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Interrelationship between Three Dimensions of Sustainable Performance Measurement among Malaysian Manufacturing Companies

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Abstract:

Corporate financial responsibility is the sole driving force of business in the business sector, as the primary goals of a firm are to maximize profit and grow shareholder value. However, in the previous decade, larger corporate obligations have been recognized, including environmental, local community, working conditions, and ethical standards. With the rise of "sustainability" reasons, unprecedented climate change is being measured into corporate strategy in the direction of sustainable thinking. The triple bottom line (TBL) is a sustainability assessment that combines environmental and social factors in addition to profitability and the rate of return on investment. The purpose of this research is to look into the interrelationships between the three dimensions of sustainable performance measurement (SPM) in Malaysian manufacturing companies. A questionnaire is issued to 600 manufacturing companies in the Federation of Malaysian Manufacturers (FMM) as part of a quantitative data collection approach. All the proposed hypotheses are supported, thus showing the interrelationship between three dimensions of SPM existed. Consequently, Malaysian companies are lagging behind in terms of SPM's adoption compared to developed countries. Because of that, more government efforts to facilitate the adoption of SPM practice among companies are needed. The sole focus on the manufacturing industry, accuracy of data collection and time constraint are the limitations of this study. Therefore, it is suggested that further research should explore more the interrelationship between the three dimensions of SPM.

Keywords: sustainable performance measurement; economics; social; environment; manufacturing.

JEL Classification: L25; Q56.

Introduction

What is sustainability? Sustainability often being translated as environmentally friendly which is related to reducing wastage, reducing in used of energy, promoting recycle and so on, but it is broader than that instead. In the world of business, sustainability can be defined as the reconciliation of environmental, social equity and economic demands to achieve the long-term corporate success (Aminpour *et al.* 2020; Tan, Ong, Wei and Rahim 2021). Nowadays, operator of companies should put emphasis on environmental performance and corporate social responsibility other than financial performance in order to help companies being sustainable in this globalization era which is full of competition (Ahmad, *et al.* 2021).

Countries around the world are increasingly concerned in the environmental issues besides economic benefits (Lee 2013; Dwaikat & Ali 2018; Ong *et al.* 2021). This situation leads to major cities put more efforts to go green. For instance, solar-powered streetlamps are one of the examples which show the environment friendly initiative.

Malaysia is one of the countries which widely promote the practice of sustainability. Nowadays, listed companies are requested to prepare a sustainability report, which involves reporting on the economic, environmental and social performance of the companies. Since 1999, more and more listed companies are engaging in some form of environmental and social reporting. Besides that, the Sustainability Conference 2013 was held to encourage industry to innovate its products development or manufacturing process to ensure both sustainable and inclusive future growth (Innovate Approaches, 2013). The conference held is important for companies to better understand and increase awareness on the importance of sustainability.

In order to apply the practice of sustainability, sustainability performance measurement (SPM) has been developed to help companies to measure its performance. In the last ten years, SPM has increasingly been applied by various industries such as manufacturing, plantation, transportation, environmental organizations and so on in their performance measurement. In general, SPM included three dimensions, which are economic, environmental and social measurement. According to Slaper & Hall (2011), the sustainability measurement also called the triple bottom line (TBL), which includes environmental and social dimensions besides the traditional measures of profits and the rate of return on investment. TBL translates the three dimensions of SPM into profits, people and the planet. The interrelationship between the dimensions can be an important tool to support sustainability goals (Russ 2021; Tan *et al.* 2021).

It is believed that there is interrelationship between the three dimensions of SPM in measuring the performance of a company. Scholtens (2008) has pointed out two important views that are (1) good financial performance provides funds for a company to make investments in its environmental and social performance; and (2) better environmental and social performance will lead to good financial performance due to the efficient use of limited resources and high commitment of the workforce. Apparently, this interrelationship plays an important role in ensuring a company to go further in a competitive market. In this instance, it helps companies to achieve its sustainability performance in both short and long term. Thus, more and more companies in Malaysia are aware of the importance of sustainability and government is promoting it by introducing grant to support sustainability activities. Government believed that by adopting the sustainability practice, companies from various industries will able to sustain and even expand in the long run. This directly leads to prosperous of various industries in Malaysia and helps achieve its economic goals of Vision 2020.

Managing sustainability holistically is challenging which it needs additional cost, time, deep knowledge, and willingness to change. Most of the companies are facing barriers in fulfilling all the challenges. One of the barriers is short-term pressures that caused by the economic downturn in Malaysia. Economic crisis causes companies lack of additional funds to make an investment in sustainability performance and thus, sustainability is being put on the back burner to await another day. Moreover, most companies' operator feel unsupported in its approach to sustainability development. The feeling of unsupported mainly comes from shareholders. As develop sustainability is associated with risk, some shareholders may resist to take the risk and disagree to invest in it. "Comfort Zone" is also a barrier in fulfill the challenges to manage sustainability. It discouraged the business operators to step out from the comfort zone and take action to change.

Still, most companies are usually focused on economic dimension and omit the environmental and social dimensions in their performance measurement. This is mainly due to most of the company operators believed that improved environmental and social performance will mainly cause additional costs for the company and thus reduce its profitability. Even though listed companies nowadays are required to prepare sustainability report, however, the company annual report users are not necessarily read the sustainability report cover to cover (Johnson & Johnson 2007). It is believed that some users turn to a sustainability report only when it is needed.

This has discouraged companies to prepare sustainability report due to the report does not result in what companies are desired while a large amount of funds are required to perform it.

A large number of researches regarding the relationship between social and financial performance (Scholtens 2008; Gillan, Koch and Starks 2021), and the relationship between environmental and financial performance (Schaltegger and Synnestvedt 2002) had been done in previous in order to determine the value added raise by sustainability to a company. Most of the previous studies find out a positive link between the social, environmental and economic dimensions in performance measurement of a company. For instance, Schaltegger & Synnestvedt (2002) find out that improved environmental performance would reduce cost in long term and increase sales of a company and this will result in improve its economic performance. Babatunji *et al.* (2020) studied the corporate governance leading to superior sustainability performance. The study of Lee *et al.* (2021) focused on the association between strategic environmental management, and financial performance in manufacturing companies of Malaysia. Thus, sustainability may contribute to good performance of companies and interrelationship between the three dimensions of SPM is believed to exist.

Even though there are a lot of research regarding the interrelationship between the three dimensions of SPM have been done previously, however, most of them were mainly concentrated in well developed countries. There is lack of research undertaken in developing or emerging countries where SPM may require. In addition, most of the previous studies did not focus on a specific industry. Despite the importance of sustainability in every industry, the manufacturing industry is believed as one of interesting sectors to be researched as it brings a competitive edge to countries worldwide. The Industrial Revolution has transformed society's interaction with the environment and this situation led to a drastic increase in the demand for use of natural resources in the new products (Misrahi 2012). More and more customers are willing to pay more money for products that are produced by using the equipment which is operated using environmentally compliant practices. Therefore, sustainability practices are very crucial for manufacturing companies to achieve the long-term performance.

In Malaysian context, manufacturing sector contributes to a big portion of Malaysian total income. As we know, Malaysia is the world's largest producer of tin, rubber and palm oil. Update from the Economist Intelligence Unit (2012) showed that the manufacturing sector has the largest weighting in Malaysia's overall industrial production index and its output increased by 5.9% in 2012. According to Yudken (2011), manufacturing sector remains as the key focus while Malaysia is in the third state of economic development and government spent a lot on subsidies to the manufacturing sector. Based on the above, we come to an understanding that manufacturing sector is extremely crucial to Malaysia's prosperous and thus, sustainability practice should be largely applied in the manufacturing sector in order to achieve long term corporate success and contribute to Malaysia's economic goals of Vision 2020 (San Ong *et al.* 2020).

This study aims to fill the gap by empirically examine the interrelationship between three dimensions of SPM, which is economic, environmental and social factor in measuring sustainability performance of Malaysian manufacturing companies. Therefore, the research question for the study is as below:

Is there any interrelationship between three dimensions (i.e. economic, environmental and social) of sustainability performance measurement model among Malaysian manufacturing companies?

Research Objectives

i. *To determine the relationship between economic and environmental dimensions in the sustainability performance measurement of Malaysian manufacturing companies.*
ii. *To determine the relationship between environmental and social dimensions in the sustainability performance measurement of Malaysian manufacturing companies.*
iii. *To determine the relationship between social and economic dimensions in the sustainability performance measurement of Malaysian manufacturing companies.*

1. Literature Review

1.1 Economic and Environmental Dimensions/Performance

A commonly debated sustainability issues is whether there is relationship between economic and environmental dimensions of SPM. Many empirical studies have yielded mixed results. According to Burgos-Jimenez, Vazquez-Brust, Plaza-Ubeda, & Dijkshoorn (2013), who supported that financial performance has a significant positive relationship with environmental proactivity. The findings indicated that "companies with excellent environmental performance tend to have positive financial performance". For instance, the researcher found out that waste management will lead to improvement of financial performance in the medium term.

Wingard & Vorster (2001) in a similar note agreed that there is positive correlation between the environmental responsibility and the financial performance of South African listed companies, which stated that stronger environmental responsibility of a company will improve its financial performance. Similarly, Stainer & Stainer (1997) also discovered that there is reconciliation exist between environmental and financial performances. The researcher suggested that a company must consider the green scenario in building its strategies to become a world class competitor in the global market.

