

Influence of sustainable practices on firm performance: Evidence from the FTSE Russell ESG Index adopted by Bursa Malaysia

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ABSTRACT

This study examined the relationships between workplace health and safety, corporate governance, environmental management, and firm performance from a financial-outcome perspective. The exogenous construct was overall sustainable practice, which was used to predict firm performance. A total of 151 corporate executives participated in the study, and a systematic sampling method was used. Data were collected through a self-administered questionnaire and analysed using Pearson correlation and multiple linear regression for hypothesis testing. The overall regression model significantly predicted firm performance. All three sustainable-practice dimensions were positively correlated with firm performance; however, only environmental management was a statistically significant predictor in the multiple regression model. Sustainable practices may improve a company's ability to generate revenue, build brand recognition, increase operational effectiveness, and attract investors, employees, and clients. Although implementing these policies may involve initial costs, sustainability has become a strategic requirement for modern enterprises, and the long-term benefits may exceed the expenditures.

Keywords: corporate governance, environmental management, firm performance, sustainable practices, workplace health and safety

INTRODUCTION

Sustainable development is no longer a trend; it is a necessity. Many countries have adopted more aggressive sustainability policies. France, for example, banned single-use plastics beginning in 2020, while Iceland is widely recognised for its low air emissions, extensive green landscapes, high water quality, and strong environmental policies.

Melinda and Wardhani (2020), in a recent Asian-context study of the relationship between the Thomson Reuters ESG Index and firm value across 22 Asian countries, found that ESG index scores had a statistically significant effect on firm value as measured by Tobin's Q. Their study demonstrates that ESG disclosure is important not only for increasing corporate value but also for signalling organisational resilience and sustainability. Similarly, Laskar and Gopal Maji (2018), using secondary data from Japan, South Korea, Indonesia, and India, found a positive and significant relationship between corporate sustainability performance and firm performance in all four countries.

The petrochemical industry manufactures chemical products derived from crude oil, and the same chemical compounds can also be obtained from other fossil fuels such as natural gas and coal, or renewable sources, and it can be conveniently divided into two groups: primary petrochemicals and intermediates and derivatives (Speight, 2020). Malaysia's petrochemical sector has expanded significantly in recent decades. Petronas contributed 62 per cent of total investment in this sector in 2008, and the largest foreign contributors to the industry were the United States, Germany, and Japan, accounting for 40 per cent, 22.8 per cent, and 14 per cent of total foreign investments, respectively (MGCC, 2008).

A firm's financial performance is an indicator of its ability to generate revenue using its core resources and business model. The concept is commonly used to assess a company's overall financial stability over time. Investors and analysts use financial reports to compare related firms in the same industry or to evaluate potential mergers. These reports provide information about a company's overall health, while financial indices offer quantifiable indicators of organisational efficiency. However, no single statistic can fully measure a company's financial performance (Kumar, 2017).

Trading creditors, securities sellers, clients, employees, and managers are among the actors with an interest in a corporation's financial performance. Financial results show how effectively a company raises money and manages its assets, liabilities, and owners' financial needs. Financial performance can be calculated in several ways, but each measure should be considered in its full context. Analysts and investors may examine line items such as acquisitions, corporate profits, cash balances, and total unit sales. They may also assess incremental growth or debt-reduction rates. Other suitable indicators of firm performance include improved market positioning, increased sales volume, and enhanced reputation (Lin et al., 2013).

LITERATURE REVIEW

Sustainability, according to Kocmanova et al. (2011), is a corporate strategy that incorporates economic, environmental, and social performance into corporate management to monitor long-term corporate growth, efficiency, performance, and competitiveness. This is one of the most apt descriptions for delivering clarity to corporate entities since it exactly echoes the attitude of John Elkington's Triple Bottom Line (TBL) concept (Amacha & Dastane, 2017). In this triple bottom line theory, business organisations are expected to be accountable for their economic, social, and environmental bottom lines by giving equal weight to each of these aspects of their operations, which serves as a guide for policy formulation and performance measurement (Sridhar & Jones, 2013).

According to Norman and MacDonald (2003), the TBL theory places equal importance on the linkage between the planet, people, and profit, stating that the majority of the material inputs for businesses come from the planet, people are the key enablers in the process of converting these inputs to outputs, and profits reaped by businesses come from these activities.

