

Effects of Environmental and Social Disclosures Practice on Firm Risks: Evidence From a Developing Nation

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Abstract: The purpose of this study is to explore the effects of environmental and social disclosures (ESD) on firm risk in Malaysia. The study utilises stakeholder theory because it explains the responsibilities of the firms towards the wide range of stakeholders that will then contribute to the economic performance of the firms and it has been widely used by researchers in corporate social responsibility studies. The data were collected through content analysis. The extent of ESD was obtained from the annual reports and sustainability reports for the year 2017, while the firm risk was calculated based on the share prices obtained from Bursa Station. The finding indicates the level of ESD is still low among the top 100 listed companies in Malaysia and the result from the hypotheses testing found the relationships between ESD with specific firm risks (total risk, systematic risk, unsystematic risk) are insignificant. The discovery infers investors have minimal demands and reliance on ES information of the country's public listed companies in making financial-related decisions. Apart from investors, other company's stakeholder groups also may not value the importance of ES-related activities including ESD. Nevertheless, this study provides an insight for (i) the regulators namely the government and Bursa Malaysia that continuous initiatives should be performed on ESD guidance and (ii) the companies on the need for new strategies towards a successful implementation of ESD.

Keywords: sustainability reports, CSR practices, Prevailing literature.

1. INTRODUCTION

Corporate social responsibility (CSR) has rapidly become a worldwide phenomenon and companies are increasingly engaged with this form of activity. Prevailing literature has identified numerous reasons behind such corporate practices; which include institutional pressures (Fernández-Kranz & Santaló, 2010) competitive advantages (Sarhan & Al-Najjar, 2022; Siegel & Vitaliano, 2007) and other social and environmental-related causes (Hawn & Ioannou, 2016; Zaman, Jain, Samara, & Jamali, 2022). The financial crisis in the United States that happened between 2008 and 2009, for instance, has driven the local CSR practices amongst business corporations in the country. The crisis has signified the importance of the practice in enhancing stock returns, profitability, growth and sales per employee relative to low-CSR firms (Lins, Servaes, & Tamayo, 2017). Despite the high corporate engagement on CSR, it is still debatable whether the initiatives have the potential to stimulate the connection between company and stakeholders, and if so, whether the CSR initiatives can contribute to greater corporate performance.

Based on the Malaysian scenario, the national aim towards being a developed and high-income economy imposes greater role amongst business corporations in contributing

towards economic growth, and instantaneously conduct their operation and management efficiently and effectively without neglecting their responsibilities towards the environment and society. The national aim will not be fully achieved if businesses continue to act unethically that impose negative impacts on the natural environment and the welfare of the society. Amongst the most common issues in the country are the pollution of the air and water caused by business operation (Department of Statistics Malaysia, 2018). The pollution is commonly caused by insufficient handling of sewage or effluent from agricultural and manufacturing industries, animal farming and domestic sewage, as well as improper earthworks and land clearing activities. Apart from the environmental problems, Malaysia has also suffered from social problems such as poverty and crime (Hew, Low, Goh, & Lau, 2020).

Consequently, business corporations which are deemed as the corporate citizens are expected to support and contribute together with the government in tackling these problems. The pursuit of effective CSR implementation can be achieved through various sustainable forms of practices, namely (i) social-related activity such as providing job opportunities with well-paid salaries to the society which will help in eradicating poverty as well as philanthropic activities in helping the community, and (ii) environmental management and practice which supports reduction in carbon emission, proper management of waste and effluent, habitat change and water pollution (Adekomaya, Jamiru, Sadiku, & Huan, 2016; Hertwich, 2010). These practices followed by

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transparent and extensive disclosures in their public reports are the optimum practice expected from companies. Quality CSR practice is to be able to illustrate the impacts of both the environmental and social aspects of the business. These practices may attract greater consumerism and market supports to the companies, and accordingly will boost corporate reputation and attract more investments, thus heighten the organizational value.