Research conducted by Carter & Rogers (2008) found that activities such as reducing the use of plastic bag for packaging, using more fuel-efficient resources for transportation, and requiring suppliers to participate in environmental and social programs can reduce costs and at the same time, improving corporate reputation. At the same time, Ferreira, Moulang & Hendro (2010) findings demonstrated that companies that perform well in environmental management can avoid the costs that caused by environmental damage, reduce capital cost, and create a positive image of its brand, which will lead to competitive advantage. With this competitive advantage, companies can increase its market share and lead to better financial performance. While Hanson, Melnyk, & Calantone (2004) claimed that implementation of ISO 14000 standards, which provide guidance for environmental management systems will result in costs reduction and better product quality. A study conducted by Schaltegger & Synnestvedt (2002) to discusses reasons for the different views and the differences in empirical research on the relationship between economic and environmental performances. At the end of this study, the researcher comes to an understanding that improved environmental performance would increase cost savings as well as sales and eventually improve economic performance.

However, Sarkis & Cordeiro (2001) argued that environmental performance has negative correlation with corporate financial performance. The research conducted found out that pollution prevention process was generate higher cost due to several reasons such as investment in technology which will adversely affect the companies' financial positions in short term. Moreover, Horváthová (2010) found negative link between environmental and financial performance. They claimed that environmental regulation such as pollution abatement incurred additional costs for companies as well as decreased marginal net benefits of companies.

On the other hand, Dragomir (2010) analyzed the correlation between the environmental and financial performance of companies. The findings established insignificant relationship between the two performances which showed that environmental performance will not affect the financial performance of a company and vice versa. Yu, Ting & Wu (2009) which conducted a study on 51 European companies from 14 industries across 15 countries to examine the possible relationship between company financial and environmental financial performance discovered that, there is no significant relationship between the two performances. The result suggests that high performance companies do not necessarily result in their green effort.

Various literature reviews conducted had yielded inconsistent results toward the relationship between the economic and environmental dimensions. In this study, it is anticipated that there is relationship between economic and environmental dimensions due to improved environmental performance can maximize companies profit in long term and environmental concern activities can be performed by companies only when it have strong financial position. Thus, this study proposes two hypotheses, which are:

H1: Economic dimension will affect environmental dimension of a sustainability setting.
H2: Environmental dimension will affect economic dimension of a sustainability setting.

1.2 Environmental and Social Dimensions/Performance

Hanson, Melnyk & Calantone (2004) claimed that implementation of ISO 14000 standards, which provide a guidance for environmental management systems will lead to better product quality. Product with higher quality will improve the consumers' satisfaction as consumers nowadays are required more and more. Sharing the same thoughts, Gadenne, Mia, Sands, Winata & Hooi (2012) supported that environmental performance is in positive association with social performance. The researcher claimed that environmentally friendly companies will likely to increase the satisfaction of environmentally conscious customers. Eventually, these particular environmentally friendly companies will achieve competitive advantage by retain its existing customers and acquire new customers.

According to Govindarajulu & Daily (2004) company can improve its environmental performance by encouraging its employees to actively involved in environmental programs. Employees that encouraged to actively participating in environmental programs or training will likely be motivated to perform well in environmental development. The researcher also claimed that environmental improvement of a company will not only benefit the society, but also its employees. Improved environmental performance will provide a healthy

working environment to employees. Moreover, greener product will increase the satisfaction of society as society today is increasingly asking suppliers to adopt environmental standards.

Similarly, Capaldi (2005) claimed that companies that engaged in sustainability practice are attractive to potential employees. Nowadays, employees are looking for safety working environment and surveying different companies to suit their criteria before applying for the job. Thus, sustainable thinking companies are more likely to recruit higher quality and retained their employees. In addition, Burritt, Hahn & Schaltegger (2002) proclaimed that companies' employee value performance (EVP) can be enhanced through improvement of companies' environmental performance management practices (EMPs), such as investment in environment concern programme. As such, employees' safety, health and welfare of at work can be protected from environmental accidents and disasters. Besides, companies that adopted EMPs were tended to reward its employees for good environmental performance and thus, improved employees satisfaction which will lead to higher productivity.

According to a study conducted by Follows & Jobber (2000) which tested a consumer purchasing behaviour, asserted that consumers today are consider the environmental consequences before make decision to buy a product, thus a positive link between environmental performance and consumers' satisfaction appeared. Given a choice, consumers would reject product that have negative impact on the environment. Therefore, marketing managers should consider this changed purchasing behaviour of consumers in their marketing strategies.

Vlosky, Ozanne & Fontenot (1999) conducted a study to investigate the relationships between intrinsic environmental motivations and the willingness-to-pay a premium for wood products which is environmentally certified. The findings showed a positive association between the willingness-to-pay and the independent variables in the research, which comprised of environmental consciousness, certification involvement in production and perceived importance of certification among consumers. This result indicated that environmental certification programs are gradually become a significant market-based tools to link the manufacturing and consumer purchases behavior.

At this juncture, it can be observed that numerical previous studies revealed positive results. It is believed environmental performance will affect social performance and vice versa due to companies that promoted environmentally friendly were likely to enhanced customer satisfaction and employees productivity. At the same time, companies which emphasis on employment issues such as employees' safety will tend to improvement its environmental performance to reduce accident. Thus, it is proposed that:

H3: Environmental dimension will affect social dimension of a sustainability setting.
H4: Social dimension will affect environmental dimension of a sustainability setting.

1.3 Social and Economic Dimensions/Performance

There are a number of empirical studies on the linkage between social and economic dimensions of SPM which showed mixed results. Scholtens (2008) strongly supported as cited in Wu, Yang, Ding & Zhang (2020) that there is a significant positive and association between financial and social performance. There are two views developed in the study. One view is that good financial performance of a company will provide extra funds for that particular company to make investments in social performance. Whereas second view is that good social performance will lead to the efficient use of resources and thus result in good financial performance. Whereas, Neville, Bell & Mengüç (2005) claimed that company implement strategies that involved social initiative will have a positive effect on the competitive intensity of the market in which the company competes. Therefore, the company will become competitive and improve the financial performance.

Based on a study conducted by Gilbert, Veloutsou, Goode & Moutinho (2004) showed a positive relationship between social and economic dimensions. Nowadays, companies are needed to examine the suitability of its business approaches from time to time to ensure that it can continue to satisfy its customers who possess different cultural expectations toward its product and service quality. Companies are encouraged to adopt Customer Satisfaction Survey to improve its knowledge about consumer behavior in order to improve its service quality and enhance economic growth. Moreover, research conducted by Carter & Rogers (2008) found that activities such as improving working conditions in warehouses can improve the employees' satisfaction as employees are increasingly seeking for safety working environment. Thus, lower employees' absenteeism will reduce the employee's turnover cost and eventually improve the corporate reputation.

Sharing the same thoughts, Holmes Power & Walter (1996) supported that a better working condition can enhance motivation and productivity of employees, then reduce the absenteeism of personnel and thus improve the financial performance of a company. Research had been conducted by Osman, Ho & Galang (2011) to investigate the relationship between human resource practices and company performance in Malaysia. The

findings of the study showed that human resource practices that are in conformity with the company's strategic goals are vital for company's future performance. It is important to make sure the human resource is integrated into the company's strategic plans.

According to a study conducted by Saleh, Zulkifli & Muhamad (2011) on 200 Malaysian Public Limited Companies (PLCs) on relationship between corporate social responsibility (CSR) and corporate financial performance (CFP) of Malaysian PLCs, a positive and significant relationship is exist between CSR on CFP. It is believed that strong CSR will increase companies' earnings and market value which are represented by a robust financial performance. Two dimensions of CSR are used in the research, which are employee relations and community involvement. The study reveals that CFP is enhanced when the managers have good relationship with the employees and companies should disclose all their community activities in its annual reports due to it also enhanced CFP when the companies are participated in community programmes.

Instead, Aras *et al.* (2010) discovered insignificant relationship between social dimension and financial performance or profitability among Malaysian companies. The research proposed two hypotheses, which is H1: Better financial performance results in improved CSR and H2: Improved CSR leads to better financial performance. Both hypotheses were rejected in the study. This result suggests that CSR is possible not sufficiently related to company financial and economic performance in Malaysia as a developing country yet due to CSR is still a very broad and active research topic. Similarly, Fiori, Donato & Izzo (2007) conducted a research to investigate the impact of CSR on companies' stock prices in order to analyze the relationship between companies' social and financial performance. The findings showed an insignificant correlation between CSR and companies' stock prices with explanation that CSR was considered a new issue which most investors had a low perception toward it and most investors are short-term oriented which in contrast with CSR's medium to long term impact.

McWilliam & Siegel (2000) and Aupperle, Caroll & Hatfield (1985) asserted that companies' social responsibility was shown to have a neutral or zero effect on its profitability. Aupperle *et al.* (1985) claimed that the companies that adopted social forecasting did not found to be generating higher profit than companies that without social forecasting. Thus, there was insufficient evidence to support that companies which emphasize on social responsibility were more profitable than other companies.

Even though the empirical study indicated mixed results, nevertheless, literature reviews discussed mostly yielded positive relationship between the social and economic dimensions. In this study, it is anticipated that better economic performance will lead to improved social performance and improved social performance will results in better economic performance. This was mainly due to companies with strong financial base provide extra fund to improve its social responsibility and better social performance will maximize companies profit in long term. It is therefore, suggested that:

H5: Economic dimension will affect social dimension of a sustainability setting.
H6: Social dimension will affect economic dimension of a sustainability setting.

1.4 Company Size

In term of company size, small-to medium-sized enterprises (SMEs) always been left out when come to the role of companies in addressing sustainability practice. According to a study conducted by Labonne (2006) on comparison between large and small companies in its use of environmental assessment tools, small companies were less likely aware of its own environmental impacts and thus, less examine their environmental impact. This is mainly due to the limitations of its financial and higher costs associated with the assessment tools. Condon (2004) claimed that the smaller size of SMEs provide it advantage to be able to react very quickly to the changes in the business environment. However, lack of financial and employee resources have limited SMEs' development of sustainability.