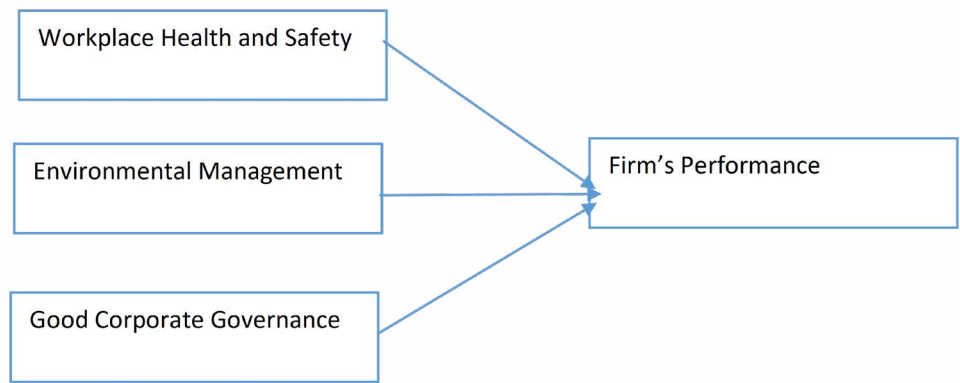
Companies always attempt to ensure that society perceives them as working within society's expectations, and they eventually want society's support that they are operating legitimately, according to the legitimacy theory. Noting the importance of 'legitimacy' it is considered as essential 'resource' and they may do whatever it takes to sustain such as targeted disclosures or reporting (Chiong, 2010).

Another important theory relevant to this study is stakeholder theory. It shares many similarities with legitimacy theory, but the two differ in how they conceptualise society's expectations. Legitimacy theory views those expectations as a single social contract between the firm and society, whereas stakeholder theory views them as a collection of social contracts between the company and various stakeholder groups, each with different expectations. This results in the company having multiple negotiated social contracts with different stakeholders in society (Chiong, 2010). Legitimacy theory therefore examines society at the macro level, while stakeholder theory examines it at the micro level.

Corporate sustainability means shifting a company's financial bottom line into a triple bottom line that includes environmental and social concerns, and businesses have realised that relying solely on their businesses' economics is no longer enough to stay relevant in a changing market (Chiong, 2010). A corporation's capacity to build a sound business plan is becoming increasingly reliant on how well it positions itself in terms of long-term development that balances financial, human, and environmental goals. This study will focus in-depth on how sustainable practices impact the firm performance in petrochemical industries by focusing on the aspects of workplace health and safety, environmental management, and good corporate governance (Figure 2.1). This is also a model adapted

from the ACSI framework (ACSI 2011).

Figure 2.1 Conceptual Framework on Impact of Sustainable Practices towards Firm Performance in the Malaysian Petrochemical Industry, as adapted from ACSI framework (ACSI 2011).



2.6 Hypothesis Development

2.6.1 Hypothesis 1 – Workplace health and safety practices have a positive relationship with firm performance among Malaysian petrochemical-related companies

The Institution of Chemical Engineers (ICChemE) developed a framework called Sustainability Metrics for the petrochemical industries to record and measure their progress toward sustainability, which is quite similar to the triple bottom line concept. Job conditions, societal effects, and health and safety at work are among the social indicators being measured (Vijayalakshmi, 2016). According to Al Sharrah et al. (2010), safety and health are embedded in all three key components of sustainability, including environmental concerns when considering human toxicity, economics when considering health and safety spending, and social indicators when aligning to work satisfaction. According to Vijayalakshmi (2016), the types of indicators tracked on occupational, health, and safety through research on Malaysia's petrochemical sectors include employee engagement in safety committees, injury rates and associated parameters, and training. The petrochemical industry gives prominent employee-related indicators akin to the oil & gas industry as they are closely related (Wolf, 2005).

On the positive side, through the research done by Amacha & Dastane (2017), analysis of Malaysian oil and gas companies demonstrated good safety and health practices across the industry, and this in turn also relates to good financial performance by the companies.

2.6.2 Hypothesis 2 - Environmental management practices have a positive relation on firm performance amongst Malaysian petrochemical-related companies

Following the GRI 3.1 Category on environmental indicators monitored by the petrochemical industries in Malaysia, Vijayalakshmi (2016) concluded that the 30 participating companies monitored 90 per cent of the total indicators, which included aspects such as materials, water, waste, effluent, biodiversity, and environmental accounting. Unlike the Malaysian study, a similar study of the same environmental indicator for 41 petrochemical manufacturing facilities in Thailand found that only half of the indicators are monitored, with the study citing a general lack of awareness and experience in GRI 3.1 reporting among those facilities as reasons (Chindavijak et al., 2015).

