates the understanding of the board's provision of resources in terms of human capital and relational capital and their effects on corporate environmental disclosure.

One of the important functions of the board is the provision of resources. This function refers to the ability of the board to bring resources to the company, whereby resources being anything that could be thought of as a strength or weakness of a given company (Wernerfelt 1984). The theoretical underpinning this board function is based on resource dependence theory which is developed by Pfeffer (1972). Goodstein, Gautam, and Boeker (1994) state resource dependence theory encourages the company to draw upon the board for crucial resources mainly expertise and guidance in strategic change. Hence, the key to organisation survival is through acquiring and maintaining resources.

This thesis develops the proposition of board diversity in influencing the corporate environmental disclosure. Based on the typology of board diversity comprising nationality, age, education, and gender; this thesis facilitates the exploration of the types of resources, and their effects on corporate environmental disclosure.

According to Landry, Bernardi, and Bosco (2016), the inclusion of diversity in a corporate board brings different outlook and insights to the board. This thesis finds that younger directors and foreign directors on board are negatively associated with the level of environmental disclosure. The findings are contrary to resource dependence theory that asserts that an organisation's external environment affects its performance where diverse boards are necessary to fulfil the board's many functions. The integration of the various skills, expertise and qualifications of directors are crucial for decision-making. The results do not suggest that board diversity brings the required resources to enhance

board effectiveness in stakeholder management and promote the adoption of sustainability initiatives. A relatively small proportion of young directors and foreign directors cannot represent diversity in the boardroom to influence environmental disclosure decision. Board diversity needs to be analysed with more detail, beyond the basic typology that is employed in this thesis. Board diversity is not homogeneous in terms of demographic background and effects on how board perform their tasks including the corporate disclosure in annual reports decision. Corporate disclosure and board diversity are important elements in corporate governance. Innovation has become the new currency of success in the rapidly evolving digital age. Companies must embrace to human factor. A company's ability to innovate is related to the diversity of the people. As a consequence, the effect of board diversity needs to be analysed on a more refined ground.

### **7.3.2. Practical Implications**

The findings of this thesis have several practical implications for the companies, policy makers, regulators and investors. The findings shed light on the corporate governance issues in Malaysian listed companies. From a company perspective, the findings will be of interest to the board of directors, especially the nomination committee which is entrusted to oversee the selection and assessment of directors (Securities Commission Malaysia 2012). The findings will serve as a point of reference to the nomination committee in assessing the make-up and suitability of candidates as board members.

Despite the Malaysian government setting a quota of 30.00 per cent of female representation by year 2016 (Securities Commission Malaysia 2011), the average of female directors on board in sample companies is only 12.00 per cent. Further, gender diversity is not a significant predictor in improving environmental disclosure. This could be due to the small female representation on board which render them less effective in influencing the decision making of the board. Fernandez-Feijoo, Romero, and Ruiz (2012) expound that there must be at least three female on board of directors to ensure significant and positive impact on sustainable and corporate governance. Likewise, a board comprising directors of diverse human and relational capital enables a company to

draw resources upon to drive sustainability agenda. Hence, the nomination committee of board should establish a policy formalising its approach to boardroom diversity.

From a public policy perspective, the findings of this thesis are of interest policy makers. Securities Commissions Malaysia introduced gender diversity by year 2016 but the sample companies record a low representation of female in board of directors. Nonetheless, the policy maker should continue advocating and enforcing board diversity to enhance corporate disclosure transparency with regard to environmental performance and input. Unless Malaysian boardrooms include a good mix of directors, board diversity is unlikely to enhance board strategic decisions.