Ong *et al.* (2019) studied the impact of company size on environmental performance and found no impact. Bradford & Fraser (2008) proclaimed that sustainable assessment tools were created mainly suitable for larger companies only, thus are difficult for SMEs to utilize. Moreover, most of the SMEs still see sustainable development as less important but expensive to adopt, thus not financially worth to implement. Therefore, advice and support pertaining to sustainability strategies is needed for SMEs to carry out. However, Aragon-Correa, Hurtado-Torres, Sharma & Garcia-Morales (2008) argued that SMEs have narrow lines of communication between the managers, shareholders and employees, thus it is more agile and response quickly to implement changes. In addition, the researcher had also claimed that SMEs are easier on access to internal financial resources than larger companies due to it have a simple capital structures. Simple capital structures may facilitate SMEs to adapt to changes.

1.5 Company Age

According to Shumway (2001), company age can defined as the number of years since listing. Loderer, Neusser & Waelchli (2009a) and Loderer & Waelchli (2009b) investigated how company age affects its overall performance. The findings showed that age of companies will slowly impair its performance. This was due to as company get older, it faces low profit margins, increase in costs, obsolete of assets, decline in activities of R&D. The researcher asserted that younger companies are the best in adapt changes compared to older companies. Moreover, most companies disappear in the market were because they had been recycled in other firms. Takeover hazard was intensifies as firms grow older.

In addition, the results from research conducted by Steffens, Fitzsimmons & Davidsson (2006) indicated that young companies were produced higher growth performance and growth reduces when the companies' age. Similarly, Evans (1987) examined the relationship between companies' performance or growth and companies' characteristics with a sample of 100 manufacturing companies. The researcher found out a negative relationship between performance and age. Companies' growth will decrease as companies getting older.

However, Arrow (1962) and Jovanovic (1982) argued that older companies were more efficient than young companies because companies were able to discover its competitive advantage over competitor and learn how to do things better over time. As companies get older, it became specialized and continuously in seeking ways to standardize, speed up and improve its process of production which will result in costs reduction and quality improved at the end. Moreover, Davila (2005) explained the emergence of management control systems as a tool to achieve high performance and claimed that older companies were more likely to adopt more formalized performance measure systems. The researcher stated that management control systems are lacking in young companies due to young companies were lack of fund and experience.

2. Methodology

The objective of this study is to identify the interrelationship between three dimensions of SPM among manufacturing industry in Malaysia. This study employed quantitative method to obtain data and questionnaires are designed and distributed to the manufacturing companies from Federation of Malaysian Manufacturers (FMM). Questionnaire method is chosen because it is a cost effective and convenient research method to collect data from the respondents who are dispersed in different geographical areas.

2.1 Theoretical Framework

This study investigates the interrelationship between three dimensions of SPM among manufacturing industry in Malaysia. Three dimensions of SPM that were included in this study are economic, environmental and social dimensions. The proxies and labels that represent each variable are summarized in Table 1.

Table 1. Summary of Variables

Variables	Proxies	Labels
Dependent/Independent Variables	Economic	ECON
	Environmental	ENVIR
	Social	SOCI
Control Variables	Company Size	SIZE
	Company Age	AGE

Every dimension is acting as both dependent and independent variables when come to different objective and hypotheses. For instances, when come to *hypotheses 1: Economic dimension will affect environmental dimension of a sustainability setting*, the dependent variable is environmental dimension and independent variable is economic dimension. However, for *hypotheses 2: Environmental dimension will affect economic dimension of a sustainability setting,* economic dimension will become the dependent dimensions and environmental dimension become independent dimension. Company size and age (company profile) are used as control variables between the dependent and independent variables.

Figure 1 shows the proposed conceptual framework of this study. Based on the conceptual framework, characteristics of economic dimension are consisted of company revenue, shareholders' interest (*e.g.* net profit, earnings per share), employees' interest (*e.g.* employee benefits), and government's interest (*e.g.* taxes paid to government, tax breaks from government).

Characteristics of environmental dimension are comprises non-renewable resource productivity (*e.g.* material and energy consumption), renewable resource productivity (*e.g.* solar, wind, biomass), resources reuse

and recycle (*e.g.* energy or material recycle and reuse), waste management intensity (*e.g.* landfill waste and scrap), pollutions or emission intensity (*e.g.* CO_2) and investment on awareness and protection on environment sustainability (*e.g.* training, rule).

Characteristics of social dimension are included labour or employment issue (*e.g.* health and safety, training), labour productivity (*e.g.* operating profit per employee), employee equality or quotas (*e.g.* gender, ethnic equality), customer satisfaction (complaint from customer) and community initiative and philanthropy (*e.g.* donation).

Figure 1. Conceptual Framework
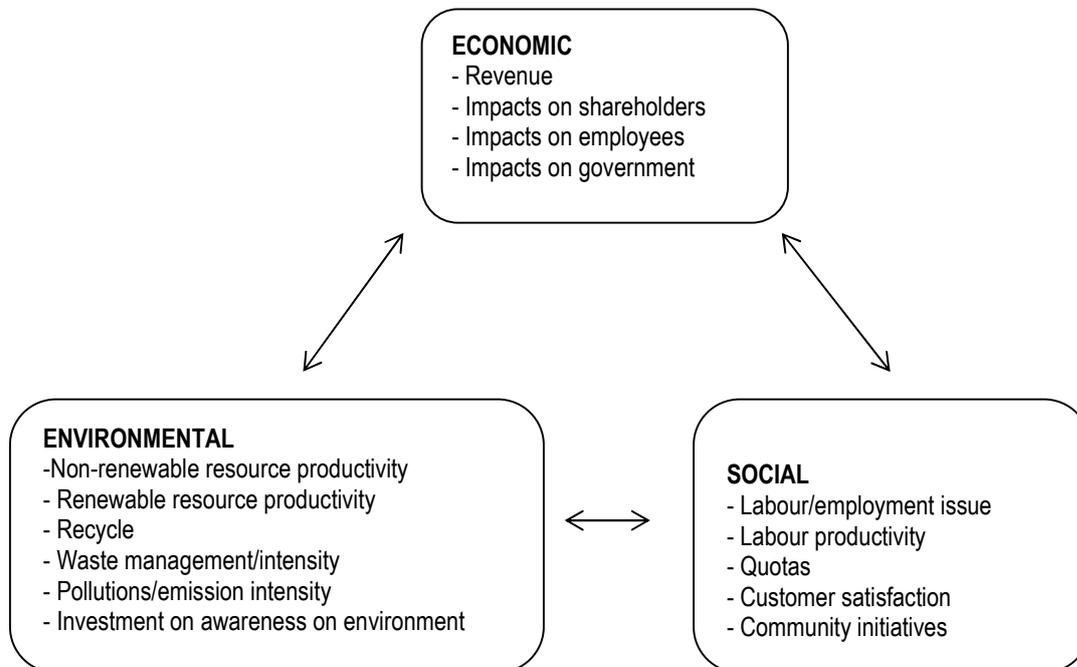
2.2 Population of Study

Population of this study comprised manufacturing companies from the Federation of Malaysian Manufacturers (FMM). FMM is a leader of private sector organizations which representing the interests of around 2,600 leading industrial establishments in the nation. There are a total of 2,500 manufacturing companies registered as member in FMM. FMM provides services to its members in term of business, trade, and management support.

In addition, FMM is a premier economic organization in Malaysia which had consistently led Malaysian manufacturers toward nation's growth and modernization. Thus, FMM is best suited to be the population of this study due to this study is focused only on manufacturing companies. Manufacturing companies have been chosen in this study because these companies play a crucial role in contributing to the large portion of Malaysian profit.

2.3 Sample Size

Randomly sampling method was used as the basis of sample selection in this study. The questionnaire was randomly sent to the 600 manufacturing companies in the population and addressed to the CEOs or the chairman of the companies. They were asked to complete the questionnaire themselves or pass it to a competent person within the companies. The reason of sending questionnaire to 600 manufacturing companies was due to compliance to the thumb rule of response rate, which is 20% as stated in the Handbook of Research Methods in Public Administration (Majumdar 2008). According multivariate of analysis, there must be at least 100 companies as sample size in conducting a research. Hence, 120 completed questionnaires are expecting to receive which represent 20% response rate on 600 manufacturing companies. Both thumb rule of response rate and sample size were met.

2.4 Measurement of Scales

Table 2 summarizes the measurement of variables and related empirical studies.