Multiple elements, including an organisation's field of operations, governance processes, performance level, and regulatory framework, may influence its willingness to disclose information about climate performance. However, a company's decision to disclose its climate-management performance does not necessarily reflect a genuine commitment to sustainable development; according to legitimacy theory, such disclosure may also be a response to external pressure (Talbot & Boiral, 2015). According to Amacha and Dastane (2017), most of the Malaysian oil and gas companies in their sample were lacking in climate-change management and environmental efficiency. Climate-related information appears to be increasingly material to stakeholders, including investors, as reflected in the attention paid to climate strategy reporting by major investors such as the Norwegian sovereign wealth fund and BlackRock (Dahl & Flottum, 2019). In the past, environmental regulations were often viewed as forcing businesses to deploy resources such as labour and capital to reduce pollution, which was considered inefficient from a business standpoint despite producing environmental benefits for society (Cucchiella et al., 2017). However, contemporary thinking has shifted this paradigm. An empirical study of 98 companies in the Chinese manufacturing sector using an integrated structural equation model found that green technology adoption had positive effects on economic performance and improved social reputation by meeting stakeholders' expectations (Xia et al., 2015).

The Resource-Based View (RBV) theory states that a company's competitive strategy and performance are strongly influenced by its valuable, rare, and inimitable organisational resources (Barney, 1991). According to the RBV, environmental management can help organisations develop competences such as cost reduction, improved corporate image, and increased employee morale, which can contribute to competitive advantage (Lannelongue et al., 2017). Compared with a single or limited set of environmental management practices, diverse environmental management techniques are more likely to support the development of distinct organisational capabilities and thereby improve company performance (Schaltegger and Synnestvedt, 2002).

2.6.3 Hypothesis 3 - Good corporate governance practices have a positive relation on firm performance amongst Malaysian petrochemical-related companies

The majority of Malaysian oil and gas companies had excellent levels of involvement in sustainability issues such as corporate governance, whistleblowing policy, code of conduct and ethics, and other aspects of economic and social sustainability were also found to be relatively good, according to an analysis done among Malaysian oil and gas companies on sustainability involvement and disclosure (Amacha & Dastane, 2017). In a study, Janggu et al. (2014) concluded that when determining the composition of the board, some key board characteristics, particularly board size, board professionalism, and board designation, should be taken into account to improve sustainability performance and, ultimately, the social role of organisations. Through his research, Vijayalakshmi (2016) identified that the three core indicators listed under Corruption and one aspect under Compliance are monitored fully indicating the emphasis the petrochemical industry accords to these matters on governance.

A good corporate governance structure allows for proper management oversight, accountability, and review of sustainability practices (Thomas et.al, 2020). Disclosure of governance body information such as board responsibilities, board composition, remuneration, audit committee, internal controls, risk management, general meetings, and communication with stakeholders is considered essential in managing opportunities and risks related to the environment, economy, and society. According to Fama and Jensen (1983), boards with a larger number of independent directors can exert greater influence over managerial decisions. Hence they hold a higher influence over the quality of sustainability reporting. Brown and Caylor (2004) discovered that companies with better management are more profitable, and valuable, and pay out more cash dividends to shareholders.

Though more than 2,000 studies have examined ESG (Environmental, Social, and Governance) and financial performance (Friede et al., 2015), there are still significant doubts about the role of ESG in shaping both profitability and firm value, while also taking Malaysia's perspective into account, as the indicator's introduction in Bursa Malaysia is still novel (Azhar, 2020). There were numerous studies in the past to prove that sustainability reporting does improve financial performance but lacking in theories to support the relationship (Johari & Komathy, 2019). Thomas et al. (2020) analysed the correlation between ESG performance against a couple of financial metrics, and observed a few financial variables showing lower performance to ESG score which was contrary to expectations but acknowledged this could be since sustainable reporting practices are still in the infancy stage in Malaysia. Despite this, when Malaysian oil and gas companies' financial performance is measured over time, it can be stated that Malaysian oil and gas companies that reported their sustainability involvement and practices performed significantly better than those that did not (Amacha & Dastane, 2017).

METHODOLOGY

Data Collection Method

A questionnaire survey was used to collect primary data for this study. The survey was based on the FTSE Russell ESG Index adopted by Bursa Malaysia, which comprises the three pillars of environment, social, and governance (FTSE Russell, 2021). Selected relevant questions were included in the survey to link the instrument to the chosen independent variables, and the instrument was validated by specialists during the pilot test. A five-point Likert scale was used, with 1 representing strongly disagree and 5 representing strongly agree.

Data Instruments

An electronic questionnaire administered through Google Forms was used in this study. A self-administered format was selected because respondents could understand and answer the questions without a trained interviewer (Hair et al., 2007). The questionnaire took approximately 15 to 20 minutes to complete.