The findings from this thesis serve as a point of reference on the type of environmental information disclosed in the annual reports to green investors under the Green Technology Financial Scheme (GTFS). The GTFS, administered by GreenTech Malaysia, has been instrumental in encouraging the participation of private financial institutions to invest in green technology sectors, as it has brought together a total of 28 banks and financial institutions to participate in the scheme (GreenTech Malaysia 2018). With the growing number of companies that report environmental information, investors seek assurance that sustainability risks have been managed through external assurance of sustainability reports. Though assurance is not mandatory for sustainability reports, credibility is of vital importance for risk management. One of the categories under 'hard' disclosure in the EDI used in this thesis is 'credibility' whereby independent assurance about environmental information disclosed in annual reports or stand-alone sustainability reports is measured. The EDI in this thesis provides an in depth analysis on the total disclosure and hence, providing the investors with more information on the companies' seriousness and reliability in reporting environmental disclosure as the investors prefer to invest in transparent companies.

#### **7.4. Assumptions and Limitations**

This thesis acknowledges several assumptions and limitations.

#### **7.4.1. Assumptions**

Firstly, annual reports or stand-alone sustainability reports are used as the main sources for environmental disclosure measurement and data collection. Burgwal and Vieira (2014) indicate the appropriateness of the use of annual reports and sustainability reports in environmental disclosure studies. Hence, both sustainability reports and annual reports of sample companies are used due to their credibility, accessibility and availability (Adams, Hill and Roberts 1998).

Secondly, this thesis assumes the items listed in the environmental disclosure scorecard represent the general environmental initiative of Malaysian listed companies as a whole. In addition, the thesis assumes that the 45-item environmental disclosure scorecard is applicable to all listed companies in the sample frame.

Thirdly, the thesis highlights the year 2014 to year 2016. The selection of the years 2014 to 2016 is on the back of the revision of Malaysian Code on Corporate Governance in 2012 which focuses on encouraging companies in Malaysia to put in place corporate disclosure policies that demonstrate principles of good disclosure. It is appropriate to examine the companies' disclosure practices for the periods after the introduction of MCCG 2012 as it would reflect the actions taken by the companies, which are highly relevant for this thesis in achieving its research objectives. Year 2016 represents the latest year for which annual reports are available for data collection at the time of the commencement of this research.

#### **7.4.2. Limitations**

This thesis has several limitations. First, this thesis examines four of the diversity characteristics, mainly age, gender, nationality and education. As Malaysia is a multiracial country that provides an interesting ground of research due to the diverse ethnicity and races, by selecting four attributes of diversity, this may limit the insight of board diversity in explaining the communication of environmental information.

This thesis only covers three years which is year 2014 to year 2016, thus may not be generalizable to other periods. This limited period allows only very specific conclusions

that are limited by the context. For instance, the selection of years limits the view of environmental disclosure reporting before the implementation of Bursa Malaysia CSR guideline and the inclusion of board diversity on board.

Also, the thesis only uses annual reports or stand-alone sustainability reports as the main sources for environmental disclosure measurement and data collection. The data collected is subjected to the items disclosed in these reports. The data collected excludes the environmental information that may be communicated in other reporting mediums such as website and press release.

This thesis analyses the environmental disclosure determinants in Malaysia and enlightens the policy makers and potential investors on the recent environmental reporting in Malaysia. However, this thesis focuses only on one country, Malaysia. The institutional framework and techniques of environmental disclosure might not be applicable to other countries in the region. The findings may not be applicable to other South East Asian countries or other developing countries.

This thesis focuses on the company listed in Bursa Malaysia where the annual report or stand-alone sustainability reports are easily available from the website of Bursa Malaysia. It limits the generalizability of the results to non-listed companies.

Lastly, this thesis studies the association of board diversity with the level of environmental disclosure, framed by resource dependence theory. This thesis only focuses on part of the board function, which is the provision of resources of the board. The monitoring function of the board is not looked at in this thesis, thus the findings are not holistic in that regard.

### **7.5. Recommendations for Future Research**

As board diversity is gradually getting attention from the public, future research can consider analysing the impact of ethnicity on the level of environmental disclosure practices. This will enhance the understanding of the policy makers and investors especially in the context of Malaysia.