Table 2. Operationalization of Research Variables

Variables	Operationalization	Related Studies
Dependent/Independent Variables: **Economic (ECON)** Revenue Impacts on shareholders Impacts on employees Impacts on government	Total revenue Net profit and earning per share Employee monetary remunerations (*e.g.* wage, salary, bonus) and employee benefits (*e.g.* medical, dental, child-care) Taxes paid to IRB, taxes breaks/relief from IRB and subsidies received from government Sales per unit of energy consumption and sales per unit of primary material input	Burgos-Jimenez (2013), Wingard & Vorster (2001), Stainer & Stainer (1997), Schaltegger & Synnestvedt (2002), Sarkis & Cordeiro (2001), Scholtens (2008), McWilliam *et al.* (2000), Aupperle *et al.* (1985)
Environmental (ENVIR) Non-renewable resource productivity Renewable resource productivity Recycle Waste management /intensity Pollutions/emission intensity Investment on awareness on environment	Percentage of renewable energy consumption and percentage of renewable material used as input to production Percentage of reused component per product, percentage of recycled material used as input to production and percentage of energy reuses/recycles Kg waste per unit of sale and scrap per unit of sale Tons of CO_2 emissions per unit of sale and tons of CO_2 emissions per unit of electricity Training and course on environmental awareness, rule and regulation on environmental protection and third parties verification on environmental protection Number of industrial accident (source: SOCSO), employees' participation in training and development programs, commitment of in-house union in safeguarding employees' interests and average years of service Revenue per employee, operating profit per employee	Carter & Rogers (2008), Ferreira, Moulang, & Hendro (2010), Hanson, Melnyk, & Calantone (2004), Horváthová (2010), Dragomir (2010), Yu Ting, & Wu (2009), Gadenne *et al.* (2012)
Social (SOCI) Labor/employment issue Labor productivity Quotas/employee equality Customer satisfaction Community initiatives	Percentage of women in upper management and equal staff profile according to ethnic groups Market share and compliant from customer Donations and grant programs, enhancing community skill and infrastructure facilities and involvement and sponsoring community programs	Govindarajulu, & Daily (2004), Capaldi (2005), Burritt *et al.* (2002), Follows, & Jobber (2000), Neville *et al.* (2005), Carter & Rogers (2008), Aras *et al.* (2010), Fiori *et al.* (2007), Aupperle *et al.* (1985)
Control Variables: Company Size (SIZE)	Number of full time employees	Labonne (2006), Condon (2004), Bradford & Fraser (2008), Aragon-Correa *et al.* (2008)
Company Age (AGE)	Number of years in operation	Loderer *et al.* (2009a), Steffens *et al.* (2006), Evans (1987), Davila (2005)

2.5 Data Collection

The data for this study was based on primary data which was generated by questionnaire. The questionnaire was prepared in Microsoft document format designed in closed-ended question. The questionnaire consists of 3 sections. Section 1 consists of the organization profile and section 2 comprises of the respondent's profile. Section 3 was regarding the outcome of SPM model and consists of 3 parts, which were economic outcome (part A), environmental outcome (part B) and social outcome (part C). All measurements were standardized to five-point scales, with 1 being "not at all" and 5 for "large extent".

Before distribute to respondent, the questionnaire was sent to 3 lecturers of University Putra Malaysia (UPM) to check the content validity and consistency which called "Pre-Test". Ambiguous questions can be detected by having pre-test. After checked, the questionnaire was amended, and then "Pilot-Test" was carried out by randomly sent to 10 manufacturing companies among the sample of 600 manufacturing companies. The purposes of pilot-test include testing their understanding toward the questionnaire, gather information about the deficiencies and suggestions for improving the content. The 10 companies were asked to comment on the questionnaire and reply within a week. When there is no major amendment, fieldwork was carried out by which the questionnaire was launched.

The questionnaire was randomly distributed to the 600 manufacturing companies from FMM. The 600 respondents were called to inform them with the purpose of this study and later on the questionnaire was sent through post with a self-addressed, stamped return envelope addressed to the CEOs or the chairman of the companies. Respondents were given a month's time to respond. Friendly reminder was made after two weeks to ensure the respondents have received and answer the questionnaire. Due to the first posting results (response rate) was low, strategies were implemented to increase the response rate to a minimum of 20%. Thus, in the second post of the questionnaire, a wireless mouse was given to the respondents to boost up the response rate to reach the minimum rate.

2.6 Respondent's Demographic Profile

The final numbers of questionnaire that had received are 217 from manufacturing companies, with response rate more than 20%. Some of the respondent's demographic profiles are analyzed in the following part. Table 3 presents the address distribution of sample manufacturing companies. Based on the table, majority of the sample companies are from Klang Valley, which is constituted of 62.2% (135 sample companies) out of the total sample companies. The rest of the 37.8 % (82 sample companies) of the sample companies are not from Klang Valley. According to Alias *et al.* (2010) and "Malaysia Investment Performance" (2011), the state of Selangor and Kuala Lumpur (Klang Valley) are Malaysia's most developed state as well as one of the richest in the country which is driven primarily by the manufacturing and services sectors. This explained why most of the sample companies are from Klang Valley.

Table 3. Distribution of Sample Companies

Items	No. of companies	Percentage (%)
Location:		
Klang Valley	135	62.2
Non Klang Valley	82	37.8
Total	217	100
Number of years in operation:		
Newly established (≤ 10 years)	62	28.6
Moderately established (11-20 years)	68	31.3
Established (> 21 years)	87	40.1
Total	217	100
Size of Company:		
Small (< 75 employees)	110	50.7
Medium (75-200 employees)	38	17.5
Large (> 200 employees)	69	31.8
Total	217	100
Ownership:		
Malaysia-owned	149	68.7
Joint venture	34	15.7
Foreign-owned	34	15.7
Total	217	100

Table 3 shows the number of years in operation of sample companies. Based on the table, majority of the sample companies have been operated more than 21 years, which is 40.1% (87 sample companies) out of the total sample companies. These kinds of sample companies are classified as "Old Companies" due to the longer period of operation. 31.3% (68 sample companies) of the sample companies have been operated between 11 to 20 years and these companies are deemed as "Moderate Companies". There are some of the sample companies are newly incorporated which are operated less than 1 year (0 year). Result in Table 4 suggests that 28.6% (62 sample companies) of the sample companies have been operating not exceeding 10 years. These companies are deemed as "New Companies". There are some of the sample companies are newly incorporated which are operated less than 1 year (0 year).

Table 3 also illustrates the size of sample companies which is represented by number of full time employees. According to "Guideline for New SME Definition" that issued by SME Corp. Malaysia, a business will be classified as an SME if it fulfills either one of the criteria, which is number of full-time employees or total revenue (SME Corp. Malaysia, 2013). From the guideline, those businesses which have less than 75 full time employees are deemed as small companies while those businesses which have full time employees between 75 to 200 are deemed as medium companies. Businesses with more than 200 full time employees are classified as large companies.

The result in Table 3 suggests that a great majority of sample companies are having less than 75 full time employees, which is 50.7% (110 sample companies) out of the total sample companies. 31.8% (69 sample companies) of the sample companies are having more than 200 full time employees and only 17.5% (38 sample companies) of the sample companies having between 75 to 200 full time employees. This indicated that most of the sample companies are categorized as small companies and least sample companies are categorized as medium companies.

According to Table 3, the organization ownership of sample companies are mostly 100% in Malaysia, which is 68.7% (149 sample companies) out of the total sample companies, compared to only 15.7% (34 sample companies) of the sample companies are having 100% of ownership in foreign country and joint venture.

2.7 Popularity of Measures Used in Each Sustainability Dimensions

There are different number of measures (statements) used in each sustainability dimension (variable). To test the popularity of measures used in each sustainability dimension, ranking is performed and presented in Table 4. According to the table, there are 10 measures for economic dimension, 14 measures for environmental dimension and 13 measures for social dimension. Among all measures of economic dimension, net profit is the most popular measure used by the sample companies, followed by the revenue. This is consistent with most of the companies are focusing on their net profit earned and revenue generated to measure their economic performance. The least popular measure is environment incentive. This may due to the environment incentive provided by the government is not attractive enough.

Table 4. Ranking for Popularity of Measures Used in each Dimensions

Rank	Economic	Environmental	Social
1	Net Profit	Awareness	Average Year
2	Revenue	Primary Material	Revenue per Employee
3	EPS	Energy	Safeguarding
4	Remunerations	Environment Protection	Operating Profit
5	Benefits	Third Parties	Participation
6	Tax	Scrap	Community Skill
7	Relief	Reuse Component	Compliant Customer
8	Subsidies	Renewable Material	Women Management
9	Social Incentives	Energy Reuse	Equal Staff
10	Environment Incentives	Recycle Material	Size Market Share
11		Waste Kg	Donations
12		Renewable Energy	Community Program
13		Sale CO2	Industrial Accident
14		Electricity CO2	

On the other hand, the most popular measure in environmental dimension is awareness. Awareness is regarding training and course on environmental awareness for the employees. By creating the employees'

awareness on environmental issues, employees will be motivated toward achievement on environmental performance and thus company's environment performance is believed to be improved largely. The least popular measure is electricity CO2 which is about the tons of CO2 emissions per unit of electricity. Most of the companies do not use this measure due to it is difficult and time consuming to calculate tons of CO2 emissions per unit of electricity.

In social dimension, average year of service among employees is the most popular measure used. If there is high average year of service among employees, it can be interpreted as the employees are satisfied with their employer and thus the social performance of the company is achieved. In the contrary, number of industrial accidents occurred within the area of companies is the least popular measure in the social dimension. This is mainly due to most of the companies are unwilling to disclose the number of industrial accidents occurred which may has a large adverse impact on their image.

2.8 Descriptive Statistics Analysis

Table 5 presents the range of descriptive statistics for all variables. There are a number of measurements to measure each variable. Each measurement may generate different result for a variable. Thus, to make the descriptive statistics analysis simple, the results of all measurements are present in range for each variable which is shown in Table 5. According to the table, there is a total of 217 manufacturing companies as sample companies that correctly formed relevant data. The minimum value, maximum value, mean, and standard deviation for all economic, environmental and social outcomes are presented in range in the table.

Table 5. Descriptive Statistics Range for Independent and Dependent Variables

Variables	N	Minimum Range	Maximum Range	Mean Range	Std. Deviation Range
Independent/ Dependent Variables:					
ECON	217	1	5	3.00-4.14	0.824-1.307
ENVIR	217	1	5	3.24-3.78	0.912-1.126
SOCI	217	1	5	3.37-3.87	0.850-1.226
Control Variables:					
SIZE	217	2	10,000	452.03	1,253.249
AGE	217	1	101	19.27	13.205

As for the economic outcomes, the difference between minimum and maximum value is 5 with a minimum value of 1 and maximum value of 5. The minimum and maximum values for all measurements are same. The mean in range is from 3.00 to 4.14 suggesting that the mean between all measurements in economic outcomes is inconsistent. This indicated that the result generated by different measurement is different for economic outcomes. Measurement with higher mean shows higher achievement of the measurement while measurement with lower mean shows lower achievement of the measurement. The result shows that all sample companies in average have scored 3 to 4 for the measurements in economic outcomes. A score of 3 shows that the sample companies are not sure whether or not they have achieve the measurement of economic outcomes and a score of 4 represents the sample companies have achieved certain extent on the measurement of economic outcomes. The standard deviation is ranging from 0.824-1.307, which is only a small gap. This shows that the results generated by all measurements are quite consistent. Small value of standard deviation indicates that the data points tend to be very close to the mean.