The questionnaire was designed to collect data aligned with the research objectives, hypotheses, literature, and study constructs (Churchill & Iacobucci, 2006). Its design therefore focused on ensuring that each item contributed directly to answering the research questions. The suitability and reliability of the instrument were subsequently assessed during the pilot test and reliability analysis.

Sample Size and Sampling Method

The survey was confined to Malaysian practitioners in the petrochemical and allied industries. Senior executives in charge of the company's operations, technical services, sustainability, or health, safety, and environment (HSE) departments were formally contacted via text message, email and, where necessary, a telephone call or message to solicit their participation.

After agreeing to participate, respondents were provided with the relevant online survey link through Google Forms, where the questionnaire was administered. Some participating facilities were owned by the same parent company and included both Malaysian corporations and multinational corporations (MNCs).

In this study, a systematic sampling approach was deployed. Forty petrochemical-related organisations were assessed, with a minimum of three respondents from each organisation drawn from the targeted functional areas. The sample included Bursa Malaysia-listed corporations and organisations registered with the Malaysian Petrochemical Association (MPA) or its associates. The Small Sample Technique proposed by Krejcie and Morgan (1970) was used to identify an effective sample size for representing the population. The survey ultimately generated 151 responses, providing a larger sample and strengthening the study.

DATA ANALYSIS

Demographics Profile

Table 4.2 presents the profile of respondents which comprise gender, age, race, educational level, occupation, department, organizational tenure, workplace location, number of employees in the organization, and organizational ownership type. Data were collected from respondents who are employees in petrochemical-based companies in Malaysia. The unit of analysis is organization. Respondents represent their organization in performing the data administration.

Table 4.2 Demographic profiles (n=151)

Demographics	Frequencies	Percentage (%)
<i>Gender</i>		
Male	122	80.8
Female	29	19.2
<i>Age</i>		
30 and below	22	14.6
31- 40	60	39.7
41 -50	47	31.1
51-60	18	11.9
61 and above	4	2.6
<i>Race</i>		
Malay	91	60.3
Chinese	22	14.6
Indian	24	15.9
Others	14	9.3
<i>Education Level</i>		
PhD	2	1.3
Master Degree	45	29.8
Bachelor Degree	65	43.0
Diploma	27	17.9
Secondary	12	7.9
<i>Occupation</i>		
CEO/Managing Director	4	2.6
General Manager/ HOD	10	6.6
Senior Manager	13	8.6
Manager	50	33.1
Executive/ Engineer	58	38.4
Others	16	10.6
<i>Department</i>		
Health Safety & Environment	60	39.7
Operations	53	35.1
Technical Services	38	25.2

<i>Tenure in the organization</i>		
Less than 5 years	6	4.0
5-10 years	12	7.9
11-15 years	9	6.0
16-20 years	13	8.6
More than 20 years	111	73.5
<i>Working Experience</i>		
Less than 5 years	54	35.8
5-10 years	42	27.8
11-15 years	26	17.2
16-20 years	14	9.3
More than 20 years	15	9.9
<i>Location of Company</i>		
Selangor	28	18.5
Terengganu	4	2.6
Kuala Lumpur	37	24.5
Kedah	1	0.7
Johor	8	5.3
Sarawak	16	10.6
Negeri Sembilan	42	27.8
Pahang	5	3.3
Sabah	5	3.3
Perak	1	0.7
Others	4	2.6
<i>Employees (Size of Firm)</i>		
5-99	27	17.9
100-199	12	7.9
200 – 499	46	30.5
More than 500	66	43.7
<i>Ownership Type of Petro-chemical firm</i>		
Public listed company	55	36.4
Government link company	17	11.3
Private Foreign company	36	23.8
Private local company	32	21.2
Joint venture company	11	7.3

According to the table, more than 80% of respondents were male, while approximately 20% were female. Respondents were drawn from the Operations, Technical Services, and Health, Safety and Environment departments of the participating enterprises. Most respondents were between 31 and 50 years old. Malays accounted for 60% of respondents, while Chinese and Indian respondents represented broadly similar proportions, and other ethnic groups accounted for 14%. In terms of highest education level, 43% held a bachelor's degree and 29% held a master's degree.