This thesis encompasses a timeframe of three periods from 2014 till 2016. Future research could extend the study by increasing the time horizon to evaluate the new MCCG 2017 impact within the Malaysian context. In addition, a comparative study with companies listed on the stock exchanges of different countries could be undertaken. This may provide useful insights in environmental disclosure practices from a regional perspective.

As other medium of reporting such as media and websites show another viewpoint of the company, future studies can include media and websites as another source of information besides annual reports or the stand-alone sustainability reports. Furthermore, future studies could be extended by using a survey or interviews in order to deepen the understanding of the diversity variables that influence the level of environmental disclosure.

As the board has two important functions mainly, monitoring and provision of resources, future studies can integrate agency theory and resource dependence theory in overcoming the current myopia within the two streams of research. Integrating these two theories contributes to a complete understanding of what boards do and how they affect the environmental disclosure.

#### **7.6. Thesis Contributions**

This thesis is crucial for the advancement of environmental disclosure literature. The findings of this thesis provide valuable insights on the environmental disclosure and corporate board diversity. As the companies in Malaysia have the discretion of disclosing environmental information, the findings of this thesis highlight the state of environmental disclosure in the current 'semi-discretionary' regime.

This thesis also goes beyond the traditional focus on a single diversity variable but dwells into the study of collective diversity variables that affect the level of environmental disclosure. Most of the previous studies focus on gender diversity (Barako and Brown 2008; Bear, Rahman and Post 2010; Fernandez-Feijoo, Romero and

Ruiz 2012; Bernardi and Threadgill 2011), but very few studies consider diversity as a whole. The empirical work of this thesis identifies the diversity attributes that affect the level of environmental disclosure.

The results from this thesis contribute to the existing environmental disclosure literature by focusing on discretionary environmental information and by assessing the level of environmental information disclosed. Instead of analysing the presence or absence of environmental information or studies the quantity of the disclosed environmental information by counting the number of words, sentences or pages in the annual reports, this research evaluates the 'type' of environmental information disclosed by using the environmental disclosure index developed by Clarkson et al. (2008) based on Global Reporting Initiative sustainability reporting guidelines. The variables influencing the level of environmental disclosure are examined through content analysis technique. The findings reveal the companies' true environmental commitment and related environmental exposures.

### **7.7. Thesis Conclusion**

This 3-year period examination of the level of environmental disclosure has enhanced the understanding and knowledge of the Malaysian companies' disclosure patterns. The overall results indicate a low level of environmental disclosure in Malaysian public listed companies. Notwithstanding this, the informative environment that can facilitate decision making of investors and stakeholders could be enhanced through the appropriate implementation of in sustainability reporting framework.

With the increasing environmental concern globally, a sound corporate governance structure is essential to ensure the transparency and accountability of companies. Despite the limitations outlined above, this research contributes to the debate by providing empirical evidence to Malaysian policy makers on the explanatory factors for Malaysian companies to engage in transparency and effective corporate governance. It also highlights the need for continued research for better insights into board diversity and environmental disclosure practices of Malaysian companies.

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*Thank you.*

## **APPENDIX A: Corporate Environmental Disclosure Index**

The index assessing the level of disclosures on the environmental policies, performances and inputs are shown below:

### **'Hard' Disclosure Items**

#### **(A1) Governance structure and managements systems (maximum score is 6)**

1. Existence of a department for pollution control and/or management positions for environmental managements (0-1)
2. Existence of an environmental and/or public issues committee in the board (0-1)
3. Existence of terms and conditions applicable to suppliers and/or customers regarding environmental practices (0-1)
4. Stakeholder involvement in setting corporate environmental policies (0-1)
5. Implementation of ISO14001 at the plant and/or firm level (0-1)
6. Executive compensation is linked to environmental performance (0-1)