The minimum and maximum values for environmental outcomes are same as the economic outcomes. Hence, the achievement of the measurement of environmental outcomes is inconsistent between all sample companies. Some sample companies have achieved large extent of measurement of environmental outcomes and some sample companies have no achieve measurement at all for environmental outcomes in their operation. The mean is range from 3.24 to 3.78 suggesting that the mean between all measurements in environmental outcomes is quite consistent. This indicates that all sample companies in average have scored 3 for the measurements in environmental outcomes. The standard deviation is range from 0.912 to 1.126, which is only a small gap. This shows that the results generated by all measurements are quite consistent. Small value of standard deviation indicates that the data points tend to be very close to the mean.

Same as both outcomes above, the minimum and maximum values for social outcomes are 1 and 5 respectively with different of 5. The mean is range from 3.37 to 3.87 suggesting that the mean between all measurements in social outcomes is quite consistent. The result indicates that all sample companies in average

have scored 3 for the measurements in social outcomes, which is same as the environmental outcomes. The standard deviation is range from 0.850 to 1.226, which is only a small gap. This shows that the results generated by all measurements are quite consistent. Small value of standard deviation indicates that the data points tend to be very close to the mean.

There are two control variables in this study, which are company size and company age. As for company size, the measurement is number of full-time employees. The minimum and maximum values are 2 and 10,000 respectively. This suggests that the distribution of number of full-time employees between sample companies is widely spread. Thus, sample companies can be small, medium, or large companies in term of company size. In addition, company size is distributed with the mean of 452.03 and standard deviation of 1,253.249. This suggests that the company size of Malaysian manufacturing companies is in the range of 452. A high standard deviation indicates that the data points are spread out over a large range of values as shown by the large gap between minimum and maximum values.

On the other hand, the measurement of company age is years in operation of the sample companies. The minimum and maximum values are 0 and 101 respectively. This suggests that the distribution of years in operation between sample companies is widely spread but not as widely as company size. Sample companies can be newly incorporated, moderate or old in term of years in operation. Mean and standard deviation for company age are 19.27 and 13.205 respectively. Hence, the company age for Malaysian manufacturing companies is in the range of 17.36. Same as company size, a high standard deviation indicates that the data points are spread out over a large range of values as shown by the large gap between minimum and maximum values.

2.9 Reliability Test (Cronbach's Alpha)

Alpha coefficient was first computed by using SPSS Statistics to measure the internal consistency of the questionnaire, and the results are shown in Table 4.3.1. As shows by the Table 6, there are 37 statements in total for 3 variables-economic, environmental and social. Detail of the statements is explained in the following section- Validity Test. The alpha coefficient is 0.947, which has reached the rule of thumb for Cronbach's alpha of > 0.7 (Bolt 1999). This indicates satisfactory internal consistency reliability. In short, the reliabilities of the questionnaires were adequate.

Table 6. Cronbach's Alpha for Reliability Test

Cronbach's Alpha	Number of Statements
0.947	37

2.10 Average Variance Extracted (AVE)

Standardized factor loadings is estimated between the statements and its variable when performing validity test which is used to check if the statement measures what it is supposed to measure. The loading values for all statements are shown in Table 7 in the validity test section later. These loading values are used to calculate the AVE. The result of AVE is shown in Table 7

The first column in the Table 7 represents all the statements in this study, while the second, third and fourth column are the standardized factor loadings which derived from Table 7 presented in later part. The column of "Item Reliability" is the squared of factor loadings (*e.g.* SocialIncentives: $0.851^2 = 0.724$). The last column is the sum of item reliability for each variable. The sum will be divided by the number of statements for each variable to derive the AVE (*e.g.* ECON: 4.265/4=0.427).

As in the table, the AVE for variables of economic, environmental and social are 0.43, 0.52 and 0.35 respectively. The results show that the statements in variable of economic and social have some error and cause unreliability due to their value of AVE are < 0.5 (AVE > 0.5 indicates adequate reliability based on the rule of thumb in Bolt, 1999). However, AVE is performed again later due to the results may change after the elimination of poor statements.

Table 7. Average Variance Extracted

Statement	ECON	ENVIR	SOCI	Item Reliability	Sum of Item Reliability
SocialIncentives	0.851			0.724	
EnviroIncentives	0.871			0.759	
Subsidies	0.837			0.701	
Relief	0.755			0.570	
Tax	0.629			0.396	
Benefits	0.546			0.298	
Remunerations	0.519			0.269	
EPS	0.597			0.356	
NetProfit	0.424			0.180	
Rev	-0.111			0.012	4.265
Thirdparties		0.368		0.135	
EnviroProtection		0.201		0.040	
Awareness		0.671		0.450	
ElectricityCO2		0.782		0.612	
SaleCO2		0.814		0.663	
Scrap		0.747		0.558	
WasteKg		0.762		0.581	
EnergyReuse		0.845		0.714	
RecycleMaterial		0.805		0.648	
ReuseComponent		0.776		0.602	
RenewableMaterial		0.795		0.632	
RenewableEnergy		0.812		0.659	
PrimaryMaterial		0.706		0.498	
Energy		0.73		0.533	7.326
CommunityProgram			0.669	0.448	
CommunitySkill			0.701	0.491	
Donations			0.641	0.411	
CompliantCustomer			0.133	0.018	
SizeMarketShare			0.221	0.049	
EqualStaff			0.703	0.494	
WomenMgt			0.764	0.584	
OperatingProfit			0.771	0.594	
RevPerEmployee			0.723	0.523	
AverageYear			0.669	0.448	
Safeguarding			0.639	0.408	
Participation			0.112	0.013	
IndustrialAccident			0.125	0.016	4.495
AVE	0.427	0.523	0.346		

2.11 Construct Reliability

Table 8 shows that there are 6 statements have a residual value > 2 with another statement. To reduce the residual value, correlation should be taken on the 5 statements due to these 5 statements showed a high residual value with statements that are from the same group. These 5 statements are operating profit, primary material, recycle material, electricity CO2 and relief. The statement of tax is needed to eliminate due to it has a high residual value with other statements which are not from the same group (*e.g.* community program and average year). Once the tax statement has been eliminated, the statement relief will unable to correlate with tax. Hence, the statements that need to correlate will reduce to 4.

After the correlation and elimination of statements, the model becomes as Figure 2. As shown in the figure, there are 4 statements for variable economic, 12 statements for environmental variable and 9 statements for social variable after the process of statements elimination. As mentioned previously, 4 correlations are created, which are primary material (Eno2) with energy (Eno1), recycle material (Eno6) with reuse component (Eno5), electricity CO2 (Eno11) with sale CO2 (Eno10) and operating profit (So6) with revenue per employee (So5). The values for the correlation are 0.51, 0.55, 0.65 and 0.50 respectively. In addition, all the standardized

factor loadings are > 0.5, which can be justified that all the statements are well explained its variable and elimination is not required.

Table 8. Summary of Standardized Residual Covariance

	RevPerEmployee	
OperatingProfit	2.319	
	CommunityProgram	AverageYear
Tax	*2.419	*2.434
	Energy	
PrimaryMaterial	3.079	
	ReuseComponent	
RecycleMaterial	2.419	
	SaleCO2	
ElectricityCO2	2.655	
	Tax	
Relief	5.244	

* Refers to statements that are not from the same group

Next, the model fit is retested. The result is shown in Table 9, 10 and 11. As in Table 9, the value of CMIN/DF is reduced to 2.161, which is < 5 and closer to 1 for a good model fit compared to previous model (3.342). The GFI shown in Table 10 is 0.813, which is still < 0.9 for a good model fit. However, according to Doll *et al.* (1994), GFI score in the 0.80 to 0.89 range is considered a reasonable fit, while a score of 0.90 or higher is considered a good fit. Thus, the GFI score in this study is reasonable. On the other hand, RMSEA in Table 11 for the new model is 0.073, which is falling in the range of moderate model fit compared to previous model (0.104). In sum, the model fit is improved and acceptable.