According to the position level of respondents, 33% are managers and 38% are executives. The scope of this study was covered by data obtained especially from respondents

in the Health, Safety & Environment (39.7%), Operations (35.9%), and Technical Services departments. Remarkably, the majority of responders (73.5%) have been with their current employer for more than 20 years. This has the effect of giving a solid and well-defined respond to the data collected. Except for Perlis, Kelantan, and Melaka, data was obtained from practically every state in Malaysia. 43.7 per cent of petrochemical-based organisations have more than 500 employees, putting them in the medium company category, while 56.3 per cent of respondents work for smaller businesses. As a result, the data collection includes multiple-sized organisations related to the petrochemical sector.

Descriptive Analysis

Table 4.3 Descriptive Analysis (n=151)

Variable	Mean	Standard Deviation
Firm Performance	4.63	4.51
Work Health & Safety	3.22	3.60
Environmental Management	4.14	4.30
Good Corporate Governance	3.40	3.45

Table 4.3 presents the reported mean and standard deviation for each variable derived from the descriptive analysis. Firm performance recorded M = 4.63 and SD = 4.51. Among the independent variables, workplace health and safety recorded M = 3.22 and SD = 3.60; environmental management recorded M = 4.14 and SD = 4.30; and corporate governance recorded M = 3.40 and SD = 3.45. Environmental management had the highest reported mean among the independent variables. Because the questionnaire used a five-point Likert scale, the standard-deviation values should be verified against the statistical output before the results are interpreted.

Reliability Test

The internal consistency of the four main variables and their 35 sub-items was examined using a reliability test. Cronbach’s alpha reliability coefficient ranges from 0 to 1. According to Gliem and Gliem (2003), the closer the Cronbach’s alpha coefficient is to 1.0, the stronger the internal consistency of the scale items. Mallery and George (2000) provide the following rule of thumb: $\alpha > .9$ = excellent, $\alpha > .8$ = good, $\alpha > .7$ = acceptable, $\alpha > .6$ = questionable, $\alpha > .5$ = poor, and $\alpha < .5$ = unacceptable. The reliability coefficients for the items used in the study are shown in Table 4.4. As shown, all constructs recorded Cronbach’s alpha values above the recommended threshold of 0.60 (Hair et al., 2010).

Table 4.4 Reliability Coefficient for items in the study (n=151)

Variable	Number of items	Cronbach's Alpha (n=151)
Workplace Health & Safety	9	0.745
Environment Management	11	0.952
Good Corporate Governance	10	0.918
Firm Performance	5	0.914
Total	35	

4.6.1 Correlation Analysis

Pearson correlation analysis was used to measure the strength and direction of the linear relationship among the variables. Table 4.5 illustrates the correlation coefficients for the variables used in the study. The results show significant relationships between workplace health and safety, environmental management, good corporate governance, and firm performance. Workplace health and safety was positively correlated with firm performance ($r = .331$), environmental management was positively correlated with firm performance ($r = .491$), and good corporate governance was positively correlated with firm performance ($r = .406$).

Table 4.5 Correlation among Variables

	Workplace Health & Safety	Environment	Corporate Governance	Firm Performance
Workplace Health & Safety	1.000			
Environment	.589**	1.000		
Management Corporate Governance	.618**	.789**	1.000	
Firm Performance	.331**	.491**	.406**	1.000

Environmental management and firm performance were moderately correlated, $r(147) = .491$, $p < .001$. Workplace health and safety and firm performance were also positively correlated, $r(147) = .331$, $p < .001$, while corporate governance and firm performance were moderately correlated, $r(147) = .406$, $p < .001$. These effect sizes were interpreted using Cohen's (1988) conventions (Sullivan & Feinn, 2012). The p-values indicate that the observed associations would be unlikely under the null hypothesis; they do not represent the probability that the correlations are true.

There is sufficient evidence to conclude that there is a significant relationship between environment management and firm performance because the correlation coefficient is significantly different from zero. Also, sufficient evidence is present to conclude that there is a significant relationship between corporate governance and firm performance because the correlation coefficient is significantly different from zero. And consistently, there is sufficient evidence to conclude that there is a significant relationship between workplace health and safety, and firm performance because the correlation coefficient is significantly different from zero.

Regression Analysis

To test hypotheses, predictive analysis was conducted using multiple linear regression. This is to describe the data and explain the relationship among the variables.

Table 4.6 Model Summary, ANOVA and Coefficient

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.494a	.244	.229	3.95992	1.944

a. Predictors: (Constant), SPGCG, SPWHS, SPENV

b. Dependent Variable: FP

Regression analysis is commonly used in research to analyze relationships between independent variables and dependent variables. In this study, R2 value is 0.244 which comprises 24.4 % of the variances of firm performance that can be predicted from the independent variables. This indicates the strength of the relationship by indicating the goodness of fit. Based on the F-test the model indicates it is statistically significant.