#### **(A2) Credibility (maximum score is 10)**

1. Adopting of GRI sustainability reporting guidelines or provisions of a CERES report (0-1)
2. Independent verification/assurance about environmental information disclosed in the EP report/web (0-1)
3. Periodic independent verifications/audits on environmental performance and/or systems (0-1)
4. Certification of environmental programs by independent agencies (0-1)
5. Product certification with respect to environmental impact (0-1)
6. External environmental performance awards and/or inclusion in a sustainability index (0-1)
7. Stakeholders involvement in the environmental disclosure process (0-1)
8. Participation in voluntary environmental initiatives endorsed by EPA or Department of Energy (0-1)
9. Participation in industry specific associations/initiatives to improve environmental practices (0-1)

10. Participation in other environmental organisations/assoc. to improve, environmental practices (if not awarded under 8 or 9 above) (0-1)

**(A3) Environmental performance indicators (EPI) (maximum score is 10)**

1. 1. EPI on energy use and/or energy efficiency (0-1)
2. 2. EPI on water use and/or water use efficiency (0-1)
3. 3. EPI on greenhouse gas emissions (0-1)
4. 4. EPI on other air emissions) (0-1)
5. 5. EPI on TRI4 (land, water, air) (0-1)
6. 6. EPI on other discharges, releases and/or spills (not TRI) (0-1)
7. 7. EPI on waste generation and/or management (recycling, re-use, reducing, treatment and disposal) (0-1)
8. 8. EPI on land and resources use, biodiversity and conservation (0-1)
9. 9. EPI on environmental impacts of products and services (0-1)
10. 10. EPI on compliance performance (e.g. exceedances, reportable incidents) (0-1)

**(A4) Environmental spending (maximum score is 3)**

1. Summary of dollar savings arising from environment initiatives to the company (0-1)
2. Amount spent on technologies, R&D and/or innovations to enhance environmental performance and/or efficiency (0-1)
3. Amount spent on fines related to environmental issues (0-1)

**'Soft' disclosure items**

**(A5) Vision and strategy claims (maximum score is 6)**

1. CEO statements on environmental performance in letter to shareholders and/or stakeholders (0-1)
2. A statement of corporate environmental policy, values and principles, environ codes of conduct (0-1)
3. A statement about formal management systems regarding environmental risk and performance (0-1)
4. A statement that the firm undertakes periodic reviews and evaluations of its environmental performance (0-1)

5. A statement of measureable goals in terms of future environmental performance (if not awarded under A3) (0-1)
6. A statement about specific environmental innovations and/or new technologies (0-1)

**(A6) Environmental profile (maximum score is 4)**

1. A statement about the firms' compliance (or lack thereof) with specific environmental standards (0-1)
2. An overview of environmental impact of the industry (0-1)
3. An overview of how the business operations and/or products and services impact the environment (0-1)
4. An overview of corporate environmental performance relative to industry peers (0-1)

**(A7) Environmental initiatives (maximum score is 6)**

1. A substantive description of employee training in environmental management and operations (0-1)
2. Existence of response plans in case of environmental accidents (0-1)
3. Internal environmental awards (0-1)
4. Internal environmental audits (0-1)
5. Internal certification of environmental programs (0-1)
6. Community involvement and/or donations related to environment (if not awarded under A1,4 or A2,7) (0-1)

## **APPENDIX B: List of Sample Companies**

The list below shows the 150 sample companies listed on Bursa Malaysia stock exchange. These companies are chosen when the condition of the companies is fulfilled as stated earlier in Section 4.2.2. This sample of 150 companies represents 19.28% of the total population of companies listed in Bursa Malaysia.