Table 9. New CMIN

Model	NPAR	CMIN	DF	P	CMIN/F
Default model	66	674.100	312	0.000	2.161
Saturated model	378	0.000	0		
Independence model	27	4489.480	351	0.000	12.791

Table 10. New Goodness-of-Fit Index (GFI)

Model	RMR	GFI	AGFI	PGFI
Default model	11.071	0.813	0.773	0.671
Saturated model	0.000	1.000		
Independence model	310.994	0.163	0.098	0.151

Table 11. New Root-Mean-Square Error of Approximation (RMSEA)

Model	RMSEA	LO90	HI 90	PCLOSE
Default model	0.073	0.066	0.081	0.000
Independence model	0.234	0.228	0.240	0.000

Figure 2. Data Model 3 after Standardized Residual Covariance
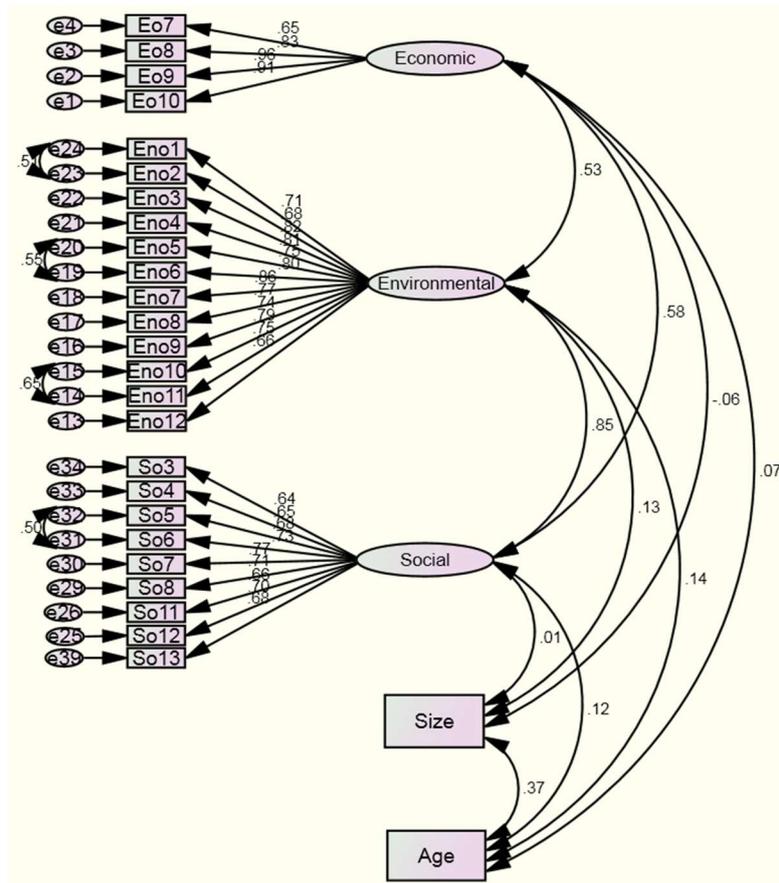
2.12 Normality Test

Before the regression analysis, a preliminary analysis, which is the normality test was conducted in order to assess whether the variables in this study had violated the assumptions of normality. This study had employed the Amos in testing the normality of the variables. The results of normality test on statements of independent variable and dependent variable are shown in Table 10. According to Amos user's guide, data are considered normal if Skewness value is between -2 to +2 and Kurtosis value is between -7 to +7. As shown in the table, both Skewness and Kurtosis values are within the range of rule of thumb for all variables. Thus, the data set is normally distributed.

Table 10 Results of Normality Test

Variable	Skewness	Kurtosis
CommunityProgram	-0.559	-0.526
Safeguarding	-1.035	1.009
AverageYear	-0.726	0.732
RevPerEmployee	-0.894	1.192
OperatingProfit	-0.802	0.861
WomenMgt	-0.561	-0.041
EqualStaff	-0.701	0.258
Donations	-0.420	-0.083
CommunitySkill	-0.457	-0.083
Energy	-0.600	0.142
PrimaryMaterial	-0.834	0.788
RenewableEnergy	-0.367	-0.206
RenewableMaterial	-0.366	-0.083
ReuseComponent	-0.531	-0.113
RecycleMaterial	-0.452	-0.324

Variable	Skewness	Kurtosis
EnergyReuse	-0.435	-0.108
WasteKg	-0.244	-0.252
Scrap	-0.383	0.003
SaleCO2	-0.214	-0.096
ElectricityCO2	-0.112	-0.377
Awareness	-0.780	0.172
Relief	-0.767	-0.074
Subsidies	-0.189	-0.877
EnviroIncentives	-0.177	-0.936
SocialIncentives	-0.163	-0.933

2.13 Regression Analysis

Regression analysis was employed to explore the interrelationship between three dimensions of SPM which measure in economic, environmental, and social, after controlling for the influence of company size and age on the sample companies selected. Table 11 indicates the impact of independent variables on dependent variables in different model (equation). For the reason, coefficient of determination (R^2) (called Squared Multiple Correlations in Amos) is determined for each regression model to find out the percentage of the dependent variable is explained by the regression.

In this study, models 1 and 2 are grouped into one category, model 3 and 4 group into one category, and model 5 and 6 group into one category. This is because this study is examining the interrelationship between economic, environmental and social and thus there are three interrelationships were examined. Two models are generated for one interrelationship. In consequences, most of the results generated will be same for the two models that represent one interrelationship, such as R^2, unstandardized or standardized coefficients and so on.

Based on the table, the value of R^2 for both models 3 and 4 are 0.72, which is the highest among all models. This illustrates that the regression could significantly account for 72% of the total variation in the social dimension (dependent variable in model 3) and environmental dimension (dependent variable in model 4). Meanwhile, 28% of the variation of the social and environmental dimensions could not be present by the two regression models. Therefore, 72% of the social dimension tends to be highly affected by environmental dimension (independent variable in model 3); 72% of the environmental dimension tends to be highly affected by social dimension (independent variable in model 4). R^2 value for model 1 and model 2 is 0.28 while the R2 value for model 5 and model 6 is 0.34.

Table 11. Squared Multiple Correlations (R^2)

Equations / Models	R^2
Model 1: ENVIR = α + β1 ECON + β2 SIZE + β3 AGE + ε Model 2: ECON = α + β1 ENVIR + β2 SIZE + β3 AGE + ε	0.28
Model 3: SOCI = α + β1 ENVIR + β2 SIZE + β3 AGE + ε Model 4: ENVIR = α + β1 SOCI + β2 SIZE + β3 AGE + ε	0.72
Model 5: SOCI = α + β1 ECON + β2 SIZE + β3 AGE + ε Model 6: ECON = α + β1 SOCI + β2 SIZE + β3 AGE + ε	0.34

Table 12 presents the summary of regression coefficients for the 6 models. According to the table, independent variable has significant positive relationship with dependent variable in all 6 models. The result of the regression analysis shows that the independent variable is respectively significant at 0.01 levels for all 6 models (P < 0.001). Among the 6 models, models 5 and 6 have the independent variables which possess the highest impact on the dependent variables. For instance, in the model 5, the economic dimension (independent variable) has a beta value (β) equal to 0.474. This means that one unit increases in the economic dimension resulted increase in 0.474 units of social dimension (dependent variable).

Independent variables (environmental and social dimensions) in models 3 and 4 have lowest impact on the dependent variables (social and environmental dimensions) because every one unit increase in independent variables only resulted in increase in 0.415 unit of dependent variable. However, the results are still significant. On the contrary, control variables of company size and age show insignificant relationship with the dependent variable in all 6 models (P > 0.05).

Table 12. Summary of Regression Coefficients

Dependent Variable	Variable	Unstandardized Coefficients	
		Beta (β)	Std. Error
Environmental / Economic (model 1 & 2)	Economic / Environmental	0.443^{***}	0.077
	Size: (DV=ENVIR) Size: (DV=ECON)	111.407^{ns} -89.851^{ns}	63.425 103.686
	Age: (DV=ENVIR) Age: (DV=ECON)	1.342^{ns} 1.045^{ns}	0.672 1.093
Social / Environmental (model 3 & 4)	Environmental / Social	0.415^{***}	0.063
	Size: (DV=SOCI) Size: (DV= ENVIR)	6.834^{ns} 111.407^{ns}	62.370 63.425
	Age: (DV=SOCI) Age: (DV= ENVIR)	1.131^{ns} 1.342^{ns}	0.666 0.672
Social / Economic (model 5 & 6)	Economic / Social	0.474^{***}	0.077
	Size: (DV=SOCI) Size: (DV= ECON)	6.834^{ns} -89.851^{ns}	62.370 103.686
	Age: (DV=SOCI) Age: (DV= ECON)	1.131^{ns} 1.045^{ns}	0.666 1.093

*** represents $P < 0.001$; ^{ns} represents non-significant

2.14 Hypothesis Testing

Table 13 summarizes the hypothesis testing. All hypotheses are supported. Hypotheses 1 and 2 claimed that there is interrelationship between economic and environmental dimension. These two hypotheses were supported at the 0.01 level of significance ($P < 0.001$) with a correlation of 0.527. Hypotheses 3 and 4 claimed that there is interrelationship between environmental and social dimensions and supported at the 0.01 significance level as well with a correlation of 0.846, which is the highest correlation value. Lastly, hypotheses 5 and 6 which claimed that there is interrelationship between environmental and social dimensions were also supported at the 0.01 significance level with a correlation of 0.580.

Table 13. Results of Hypothesis Testing

Hypothesis	Relationship between Variables	Standardized Regression Weight	Level of Significant	Hypothesis Test Outcome
H1: Economic dimension will affect environmental dimension of a sustainability setting	Economic → Environmental	0.527	$P < 0.001$	Supported
H2: Environmental dimension will affect economic dimension of a sustainability setting	Environmental → Economic			
H3: Environmental dimension will affect social dimension of a sustainability setting	Environmental → Social	0.846	$P < 0.001$	Supported
H4: Social dimension will affect environmental dimension of a sustainability setting	Social → Environmental			
H5: Economic dimension will affect social dimension of a sustainability setting	Economic → Social	0.580	$P < 0.001$	Supported
H6: Social dimension will affect economic dimension of a sustainability setting	Social → Economic			

3. Discussion:

Interrelationship between Economic and Environmental Dimensions

The two hypotheses proposed for this interrelationship are:

H1: Economic dimension will affect environmental dimension of a sustainability setting.

H2: Environmental dimension will affect economic dimension of a sustainability setting.