ANOVA^a

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	743.867	3	247.956	15.813	.000b
1. Residual	2305.100	147	15.681		
Total	3048.967	150			

a. Dependent Variable: FP

b. Predictors: (Constant), SPGCG, SPWHS, SPENV

The regression equation has predictive power if the f-ratio is significant, indicating that there is at least one statistically significant variable in the model.

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1	(Constant)	7.312	2.470	2.961	.004
	SPWHS	.056	.091	.618	.538
	SPENV	.212	.058	3.660	.000*
	SPGCG	.016	.074	.213	.832

a. Dependent Variable: FP (firm performance)

b. Independent Variable: Sustainable Environment (SPWHS), corporate governance (SPGCG), workplace safety and health (SPWHS)

In this study, the firm performance was regressed with sustainable practices of workplace health and safety, environmental management and good corporate governance. The result of the regression analysis is shown in Table 4.6 of the Coefficient Table.

Firm performance = 7.312 + 0.056(workplace health and safety) + 0.212(environmental management) + 0.016(corporate governance).

The regression results indicate that environmental management significantly predicted firm performance, $t = 3.660$, $p < .001$. The model explained 24.4% of the variance in firm performance, $R^2 = .244$, adjusted $R^2 = .229$, $F(3, 147) = 15.813$, $p < .001$.

The F ratio indicates that the regression equation has predictive power and that at least one variable in the model is statistically significant. The ANOVA table shows that environmental management significantly predicts firm performance. The positive coefficient indicates that, for every one-unit increase in environmental management, firm performance increases by 0.212 units. The analysis therefore suggests that environmental management has a positive impact on firm performance. In contrast, workplace health and safety is not statistically significant because its p-value (.538) is greater than the 0.05 significance level. Corporate governance is also not statistically significant because its p-value (.832) is greater than 0.05.

Table 4.7 Hypothesis Result

Hypothesis	Analysis	Result
H1: Workplace Health and Safety practices have a positive relation on firm performance amongst Malaysian petrochemical-related companies	Pearson Correlation	Supported

Hypothesis	Analysis	Result
H2: Environmental Management practices have a positive relation on firm performance amongst Malaysian petrochemical-related companies	Pearson Correlation	Supported
H3: Corporate Governance practices have a positive relation on firm performance amongst Malaysian petrochemical-related companies	Pearson Correlation	Supported

The hypothesis results depend on the inferential test used. Pearson correlation analysis supported positive bivariate relationships between workplace health and safety, environmental management, corporate governance, and firm performance. In the multiple regression model, however, only environmental management significantly predicted firm performance; workplace health and safety and corporate governance were not statistically significant predictors. The next section discusses these findings and their implications.

DISCUSSION

Workplace Health and Safety practices and firm performance in the context of Malaysian Petrochemical-related companies.

One objective of this study was to examine the relationship between workplace health and safety practices and firm performance. Findings from the Pearson correlation analysis support the first hypothesis, which states that workplace health and safety practices have a positive relationship with firm performance among Malaysian petrochemical-related companies. According to Agboola et al. (2020), there is growing evidence that creating a healthy and safe work environment can raise labour productivity by improving worker satisfaction, reducing labour turnover, encouraging employees to take responsibility for their own safety and that of others, and increasing business profits. A study in Turkey, supported by the European Agency for Safety and Health at Work, also found a positive relationship between safety-prevention costs and employee satisfaction (Bayram et al., 2016). Both studies support the argument that investment in occupational health and safety generates positive returns. Malaysia has made considerable progress in this area since the launch of the Occupational Safety and Health Act 1994, although its practices may still lag behind those of the United States, Europe, and some Asian countries such as Japan and Singapore. Nonetheless, safety practices have become widespread across Malaysian industries and are no longer limited to high-risk sectors. This is evident in companies' increased participation across industries in voluntary annual safety awards such as those organised by the Malaysian Society for Occupational Safety and Health (MSOSH) and the National Council for Occupational Safety and Health (NCOSH), where firms are recognised for good practices beyond legal compliance.

On a different note, negative workplace safety events or accidents can deeply impact an organisation's financial performance and the magnitude of this impact is significantly greater today compared to before, indicating the challenging reality of today's workplace environment (Kabir et al., 2018). Major hazard incidents such as the explosion in the southern region, Pengerang Integrated Complex jointly owned by Petronas and Saudi Aramco which killed five people have since delayed the start-up of the refinery, and these are causing a lot of financial losses on top of the reputational impact not just to local communities but also to the global community noting these are big major oil and gas players known worldwide (Aziz, 2020). In 2021 alone, there were three separate explosions which happened at biodiesel plants, two of them in Malaysia and one in Sumatra, Indonesia all resulting in a fatality. These incidents happened during welding hot work activity and the main suspect was the presence of highly flammable methanol in the atmosphere when the work was carried out (Qua, 2021). Tragedies as such strengthen the need for good safety controls, practices and culture within an organisation, and the expectation deepens especially for high-risk industries such as petrochemicals where lapses in workplace safety can be catastrophic.