Companies also need to respond appropriately on any negative impacts as they may become a reputational risk as stakeholders are now more aware of the impact of businesses especially on the environment and society, which will subsequently affect the company's ability to obtain funding, avoid risk profile, overcome potential liabilities, and ascertain the firm's value. Previous studies in Malaysia that examined environmental and social disclosure (ESD) found low practices (Anas, Rashid, & Annuar, 2015; Yusoff, Darus, & Rahman, 2015; Zainon et al., 2020) and general or qualitative in nature (Md Zaini, Sharma, Samkin, & Davey, 2020; Sumiani, Haslinda, & Lehman, 2007). Over the years, ESD practices in the country have improved, as the KPMG survey in 2017 highlighted that Malaysia was in the top quartile for the overall reporting rate. Yet, disclosures relating to environment are rather minimal in terms of acknowledging the climate risk and human rights, setting carbon target, and linking the corporate responsibility to the Sustainable Development Goals (SDGs). Various reasons can be linked to such level of disclosure practices; among others are companies' unwillingness to invest in CSR and sustainability activities due to cost factors. According to Chen and Lee (2017) the investment in CSR will initially incur some opportunity costs to the companies, but will not give them immediate benefits. However, the continuous effort will then be recognised by the consumers once it has exceeded a certain threshold and that will benefit the companies in terms of increased business reputation and operational performance.

Based on the key issues highlighted and the findings from the existing literature, this study seeks for the effects of ESD on the firm risk of PLCs in Malaysia. Such research aim is crucial to investigate the relevant approaches for companies to practise ESD towards facilitating stakeholders, especially investors, to be able to assess the relevant business risks. Accordingly, this study intends to examine the effect of ESD on the firm risks of Malaysian PLCs which involve total risk, systematic risk and unsystematic risk.

The expected contributions of the study findings will be two-fold; namely, the identification of the specific effect of ESD on the firm risks from a local context and the corporate strategy to increase the value of the firm from effective implementation of ESD practices.

2. REVIEW OF LITERATURE

2.1. Measuring Firm Risk

Firm risk is a crucial aspect to be assessed by firms as it measures fluctuations in performance over time (Donaldson, 1999), thus it determines the ability to sustain economically in the future.. Greater risk as implied by increased firm stock price volatility may suggest vulnerable and uncertain future

cash flows. Generally, the primary reasons that demand for the assessment of firm risk are:

1. A high level of firm risk impairs firm's forecasting and planning activities (Bettis & Thomas, 1990).
2. It indicates an increased variability in the firm's return, thus firm's growth.
3. It increases the chance of corporate decline and mortality (Baird & Thomas, 1985; Miller & Bromiley, 1990).

In general, firm risk can be defined as the possible reduction in the firm's value due to the uncertainty of future outcomes or events (Chang, Kim, & Ying, 2014; Valipour, Amin, Kargosha, & Akbarpour, 2015). It also arises due to the internal and external factors that affect a firm's profitability that are inherent to the firm's operation (Park, Song, & Lee, 2017). It can be measured by analysing the fluctuation in the firm's financial performance, and it is called market risk or accounting risk (Chang et al., 2014; Orlitzky & Benjamin, 2001). Market risk is one that is reflected by the movement in the share price while accounting risk can be reflected by the coefficient of variation of return on invested capital, the percentage of a firm's total or long-term debt relative to assets, or the standard deviation of a firm's long-term return on assets or return on equity (Orlitzky & Benjamin, 2001).

The capital asset pricing model (CAPM) categorizes the total market risk into two types of risk; namely, systematic risk and unsystematic risk (Luo & Bhattacharya, 2009; Park et al., 2017). Systematic risk represents a firm's sensitivity to broad market movements or changes that are relevant to all stocks (Luo & Bhattacharya, 2009; Park et al., 2017; Sharpe, 1964). This risk reflects the covariance of a firm's stock return with the market or the sensitivity of a stock return to market trends, such as adjustments in exchange or interest rates and changes in energy prices. Unsystematic risk is specific to the firm (Luo & Bhattacharya, 2009; Park et al., 2017) and cannot be explained by broad market movements. It reflects the variability in a firm's stock return caused by firm-specific events, such as poor management, workers' strike or product defects. While unsystematic risk can be eliminated by a well-diversified portfolio, market-related systematic risk cannot be diversified away (Kim, Gu, & Mattila, 2002; Rego, Billett, & Morgan, 2009).

2.2. Environmental and Social Disclosures (ESD)

Malaysia has taken the regulatory approach for ESD practices amongst the listed companies. Since 2007, Bursa Malaysia has imposed mandatory reporting for Malaysian PLCs starting from the year 2007 to include community, workplace, employees, and the environment related information in their annual report. Then, Sustainability Reporting Guide was introduced in 2016 in which all PLCs are required to disclose about their material economic, environmental, and social risks and opportunities in the sustainability statement as prescribed by the annual reports issued for the financial year ended on or after 31 December 2016.