Both hypotheses are supported based on the results presented. This study reveals that there is a significant positive interrelationship between economic and environmental dimensions. One of the reasons that causes these results is that government in Malaysia is more and more concern with the environmental issues and various efforts have been implemented to encourage companies to go green. For instance, government encourages the use of deproteinized natural rubber among manufacturing companies in the production of rubber gloves to comply with international standards, provides Pioneer Status tax exemption and Investment Tax Allowance for the manufacture of environment friendly products, provides import duty or sales tax exemption for companies that practice energy conservation as well as generating energy from renewable sources for own consumption and so on.

Despite the incentive from the government, consumers have also changed their purchasing patterns for more environmentally friendly products. Such incentives and pressures have made companies strongly feel that economic and environmental performance should be achieved together for companies to be more sustainable. On the other hand, it is believed that environmental concern activities can be performed by companies only when it has a strong financial position. Hence, the hypotheses that proposed interrelationship between economic and environmental dimensions are supported. The results in this study contradict with the results of Dragomir (2010) and Yu *et al.* (2009) which found no significant relationship between economic and environmental dimensions. In these studies, the result suggested that high performance companies do not necessarily result in their green effort.

However, the result of this study perhaps was unsurprising since there are previous studies also shown the result that is consistent with this study. For example, Burgos-Jimenez *et al.* (2013) and Wingard & Vorster (2001) claimed that companies with excellent environmental performance tend to have positive financial performance. In addition, research conducted by Carter & Rogers (2008) found that environmental concern activities such as reducing the use of plastic bag can reduce costs as well as improving the corporate reputation. While Hanson, Melnyk, & Calantone (2004) stated that a strong financial position is necessary for environmental concern activities to be performed well because such activities cost a lot.

Interrelationship between Environmental and Social Dimensions

The two hypotheses proposed for this interrelationship are:

H3: Environmental dimension will affect social dimension of a sustainability setting.

H4: Social dimension will affect environmental dimension of a sustainability setting.

The result of this study reveals that there is a significant positive interrelationship between environmental and social dimensions, thus it supports the H3 and H4. The main reason that causes this result is that customers and employees nowadays are more and more concerning on environmental issues. Customers request eco-friendly products from companies and employees are looking for a safety working environment as well as companies that are environmentally friendly. Therefore, companies believed that with green thinking, it is more likely to attract and retain customers and employees. On the other hand, companies can improve its environmental performance by encouraging its employees to actively involve in environmental programs or training. As a result, employees will likely be satisfied and then motivated to perform well in companies' environmental development.

The result in this study is consistent with Gadenne *et al.* (2012) and Follows & Jobber (2000) which supported that environmental performance is in positive association with social performance. The researchers claimed that the environmentally conscious customers can be satisfied by environmentally friendly companies. Furthermore, Capaldi (2005) asserted that companies that practice sustainable thinking are able to attract new employees which concern with the environmental issues. While Govindarajulu & Daily (2004) indicated that by encouraging employees to actively involved in environmental programs such as provide benefits, companies' environmental performance can be significantly improved.

Interrelationship between Social and Economic Dimensions
The two hypotheses suggested for this interrelationship are:
H5: Economic dimension will affect social dimension of a sustainability setting.
H6: Social dimension will affect economic dimension of a sustainability setting.

The result of this study has shown that there is a significant positive interrelationship between social and economic dimensions. Therefore, it supported the H5 and H6. One of the reasons that contribute to this result is the effort of government in promoting the corporate social responsibility of companies. For instance, companies which invest in the Industrialized Building System (IBS) are eligible for Accelerated Capital Allowances (ACA) for a period of 3 years effective from 2006 ("Malaysia – Incentives for Investment," 2006). IBS helps mainly in creating a safer and cleaner working environment in companies as well as reducing the dependence on foreign workers. This incentive has attracted companies to be more socially responsible in order to achieve better financial performance.

Furthermore, customers well equipped with real time information and updates from social media are increasingly demanding, such as better product quality with lower price. Customers may shift to other companies if their demands are not fulfill and this can bring huge losses to the companies. This situation forces the companies strive to satisfy their demand to obtain larger market shares. On the other hand, financial performance of a company will affect its social performance due to good financial performance will provide extra funds for that particular company to make investments in social performance. Hence, the hypotheses that proposed interrelationship between social and economic dimensions are supported.

Most of the empirical study yielded positive relationship between the social and economic dimensions, such as Scholtens (2008) and Neville *et al.* (2005). Carter & Rogers (2008) and Holmes *et al.* (1996) supported that a better working condition should be provided to employees to enhance motivation and productivity of the employees, following by reducing the absenteeism of employees and eventually, improve the financial performance of the company. Moreover, Gilbert *et al.* (2004) suggested companies adopt Customer Satisfaction Survey in order to improve its knowledge about consumer behavior to help improving its service quality as well as enhance economic growth. These set of indicators that covers the main aspects of sustainability performance can be useful for industrial companies' management, according to the TBL approach (Hourneaux, Gabriel, Gallardo-Vázquez 2018).

Influence of Control Variables on Dependent Variable
The results of this study indicated that there is no significant relationship between the control variables of company size and age with dependent variable (economic, environmental and social dimensions). The result contradicted with the previous studies such as Condon (2004), Steffens *et al.* (2006) and Evans (1987) that found out a relationship between performance and company age as well as company size. This may due to the independent variable are affected by a lot of factors other than company size and age, such as the company's strategies, organization structure, company's ownership, and so on.

Conclusion

As a conclusion, this study conveys that the interrelationship between three dimensions of SPM is exists and thus, the sustainability goal is supported. Since the interrelationship is proven in this study, companies should be more confident and proactive to embarking in the sustainability activities. However, despite the evidence, Malaysian companies are still lagging behind in the application of SPM practice compared to developed countries even though all the hypotheses proposed in this study are accepted. The main reason is the low awareness of SPM among Malaysian companies. Low awareness cause most Malaysian companies unwilling to accept the challenge bring by SPM practice. Thus, additional efforts are needed from government to facilitate the adoption of sustainability activities among companies to encourage them in the regards of SPM.

Although this study provides evidence on the existence of interrelationships between the three dimensions of SPM, the results should be considered based on limitations of this study. The limitations of this study include the sole focus on manufacturing industry, where besides manufacturing industry, there are other industries that supposedly prone to sustainability issues. Other limitations such as the accuracy of data collection might not be too precise due to the voluntary respond to the questionnaire and the time constraint issue in terms of collecting the data. Therefore, as a suggestion, further research should explore more on the interrelationship between three dimensions of SPM in order to provide more evidence on the linkages and its implications.

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References

[1] Ahmad, N., *et al.* 2021. Relationship between corporate social responsibility at the micro-level and environmental performance: The mediating role of employee pro-environmental behavior and the moderating role of gender. *Sustainable Production and Consumption*, 27: 1138-1148.

[2] Alias, N. Z., Rashid, M. A. A. and Foo, K. C. 2010. The state of Selangor. Economic Research. *Malaysian Rating Corporation Berhad, 001*, 1-8.

[3] Aminpour, P. *et al.* 2020. Perspectives of scholars on the nature of sustainability: a survey study. *International Journal of Sustainability in Higher Education,* 21 (1): 34-53.

[4] Aragon-Correa, J. A., Hurtado-Torres, N., Sharma, S. and Garcia-Morales, V. J. 2008. Environmental strategy and performance in small firms: a resource-based perspective. *Journal of Environmental Management, 86:* 88-103.

[5] Aras, G., Aybars, A. and Kutlu, O. 2010. Managing corporate performance. *International Journal of Productivity and Performance Management, 59*(3): 229-254.

[6] Arrow, K. J. (1962). The economic implications of learning by doing. *Review of Economic Studies, 29*(3): 155-173.

[7] Aupperle, K. E., Caroll, A. B. and Hatfield, J. B. 1985. An empirical examination of the relationship between corporate social responsibility and profitability. *Academy of Management Journal, 28*(2): 446-463.

[8] Babatunji. S.A., Ong, T.S., Md Uzir, H.U. and Abu Bakar, A.H. 2020. Corporate governance and performance of medium-sized firms in Negeria: does sustainability initiative matter? *Corporate Governance*, 20(3): 401-427

[9] Bolt, M. A. (1999). *Statistical analysis.* Virginia Polytechnic Institute and State University.

[10] Bradford, J. and Fraser, E. D. G. 2008. Local authorities, climate change and small and medium enterprises: identifying effective policy instruments to reduce energy use and carbon emissions. *Corporate Social Responsibility and Environmental Management, 15*(3): 156-72.

[11] Burgos-Jimenez, J. D., Vazquez-Brust, D., Plaza-Ubeda, J. A. and Dijkshoorn, J. 2013. Environmental protection and financial performance: An empirical analysis in Wales. *International Journal of Operations & Production Management, 33*(8): 981-1018.

[12] Burritt, R. L., Hahn, T. and Schaltegger, S. 2002. Towards a comprehensive framework for environmental management accounting-links between business actors and environmental management accounting tools. *Australian Accounting Review, 12*(2): 39-50.

[13] Capaldi, N. 2005. Corporate social responsibility and the bottom line. *International Journal of Social Economics, 32*(5): 408-23.

[14] Carter, C. R. and Rogers, D. S. 2008. A framework of sustainable supply chain management: moving toward new theory. *International Journal of Physical Distribution & Logistics Management, 38*(5): 360-387.

[15] Condon, L. 2004. "Sustainability and small to medium sized enterprises: how to engage them". Paper presented at Effective Sustainability Education: What Works? Why? Where Next? *Linking Research and Practice Conference, Sydney.*

[16] Davila, T. 2005. An exploratory study on the emergence of management control systems: Formalizing human resources in small growing firms. *Accounting, Organizations and Society, 30*: 223–248.

[17] Doll, W. J., Xia, W. and Torkzadeh, G. 1994. A confirmatory factor analysis of the end-user computing satisfaction instrument. *MIS Quarterly, 18*(4): 453–461.