Environmental management practices and firm performance amongst Malaysian petrochemical companies

Another objective of this research was to examine the relationship between environmental management practices and firm performance in the Malaysian petrochemical-related industry. The findings show a strong and significant relationship between environmental management and firm performance among the sampled companies, and this is a key outcome of the study. Both inferential analyses, Pearson correlation and multiple regression, support Hypothesis 2, which states that environmental management practices have a positive relationship with firm performance among Malaysian petrochemical-related companies.

The findings here are consistent with another study done by Hirunyawipada and Xiong (2018), thru a study analysing 376 organisations which supported the significance of environmental commitment in improving firms' financial performance, measured by Return on Assets (ROA) and long-run financial performance measured using Tobin's Q. Supporting that, Tang et al. (2018) looked into the effects of green innovation on firm performance. The results of the study, which used a sample of 188 Chinese manufacturing enterprises, revealed that green innovation, in the form of product and process innovation, has a considerable positive impact on a firm's performance.

Another significant study done previously was to assess the linkage between environmental accounting, the environment, management, and firm performance. Environmental accounting plays a critical role in assessing a company's impact on the environment through a variety of channels. It aids the organisation in calculating environmental costs

and enhances the environmental disclosure procedure. Running the PLS-SEM, it was evident through the results gathered, that green innovation and environmental commitment are key contributors to enhancing firm performance amongst Indonesian multinational firms. Recommendations from that study suggest that policymakers use a green approach to boost their innovation processes, such as introducing green purchasing and green payment principles. In addition, management must inspire and motivate employees to work in a sustainable and environmentally friendly manner, as well as strengthen their environmental commitment (Somjai et al., 2020).

One key factor driving environmental commitments in Malaysia was also the development of a legal framework, following suit from legislative changes in more developed countries. Amendments to the Environmental Quality (Clean Air) Regulations 2014 and the introduction of the Environmental Professional Certification Program in 2016, are some of those requirements put in place which has elevated the expectations of industries on environmental management and compliance. Some required significant investments amounting to multi-millions of capital investments such as the installation of Continuous Emission Monitoring Systems (CEMS), and fixing of scrubber systems for pollution control and some, especially for petrochemical refineries may also include the installation of new processing units such as the Hydrogen Desulphurisation and Hydrogen Generation Units, as per the case with Hengyuan Refining Company (New Straits Times, 2019). Such legal measures are considered bold moves for governments especially in developing countries, as it may seem unfavourable for investors noting the high cost of compliance. On the other hand, for employees and the community at large, it signifies that the company is serious about managing the environment and operating as a responsible corporate citizen. There is also increased environmental awareness in today's community as compared to before. The public is acknowledging the impacts of climate change especially global warming, based on real impacts they're seeing nowadays such as prone flooding and prolonged drought seasons. This has put pressure on governments and major polluters such as oil & gas and petrochemical sectors, to take on more affirmative actions, beyond just the traditional corporate social responsibility (CSR) activities where some are seen to just project a good image for the company.

Previous studies support this study's findings on the relationship between the three selected sustainable practices, which represent the broader environmental, social, and governance (ESG) spectrum. However, environmental management practices stood out as the variable with the most significant impact on firm performance when compared with workplace health and safety and good corporate governance. This suggests that organisations seeking incremental improvements in firm performance should give particular priority to environmental management practices.

Good corporate governance practices and firm performance in the context of Malaysian petrochemical-related companies.

The last objective of this study was to examine the relationship between good corporate governance practices and firm performance in the context of Malaysian petrochemical-related companies. According to the results of the Pearson analysis, there is a moderately significant relationship between good corporate governance procedures and business performance among these companies.