The introduction of the new guideline has prompted a shift to the strategies adopted by businesses. More quality forms of environmental and social information are expected to be disclosed. Incorporating environmental and social activities as

prescribed by the new guideline can benefit firms in three prime ways. First, ESD practice will enhance firm's initiative to analyse the impact of their business on the environment and society and vice versa. As firms are increasingly exposed to the environmental conditions and social changes, managing the risk will help in reducing the effect of such exposures. For example, if a firm considers the safety of its employees in the workplace, the firm's risk of worker strikes and the risk of being sued will be mitigated. The firm will not have to incur additional costs for the compensation and the legal cost. Investors will also favour firms that have high ESD, and they are more willing to invest in those firms as they are less risky. The ESD will enhance a firm's reputation, thus reduce the cost of capital.

Second, ESD will further facilitate investors' decision making. Nowadays, investors are no longer focusing solely on the financial performance, but also environmental and social performances. Therefore, the firms that practise ESD will have an advantage since they will be perceived to have better risk management and able to generate sustainable returns. Third, ESD practices will enhance employees' satisfaction and firm's productivity. For instance, in conducting health and safety programmes for employees, it prevents any incidents of injury or fatality at the workplace, this will then improve the employees' productivity. Employees will be able to work efficiently, and this will lead to long-term benefits such as customer retention and improved reputation. Employee satisfaction will also increase, and the firms can retain the top talents.

At large, firms can take the opportunity to innovate their business operation in a more sustainable way, hence sustain their economic performance. ESD practice potentially will provide competitive edge to firms as it facilitates the creation of long-term value.

2.3. ESD and Firm Risk

In recent years, numerous empirical research works have investigated the relationship between ESD and firm risk. Nonetheless, the research findings are largely inconclusive (e.g. (Cai, Cui, & Jo, 2016; Haryono, Iskandar, Paminto, & Ulfah, 2016; Hoje Jo & Harjoto, 2014; Hoje Jo & Na, 2012; Sun & Cui, 2014)). Majority of the empirical CSR-based research did not provide general consensus as to whether social performance is value enhancing, reducing, or irrelevant. Financial performance will only be affected by social performance if the social performance affects the expected future cash flows and/or risks (Bouslah, Kryzanowski, & M'zali, 2013).

Various past research found an inverse relationship between ESD and firm risk (Cai et al., 2016; Hoje Jo & Na, 2012; Luo & Bhattacharya, 2009; Orlitzky & Benjamin, 2001); which imply that an increase in ESD will reduce firm risk. Godfrey (2005) discovered environmental and social (ES) activities tend to reduce the systematic risk by functioning as an insurance-like protection for the firms. Shareholders' wealth can be raised, thus reflected on the share price of the company. The study specifically found that positive moral capital can be generated among communities and stakeholders through ES programmes. Moral capital can be in terms of

brand faith and credibility among customers, affective commitment among employees, legitimacy among communities and regulators, trust among suppliers and partners, and higher attractiveness and dependability for investors.

CSR has a significant and negative relationship with firm risk, which is represented by the total risk, systematic risk, and unsystematic risk. This negative link is possibly due to the key potential of ES activities that pertain to insurance-like protection, improving risk management, providing market appeal to customers, improving information transparency, or simplifying access to financial markets. In a further analysis of the components of ES, Cai et al. (2016) found controversial activities have a significant and negative relationship with the total risk and unsystematic risk. These findings indicate that there is an asymmetrical influence of ES on firm risk and firms should put their effort to engage in beneficial activities rather than focusing on reducing negative activities if they seek to reduce risk through CSR engagement.

ES activities contribute to reducing the systematic risk by enhancing a firm's image and reputation, especially among firms in controversial industries such as the alcohol, tobacco, and gambling industries (Hoje Jo & Na, 2012). ESD reduces a firm's risk due to its relevant association with the performance of company (Casado-Díaz, Nicolau, Ruiz-Moreno, & Sellers, 2014). Also, ESD has the power to increase financial performance and lower the cost of capital (El Ghoul, Guedhami, Kwok, & Mishra, 2011; Oikonomou, Brooks, & Pavelin, 2012). Investment in improving employee relations, environmental policies, and product strategies can substantially contribute to reducing firms' cost of equity, which subsequently lower the risk. Nonetheless, the situation is the opposite for the tobacco and nuclear power industries (El Ghoul et al., 2011). Therefore, the capabilities of ESD in reducing the firm risk in terms of total risk, systematic risk, and unsystematic risk as found in previous literature provide insights for this study to examine the link between ESD and firm risk of Malaysian PLCs. Such scope of research is yet new to Malaysia. Therefore, a study from a local context is essential to understand whether ESD is value enhancing, reducing, or irrelevant.