### **PLANTATIONS**

- 1** ASTRAL ASIA BERHAD
- 2** BATU KAWAN BERHAD
- 3** FAR EAST HOLDINGS BERHAD
- 4** FELDA GLOBAL VENTURES HOLDINGS BERHAD
- 5** GOLDEN LAND BERHAD
- 6** MHC PLANTATIONS BHD
- 7** PLS PLANTATIONS BERHAD
- 8** UNITED PLANTATIONS BERHAD

### **CONSUMER PRODUCTS**

- 9** AJINOMOTO (MALAYSIA) BERHAD
- 10** APOLLO FOOD HOLDINGS BERHAD
- 11** ASIA FILE CORPORATION BHD
- 12** BONIA CORPORATION BERHAD
- 13** CAELY HOLDINGS BHD
- 14** COCOALAND HOLDINGS BERHAD
- 15** DUTCH LADY MILK INDUSTRIES BERHAD
- 16** EUROSPAN HOLDINGS BERHAD
- 17** FRASER & NEAVE HOLDINGS BHD
- 18** GUAN CHONG BERHAD
- 19** HONG LEONG INDUSTRIES BERHAD
- 20** HUP SENG INDUSTRIES BERHAD

- 21 HWA TAI INDUSTRIES BERHAD
- 22 IQ GROUP HOLDINGS BERHAD
- 23 K-STAR SPORTS LIMITED
- 24 KHEE SAN BERHAD
- 25 LII HEN INDUSTRIES BHD.
- 26 LONDON BISCUITS BERHAD
- 27 LTKM BERHAD
- 28 MINTYE BERHAD
- 29 NEW HOONG FATT HOLDINGS BERHAD
- 30 NTPM HOLDINGS BERHAD
- 31 PADINI HOLDINGS BERHAD
- 32 PARAGON UNION BERHAD
- 33 PENSONIC HOLDINGS BERHAD
- 34 POH HUAT RESOURCES HOLDINGS BERHAD
- 35 QL RESOURCES BERHAD
- 36 SPRITZER BHD
- 37 SYF RESOURCES BERHAD
- 38 UMW HOLDINGS BERHAD
- 39 XINGQUAN INTERNATIONAL SPORTS HOLDINGS LIMITED
- 40 Y.S.P.SOUTHEAST ASIA HOLDING BERHAD

#### **CONSTRUCTION**

- 41 ARK RESOURCES BERHAD
- 42 BREM HOLDING BERHAD
- 43 CREST BUILDER HOLDINGS BERHAD
- 44 DKLS INDUSTRIES BHD
- 45 EKOVEST BERHAD
- 46 FAJARBARU BUILDER GROUP BHD
- 47 GAMUDA BERHAD
- 48 HOCK SENG LEE BERHAD
- 49 IJM CORPORATION BERHAD



- 50 JAKS RESOURCES BERHAD
- 51 LEBTECH BERHAD
- 52 PINTARAS JAYA BHD
- 53 TRIPLC BERHAD
- 54 ZELAN BERHAD

#### **INDUSTRIAL PRODUCTS**

- 55 AJIYA BERHAD
- 56 ANCOM BERHAD
- 57 APM AUTOMOTIVE HOLDINGS BERHAD
- 58 BOX-PAK (MALAYSIA) BERHAD
- 59 CENTRAL INDUSTRIAL CORPORATION BERHAD
- 60 CHIN WELL HOLDINGS BERHAD
- 61 CSC STEEL HOLDINGS BERHAD
- 62 CYMAO HOLDINGS BERHAD
- 63 DOMINANT ENTERPRISE BERHAD
- 64 DUFU TECHNOLOGY CORP. BERHAD
- 65 EP MANUFACTURING BHD
- 66 FAVELLE FAVCO BERHAD
- 67 GOODWAY INTEGRATED INDUSTRIES BERHAD
- 68 HARTALEGA HOLDINGS BERHAD
- 69 HOCK HENG STONE INDUSTRIES BHD
- 70 IDEAL UNITED BINTANG BERHAD
- 71 IRE-TEX CORPORATION BERHAD
- 72 JASA KITA BERHAD
- 73 JAYA TIASA HOLDINGS BHD
- 74 KIAN JOO CAN FACTORY BERHAD
- 75 KNM GROUP BERHAD
- 76 KOSSAN RUBBER INDUSTRIES BERHAD
- 77 LEWEKO RESOURCES BERHAD
- 78 MALAYSIA STEEL WORKS (KL) BHD