There were mixed outcomes on previous studies done, assessing this relationship between corporate governance and firm performance. In a study, Ciftci et al. (2019) discovered that enterprises perform better when ownership is concentrated, which is often held by a few significant families. A high concentration of ownership encourages families to work together to improve firm performance. The same study amongst Turkish firms established that larger boards also performed better as they provided professional managers more latitude in exercising their judgement, allowing for more room for new ideas. They would also mean that there is more room inside the dominant family to accommodate diverse interest groups, bring in extended kin, and provide access to a larger reservoir of knowledge and, possibly, a wider range of personal and familial networks. According to Naimah and Hamidah (2017), the number of audit committee sessions and the quality of audits conducted, have a considerable positive impact on profitability. Analysis of sample listed companies (as listed in the Indonesia Stock Exchange) participating in the Corporate Governance Perception Index (CGPI) also showed that corporate governance principles have a strong positive impact on profitability. However, board independence and involvement of outside directors do not significantly affect firm performance, which is consistent with the earlier study's discovery.

Closer to Malaysia, Abdulsamad et.al., (2018) investigated the influence of board characteristics such as CEO duality, independent directors, board size and board meetings, on firm performance. Using purposive sampling, data were collected from 341 Malaysian public-listed companies, and the results were mixed. Board meetings, for example, had weak and negative effects on company performance, but independent directors only had weak and positive effects on ROA. The data collected representing the period from 2003 to 2013 could be seen as outdated if compared to the development of corporate governance practices advocated through the Securities Commission and Bursa Malaysia actively over recent years. However, another study done by Jakpar et.al, (2019) was also consistent where it concluded that components of corporate governance such as board size, and proportion of independent and non-executive directors (NEDs) have a negative relationship with firm performance.

On a more positive note, a study done recently investigating the impact of corporate governance on firm performance during the COVID-19 pandemic churned better results. The size of the board of directors is the only governance tool that has a significant positive impact on business success, based on a regression analysis conducted (Khatib & Nour, 2021). Another interesting outcome, during the Covid-19 pandemic, board gender diversity appeared to improve business performance, measured through financial metrics Return on Assets (ROA) and ROE). A useful explanation offered, that the benefits of diverse insight, expectation, knowledge, and background are more helpful to corporations as they navigated through uncharted waters for survival during the pandemic.

Malaysia has made substantial progress since the global 1MDB scandal, with governance standards tightened across multiple regulatory sectors. The National Centre for Governance, Integrity and Anti-Corruption (GIACC), under the Prime Minister's Department, launched the National Anti-Corruption Plan 2019–2023. The Malaysian Anti-Corruption Commission subsequently introduced a corporate liability law prohibiting corruption and dishonest commercial misconduct. These milestones demonstrate the government's commitment to strengthening integrity culture. The most recent revision of the Malaysian Code on Corporate Governance (MCCG) has also advanced key requirements, including advocacy for 30% women directors, discouragement of politicians holding board seats, prohibition of the chairman's involvement in board committees, and clearer expectations for board oversight of sustainability (Securities Commission, 2021). More companies are also taking proactive steps, such as setting up independent whistleblowing channels and adopting ISO 37001:2016 Anti-Bribery Management Systems, as they continue to strengthen governance practices.

The findings show a positive correlation between good corporate governance and firm performance, $r = .406$. This coefficient indicates the strength and direction of the bivariate association; it does not mean that a 1% increase in governance practices produces a 40.6% increase in firm performance. In the multiple regression model, corporate governance was not a statistically significant predictor when the three sustainable-practice dimensions were considered together.

CONCLUSION

This study addressed its objectives and research questions by examining the impact of sustainable practices on firm performance among Malaysian petrochemical-related companies. Pearson correlation analysis showed positive relationships between workplace health and safety, environmental management, corporate governance, and firm performance. The multiple regression results were more selective: environmental management was the only statistically significant predictor, while workplace health and safety and corporate governance were not significant when the three dimensions were considered together.

Environmental management therefore stood out as the most influential component in the model, suggesting that organisations may benefit from placing greater emphasis on this area to improve firm performance. Further research could strengthen and extend these insights.

RECOMMENDATION FOR FUTURE RESEARCH

This study was conducted with a special focus on sustainable practices amongst Malaysian petrochemical-related companies, covering various kinds of organisations such as private and government-linked. It aimed to go beyond the norm of typical oil and gas industry focus, or a much broader, general public-listed companies. Various other industries can be of research interest such as plantation, manufacturing, tourism and financial-related businesses which are also key industries in Malaysia. The study can also be expanded perhaps to the larger ASEAN and Asian region context, to assess any correlation and consistency.

As a method of data collection deployed in this study, the researcher only used an online survey questionnaire as the chosen method. Other methods such as secondary data analysis through annual and sustainability reports can be explored as more organisations are demonstrating reporting transparency now as compared to before. Other means may include observations and interviews. Lastly, the researcher also recommends a larger sample size involving more companies in future studies to obtain better results.

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