3. THE UNDERPINNING THEORY AND DEVELOPMENT OF STUDY HYPOTHESES

Stakeholder theory is often used to describe the relationship between environmental and social responsibilities (ES) and firm value, including the relationship between ES and firm risk. Practising ES will lead to fulfilling the demands and expectations of company's stakeholders. Stakeholders will act and make decisions that impact the well-being thus sustainable growth of the organization. A good corporate environmental and social performance may also be considered as a signal for superior management skills.

Investors will act accordingly to the positive news of ESD while negative information will lead to financial distress (Hsu & Chen, 2015). ES engagement can lower the capital constraint of firms since market participants are more willing to allocate capital to firms with high levels of ES. A firm's

reputation, brand value, and image can also be enhanced by better engagement in ES (e.g. (Taghian, D'Souza, & Polonsky, 2015)) which will lead to the reduction in the firm's level of risk. People are also more attracted to work for firms with a high level of ES, and it will eventually help the firms to retain high-quality employees that contribute to the value of the firms (Greening & Turban, 2000).

Based on the stakeholder theory, it is argued that ESD has an association with company's key stakeholders; which will then reflect in firm-specific resources, thus influencing the firms' unsystematic risk (see Mishra and Modi (2013)). The effect of ESD on the key stakeholders has also been supported by extensive research in marketing, organisational behaviour, and operations as unsystematic risk can exist due to such factors. A consumer will be more attracted to the product or service offered if the company demonstrates a positive attitude towards the environment and society, and vice versa. Thus, ES influences greater consumerism and lessen firms' unsystematic risk (Brown & Dacin, 1997; Sen & Bhattacharya, 2001). Firms' association and identification are thus essential components of a firm's brand equity.

From the context of organisational behaviour, social fairness in a workplace has a significant impact on employees' satisfaction, stress level, health and emotions (Colquitt, Conlon, Wesson, Porter, & Ng, 2001). Consequently, social disclosures are likely to influence the performance and productivity of employees (Aguilera, Rupp, Williams, & Ganapathi, 2007) which will then affect firm's level of unsystematic risk. Employees' level of performance and productivity are very crucial to the firm as they can directly influence future cash flows which consequently affect the firm's unsystematic risk. Mohr and Bitner (1995) suggested that satisfaction with the employer produces employees' behaviour that leads to higher levels of customer satisfaction.

ES practice is equally crucial for company's operation and its effectiveness. ES affects the relationship between firms and their supply chain partners (Carter, 2000) as it creates an important firm-level capability (Peng, Wang, & Jiang, 2008) which allows firms to counter unpredictable variations in demand and minimise the impact of supply chain disruptions (Hendricks & Singhal, 2003; Mishra & Modi, 2013). As such, positive (negative) ES and ESD can potentially lower (increase) the unsystematic risk of firms through better (weak) relationships with their supply chain partners.

In response to various stakeholders, firms' ability to fulfil enough ES information is anticipated as this may help firms identify and closely monitor ES-related risks, resulting in higher firm value that would affect stakeholders' interests (e.g. Naseem, Shahzad, Asim, Rehman, and Nawaz (2020)). Further, Wirawan, Falah, Kusumadewi, Adhariani, and Djakman (2020) indicate that firms are willing to disclose ES as it portrays good concern, commitment and supports towards social and environmental needs of the stakeholders.

As business environment evolves, the use of ES information in assessing firm risk would better address real challenges and impacts the essential for sustainable business. Empirically, the level of firm risk is found to be lower when firms provide good CSR report; in which similar finding was

found by Albuquerque, Koskinen, and Zhang (2019) and Naseem et al. (2020). Hence, this implies that firms that actively evaluate associated risks when performing ES activities and disclosure intend to signal that their commitment in enhancing firm performance during crisis period (also Chintrakarn, Jiraporn, and Treepongkaruna (2021)).

Taken together, these prevailing literatures suggest the relevance of stakeholder theory for this study to investigate the effect of ESD on firm risks.