- 79 MERCURY INDUSTRIES BERHAD
- 80 MIECO CHIPBOARD BERHAD
- 81 MINHO (M) BERHAD
- 82 MYCRON STEEL BERHAD
- 83 NWP HOLDINGS BERHAD
- 84 OKA CORPORATION BHD
- 85 PETRON MALAYSIA REFINING & MARKETING BHD
- 86 PNE PCB BERHAD
- 87 PRESTAR RESOURCES BERHAD
- 88 QUALITY CONCRETE HOLDINGS BERHAD
- 89 RUBBEREX CORPORATION (M) BERHAD
- 90 SANICHI TECHNOLOGY BERHAD
- 91 SAPURA INDUSTRIAL BERHAD
- 92 SARAWAK CONSOLIDATED INDUSTRIES BERHAD
- 93 SCIENTEX BERHAD
- 94 SKB SHUTTERS CORPORATION BERHAD
- 95 SOUTHERN STEEL BERHAD
- 96 SUBUR TIASA HOLDINGS BERHAD
- 97 SUPERLON HOLDINGS BERHAD
- 98 TA ANN HOLDINGS BERHAD
- 99 THONG GUAN INDUSTRIES BERHAD
- 100 TIEN WAH PRESS HOLDINGS BERHAD
- 101 TOMYPAK HOLDINGS BERHAD
- 102 TOP GLOVE CORPORATION BHD
- 103 WEIDA (M) BHD
- 104 WHITE HORSE BERHAD
- 105 WOODLANDOR HOLDINGS BHD
- 106 YLI HOLDINGS BERHAD

#### **TRADING AND SERVICES**

- 107 AEON CO. (M) BHD

- 108 AIRASIA X BERHAD
- 109 AMWAY (MALAYSIA) HOLDINGS BERHAD
- 110 ASTRO MALAYSIA HOLDINGS BERHAD
- 111 AXIATA GROUP BERHAD
- 112 AYS VENTURES BERHAD
- 113 BERJAYA SPORTS TOTO BERHAD
- 114 BHS INDUSTRIES BERHAD
- 115 BINTULU PORT HOLDINGS BERHAD
- 116 BUMI ARMADA BERHAD
- 117 CENTURY LOGISTICS HOLDINGS BERHAD
- 118 COMPLETE LOGISTIC SERVICES BERHAD
- 119 COMPUGATES HOLDINGS BERHAD
- 120 DIALOG GROUP BERHAD
- 121 EITA RESOURCES BERHAD
- 122 ESTHETICS INTERNATIONAL GROUP BERHAD
- 123 FITTERS DIVERSIFIED BERHAD
- 124 GAS MALAYSIA BERHAD
- 125 GD EXPRESS CARRIER BERHAD
- 126 GEORGE KENT (MALAYSIA) BERHAD
- 127 HANDAL RESOURCES BERHAD
- 128 HUBLINE BERHAD
- 129 INTEGRATED LOGISTICS BHD
- 130 KPJ HEALTHCARE BERHAD
- 131 LUXCHEM CORPORATION BERHAD
- 132 MBM RESOURCES BHD
- 133 MEDIA CHINESE INTERNATIONAL LIMITED
- 134 MISC BERHAD
- 135 MMC CORPORATION BERHAD
- 136 OLDTOWN BERHAD
- 137 PARKSON HOLDINGS BERHAD
- 138 PJBUMI BERHAD