[18] Dragomir, V. D. 2010. Environmentally sensitive disclosures and financial performance in a European setting. *Journal of Accounting & Organizational Change, 6*(3): 359-388.

[19] Dwaikat, L. N. and Ali, K. N. 2018. The economic benefits of a green building–Evidence from Malaysia. *Journal of Building engineering*, 18: 448-453.

[20] Evans, D. S. 1987. The relationship between firm growth, size, and age: Estimates for 100 manufacturing industries. *The Journal of Industrial Economics, 35*(4): 567-581.

[21] Ferreira, A., Moulang, C. and Hendro, B. 2010. Environmental management accounting and innovation: an exploratory analysis. *Accounting, Auditing & Accountability Journal, 23*(7): 920-948.

[22] Fiori, G., Donato, F. and Izzo, M. F. 2007. Corporate social responsibility and firms' performance: an analysis on Italian listed companies. *SSRN Working Paper Series.*

[23] Follows, S. B. and Jobber, D. 2000. Environmental responsible purchase behaviour: a test of the consumer model. *European Journal of Marketing, 34*(5/6): 723-746.

[24] Gadenne, D., *et al.* 2012. The influence of sustainability performance management practices on organisational sustainability performance. *Journal of Accounting & Organizational Change, 8*(2): 210-235.

[25] Gilbert, G. R., Veloutsou, C., Goode, M. M. H. and Moutinho, L. 2004. Measuring customer satisfaction in the fast-food industry: a cross-national approach. *Journal of Services Marketing, 18*(5): 371-383.

[26] Gillan, S. L., Koch, A. and Starks, L. T. 2021. Firms and social responsibility: A review of ESG and CSR research in corporate finance. *Journal of Corporate Finance*, 101889.

[27] Govindarajulu, N., & Daily, B. F. 2004. Motivating employees for environmental improvement. *Industrial Management & Data Systems, 104*(4), 364-372.

[28] Hanson, J. D., Melnyk, S. A. and Calantone, R. J. 2004. Core values and environmental management. *Greener Management International, 46:* 29-40.

[29] Hasnas, J. 1998. The normative theories of business ethics: A guide for the perplexed. *Business Ethics Quarterly, 8*(1): 19-42.

[30] Holmes, S. M., Power, M. L. and Walter, C. K. 1996. A motor carrier wellness program: development and testing. *Transportation Journal, 35*(3): 33-48.

[31] Horváthová, E. 2010. Does environmental performance affect financial performance? A meta-analysis. *Ecological economics*, 70(1): 52-59.

[32] Hourneaux Jr. F., Gabriel, M.L.S. and Gallardo-Vázquez, D. A. 2018. Triple bottom line and sustainable performance measurement in industrial companies. *Revista de Gestão*, 25(4): 413-429. DOI:https://doi.org/10.1108/REGE-04-2018-0065

[33] Johnson & Johnson. 2007. *Sustainability Report*.

[34] Jovanovic, B. 1982. Selection and the evolution of industry. *Econometrica, 50*(3): 649-670.

[35] Labonne, J. 2006. A comparative analysis of the environmental management, performance and innovation of SMEs and larger firms. *For the European Commission, Directorate-General Environment, CL Conseil, Saint Michel Sur Orge,* 1-44.

[36] Lee, A. S., *et al.* 2021. Strategic Management for Superior Environmental and Financial Performance in Malaysian Manufacturing Firms. *Journal of Sustainability Science and Management*, 16(6): 274-291.

[37] Lee, J. 2013. Cyberjaya continues to focus on sustainability as a key economic driver. *The Star Online.* Retrieved September 28, 2013, from http://www.thestar.com.my/story.aspx?file=%2f2013%2f6%2f21%2fnorth%2f13269219&sec=north

[38] Loderer, C. and Waelchli, U. 2009b. Firm age and performance. *Working paper,* University of Bern, Switzerland.

[39] Loderer, C., Neusser, K. and Waelchli, U. 2009a. Firm Age and Survival. *Working paper,* University of Bern, Switzerland.

[40] Majumdar, S. R. 2008. Handbook of Research Methods in Public Administration, *Using the Survey as an Instrument of Inquiry in Research (241-254).* United State, US: Taylor and Francis Group.

[41] Mcwilliams, A. and Siegel, D. 2000. Corporate social responsibility and financial performance: Correlation or misspecification*? Strategic Management Journal, 21:* 603-609.

[42] Misrahi, T. 2012. Is a sustainable manufacturing industry economically viable? *World Economic Forum.* Retrieved October 27, 2013, from http://forumblog.org/2012/02/sustainable-manufacturing/

[43] Neville, B. A., Bell, S. J. and Menguc, B. 2005. Corporate reputation, stakeholders and the social performance-financial performance relationship. *European Journal of Marketing, 39*(9/10): 1184-1198.

[44] Ong, T. S., Magsi, H. B. and Burgess, T. F. 2019. Organisational culture, environmental management control systems, environmental performance of Pakistani manufacturing industry. *International Journal of Productivity and Performance Management*, 68(7): 1293-1322.

[45] Ong, T.S. *et al.* 2020. Environmental capabilities and environmental innovations of manufacturing firms in Malaysia. *Indonesian Journal of Sustainability Accounting and Management*, 4(1): 1-12.

[46] Ong, T.S., Lee, A.S. and The, B.H. 2021. Turning Environmental Strategies into Competitive Advantage in the Malaysian Manufacturing Industry: Mediating Role of Environmental Innovation*. Pertanika Journal of Social Sciences and Humanities*, 29 (2): 1293-1312

[47] Osman, I., Ho, T. C. F. and Galang, M. C. 2011. The relationship between human resource practices and firm performance: an empirical assessment of firms in Malaysia. *Business Strategy Series, 12*(1): 41-48.

[48] Russ, M. 2021. Knowledge management for sustainable development in the era of continuously accelerating technological revolutions: A framework and models. *Sustainability*, 13(6): 3353.

[49] Saleh, M., Zulkifli, N. and Muhamad, R. 2011. Looking for evidence of the relationship between corporate social responsibility and corporate financial performance in an emerging market. *Asia-Pacific Journal of Business Administration, 3*(2): 165-190.

[50] Sarkis, J. and Cordeiro, J. J. 2001. An empirical evaluation of environmental efficiencies and firm performance: Pollution prevention versus end-of-pipe practice. *European Journal of Operational Research, 135*: 102-113.

[51] Schaltegger, S. and Synnestvedt, T. 2002. The link between 'green' and economic success: environmental management as the crucial trigger between environmental and economic performance. *Journal of Environmental Management, 65:* 339-346.

[52] Scholtens, B. 2008. A note on the interaction between corporate social responsibility (CSR) and financial performance. *Ecological Economics, 68*: 46-55.

[53] Shumway, T. 2001. Forecasting bankruptcy more accurately: A simple hazard model. *Journal of Business, 74*: 101-124.

[54] Slaper, T. F. and Hall, T. J. 2011. The triple bottom line: what is it and how does it work? *Indiana Business Review.*

[55] Stainer, A. and Stainer, L. 1997. Ethical dimensions of environmental management. *European Business Review, 97*(5): 224-230.

[56] Steffens, P., Fitzsimmons, J. and Davidsson, P. 2006. Small firm performance: Patterns of evolution in growth-profitability space. *Proceedings Academy of Management Conference*, Hawaii.

[57] Tan, C. L., Ong, T.S, Wei, N. I. and Rahim, N. A. 2021. Sustainable Economic Development and Environmental Performance of Developing and Developed Countries. *Journal of Environmental Management and Tourism*, 12(2): 429-443.

[58] Vlosky, R. P., Ozanne, L. K. and Fontenot, R. J. 1999. A conceptual model of US consumer willingness-to-pay for environmentally certified wood products. *Journal of Consumer Marketing, 16*(2): 122-136.

[59] Wingard, H. and Vorster, Q. 2001. Financial performance of environmentally responsible South African listed companies. *Meditari Accountancy Research, 9*: 313-332.

[60] Wu, L., *et al.* 2020. The impact of CSR and financial distress on financial performance - evidence from Chinese listed companies of the manufacturing industry. *Sustainability*, 12(17): 6799.

[61] Yu, V., Ting, H. and Wu, Y. J. 2009. Assessing the greenness effort for European firms. *Management Decision, 47*(7): 1065-1079.

[62] Yudken, J. 2011. Energy pricing and manufacturing competitiveness in Malaysia. *Economic Planning Unit*. Unpublished manuscript.

[63] Innovate approaches, says MPMA Association advocates sustainability for the manufacturing industry. (2013, September 9). *The Star Online.* Retrieved September 28, 2013, from www.thestar.com.my/Business/SME/2013/09/_09/Innovate-approaches-says-MPMA-Association-advocates-sustainability-for-the-manufacturing-industry.aspx

[64] Malaysia – *Incentives for Investment. 2006. Malaysian Industrial Development Authority,* 1-50.

[65] Malaysia Investment Performance. 2011. *Malaysian Investment Development Authority (MIDA),* 1-105.

[66] Malaysia Needs New Growth Strategy to Achieve Vision 2020 Goals: Tun Dr. Mahathir. 2010. *Perdana Magazine Online.* Retrieved October 12, 2013, from http://www.perdana.org.my/emagazine/2010/10/malaysia-needs-new-growth-strategy-to-achieve-vision-2020-goals-tun-dr-mahathir/

[67] SME Corp. Malaysia. 2013. Guideline for New SME Definition. *National SME Development Council,* 1-5.

[68] Sustainability. 2013. *Bursa Malaysia.* Retrieved November 2, 2013, from http://www.bursamalaysia.com/market/listed-companies/sustainability/