3.1. ESD and Firm Risks (Total Risk, Systematic Risk, Unsystematic Risk)

Prior studies suggest that investors view socially irresponsible firms as having higher level of risks (e.g. (Ramli, Ismail, Ab Samad, & Zainon, 2019; Salama, Anderson, & Toms, 2011; Starks, 2009; Ezekiel & Obafemi, 2021; Attoukou & Nchare, 2022; Eniola et al., 2022)). The firms may face a lawsuit if they do not invest in product safety and sell an unsafe product, thus they will incur an additional cost for the lawsuit and the compensation if they are found guilty (El Ghoul et al., 2011). Hong and Kacperczyk (2009) further argued that the risks are higher for firms involved in producing alcohol, tobacco, and gaming. Hence, ESD practices are deemed essential with the socially responsible behaviour as perceived by investors. ESD is often associated with better financial performance and lower cost of capital (El Ghoul et al., 2011; Hoje Jo & Na, 2012; Oikonomou et al., 2012) thus have a significant and negative relationship with the total risk (Cai et al., 2016).

Previous studies also suggested that firms with strong environmental performance are less risky than peer firms with low environmental performance. Environmentally responsible actions help anticipate environmental upheavals and the financial market perceives firms as less risky if they pay attention to environmental issues, implement measures to save the environment, and inform the public about their effort to save the environment. However, Krüger (2015) found that investors react negatively to the ESD particularly regarding the environment. It means that investors are getting the signals that there will be a substantial cost associated with corporate social irresponsibility and that they might lose their money. Nevertheless, Krüger highlighted that under certain circumstances, improvements in a firm's ES may enhance shareholders' value. Evidence has demonstrated that investors tend to react more favourably on positive ES news disclosed if the agency cost is less likely to be present and it is likely to result from managerial efforts that are aimed at offsetting prior corporate social irresponsibility (Krüger, 2015). Such circumstances will be less risky to the investors, and there will be a negative relationship between ESD and firm risk. Therefore, based on the prevailing literature discussed above, the first and second hypotheses of this study are as follows:

H1: Environmental disclosures have a significant negative relationship with firm's total risk.

H2: Social disclosures have a significant negative relationship with firm's total risk.

Few studies to date have directly examined the link between a firm's ESD and its systematic risk; majority had treated the risk as an independent variable in explaining a firm's ESD. Cormier, Nurius, and Osborn (2009) study has resulted with quantitative social and human capital disclosures having a significant negative relationship with systematic risk, measured by the share price volatility. It is consistent with the finding of Spicer (1978) that pollution control disclosures have a significant negative relationship with systematic risk. On the other hand, Park et al. (2017) found that the interaction between geographical diversification and positive CSR activities is positively related to systematic risk. Therefore, this study extends the first and second hypotheses as follows:

H1a: Environmental disclosures have a significant negative relationship with firm's systematic risk.

H2a: Social disclosures have a significant negative relationship with firm's systematic risk.

Boutin-Dufresne and Savaria (2004) who examined the link between unsystematic risk and the level of social responsibility of Canadian firms found a negative relationship between the ESD of a firm and the level of specific risk for that same firm. Such a finding suggests that the more "responsible" a company is, the less it is exposed to a firm-specific risk component (Benlemlih, Shaukat, Qiu, & Trojanowski, 2018; Luo & Bhattacharya, 2009). A firm with leading (lagging) corporate social performance exhibits significantly lower (higher) unsystematic risk and that unsystematic risk might be priced by the broader global equity market (Lee & Faff, 2009). Positive ESD has a significant and negative effect on firm unsystematic risk (and vice versa) (Mishra & Modi, 2013). Therefore, this study extends the first and second hypotheses as follows:

H1b: Environmental disclosures have a significant negative relationship with firm's unsystematic risk.

H2b: Social disclosures have a significant negative relationship with firm's unsystematic risk.

4. DATA COLLECTION AND ANALYSIS

This study selected the top 100 public listed companies listed on the Main Board of Bursa Malaysia in 2017 (also (Ong, Tho, Goh, Thai, & Teh, 2016; Sadou, Alom, & Laluddin, 2017)) gathered from the Thompson Reuters DataStream. This selection approach was based on the reason that large firms are more visible, more resourceful, and have a larger impact on society (see Hackston and Milne (1996)). In addition, they are deemed to have greater engagement in corporate governance as well as ES responsibilities and practice more ESD (Aerts, Cormier, Gordon, & Magnan, 2006). The year 2017 was specifically selected as it was the first year of the implementation of sustainability reporting by the public listed companies in Malaysia.