- 139** SAPURA ENERGY BERHAD
- 140** SENI JAYA CORPORATION BERHAD
- 141** SIME DARBY BERHAD
- 142** TELEKOM MALAYSIA BERHAD
- 143** TENAGA NASIONAL BHD
- 144** TH HEAVY ENGINEERING BERHAD
- 145** TMC LIFE SCIENCES BERHAD
- 146** TURBO-MECH BERHAD
- 147** UTUSAN MELAYU (MALAYSIA) BERHAD
- 148** VOIR HOLDINGS BERHAD
- 149** WESTPORTS HOLDINGS BERHAD
- 150** YTL CORPORATION BERHAD

## APPENDIX C: Comparison between MCCG (2012 and 2017)

**Table 2.1: <sup>6</sup>Comparison between the MCCG (2012 and 2007)**

No.	MCCG (2012) Principle	MCCG (2012) Recommendation	Blueprint (2011) Recommendation	MCCG (2007) Code
1	Establish clear roles and responsibilities	The board should establish clear functions reserved for the board and those delegated to management; discharge its fiduciary and leadership role; formalize ethical code of conduct and ensure its compliance; ensure to promote sustainability, make access to information. The board should formalize ethical standards through a code of conduct and ensure its compliance	Mandate boards to formulate ethical standards and system of compliance through the company's code of conduct; to formalize the board charter and disclosure in the annual report	The board together with the CEO should develop position descriptions for the board and CEO; the board should explicitly assume specific responsibilities; the board should be supplied in a timely fashion with information to discharge its duties; to determine the size to impact on its effectiveness

<sup>6</sup> Source: Malaysia Code on Corporate Governance 2012 (Securities Commission Malaysia 2012)

2	Strengthen composition	The board should establish a nomination committee which should comprise exclusively of non-executive directors, a majority of whom must be independent. The board should establish formal and transparent remuneration policies and procedures to attract and retain directors and recruitment process	Mandate boards to establish a nominating company with enhanced roles chaired by an independent director	There should be a formal and transparent procedure for the appointment of directors to the board. The board should appoint a nomination committee of directors composed of exclusively non-executive directors, a majority of whom are independent. The board should appoint remuneration committees to recommend to the board the remuneration of executive directors in all its form
3	Reinforce independence	The board should undertake an assessment of its independent directors annually. The tenure of an independent director should not exceed a cumulative term of nine years. The position of chairman and CEO should be held by different individuals and the chairman must be a non-	Mandate boards to undertake an assessment on independence of director annually; a cumulative term of nine years for independent director; separating the position of chairman and CEO and for the chairman to be a non-executive member of the board	There should be a clearly accepted division of responsibilities at the head of the company which will ensure a balance of power and authority

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		executive member of the board The board must comprise a majority of independent directors where the chairman of the board is not an independent director	
4	Foster commitment	The board should set out expectations on time commitment for its members and protocols for accepting new directorships	
5	Uphold integrity in financial reporting	The audit committee should ensure financial statements comply with applicable financial reporting standard	To strengthen the role of audit committees by requiring the committees to comprise fully of non-executive directors
6	Recognize and manage risk	The board should establish a sound framework to manage risks and establish an internal audit function which reports directly to the audit committee	The board should maintain a sound system of internal control to safeguard shareholders' investment and company's assets
7	Ensure timely and high- quality disclosure	The board should ensure the company has appropriate corporate disclosure policies and procedures	Move beyond minimum reporting by making explicit the requirement for shareholders to be provided with

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quality and timely  
information

8	Strengthen relationship between company and shareholders	The board should take reasonable steps to encourage shareholder participation at general meetings. The board should promote effective communication and proactive engagements with shareholders	Mandate companies to make public their commitment to respecting shareholder rights and take active steps to inform shareholders of how these rights can be exercised	Institutional shareholders have a responsibility to make considered use of their votes. Companies and institutional shareholders should each be ready, where practicable, to enter into a dialog based on the mutual understanding of objectives. The board should maintain an effective communications policy that enables both the board and management to communicate effectively with its shareholders and the public
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