The banking and finance sector is excluded from the list as the industry is governed by a different regulatory framework and governance environment. The exclusion of this sector and companies with incomplete data has resulted to the final samples of 75. This study applied the content analysis

method in gathering the study variables, namely ES information disclosed and firm risks (total risk, systematic risk, unsystematic risk). ESD was obtained from both the annual reports and sustainability reports for year 2017, while the firm risks were calculated based on the share prices obtained from Bursa Station.

Firm's total risk is contributed by two components, namely the systematic risk and unsystematic risk. To assess the firm risk, the following equation was used.

$$\text{Total Risk} = \text{Systematic Risk} + \text{Unsystematic Risk}$$

Total risk is calculated using the standard deviation of the stock returns over a one-year period (Bouslah et al., 2013; Jo, Kim, & Park, 2016; Orlitzky & Benjamin, 2001). Before calculating the standard deviation of the stock return, the stock return is determined using the following formula.

$$\text{Return} = \frac{\text{Closing price} - \text{Opening price}}{\text{Opening Price}}$$

Then, the total risk is then calculated using the following formula and it is annualized to get the total risk for the year.

$$\text{Total risk} = \sigma = \sqrt{\frac{1}{N} \sum_{i=1}^N (x_i - \mu)^2}$$

Systematic risk is measured by calculating a firm's beta based on the standard Capital Asset Pricing Model (CAPM) using the daily excess returns (Benlemlih et al., 2018; Sassen, Hinze, & Hardeck, 2016). The amount of beta according to the CAPM can be calculated using the slope of the regression line between return for the market and return of the individual security Lee, Ayoub, and Agrawal (2016). The daily stock prices and stock market index prices were used in determining the return. Then, the amount of residual indicates the unsystematic risk of the investment. The standard deviation for the residuals will give the unsystematic risk for the one-year period (Bouslah et al., 2013; Chollet & Sandwidi, 2018; Sassen et al., 2016; Akbar et al., 2022; Oppong & Bruce-Amartey, 2022; Rahman & Islam, 2022). The equation can be further illustrated as follows:

$$R_p - R_f = \beta (R_m - R_f) + \varepsilon$$

Where:

R_p = Return of investment

R_f = Risk-free rate

β = Systematic Risk

R_m = Return of market

$(R_m - R_f)$ = Market risk premium

ε = Residual

ESD, the independent variables in this study were measured based on the information reported by the sampled companies based on the Bursa Malaysia Sustainability Reporting Guide-line.

Table 1.1. Environmental and Social Disclosures’ Sub-Dimensions.

Dimension	Sub-Dimension
Environment	Emission
	Waste and Effluent
	Water
	Energy
Social	Diversity
	Human Rights
	Occupational Safety and Health
	Anti-competitive Behaviour
	Anti-corruption
	Labour Practices
	Product and Services Responsibility
	Supply Chain
Compliance	

Source: Sustainability Report Guide (2015) by Bursa Malaysia.

Table 1.1 states the key and 13 sub-dimensions of the ESD studied. The extent of the ESD was measured and scored using the rating scale by Sumiani et al. (2007) and Yusoff et al. (2015). The level of extensiveness for each disclosure was further categorised into general disclosure (GEN), qualitative disclosure (QUA), quantitative disclosure (QUAN), and a combination of qualitative and quantitative disclosure (COMB) (Refer to Table 1.2).

Table 1.2. Scales for Environmental and Social Disclosures Index.

Scale	Measurement	Score
General disclosure (GEN)	Any sentence related to environmental and social disclosures.	1
Qualitative disclosure (QUA)	Non-financial data of environmental and social disclosures.	2
Quantitative disclosure (QUAN)	Financial data of environmental and social disclosures.	3
Combination of qualitative and quantitative disclosure (COMB)	Combination of financial and non-financial data of environmental and social disclosures.	4

The control variable used in this study is return on assets (ROA), represents the effect of firm’s profitability on firm risk. It is calculated as the ratio of profit before tax to total assets.

The summary of the measurements for the variables used in this study is shown in Table 1.3.

Table 1.3. Summary of the Measurements of Variables.

Variables	Measurement	Key Literature
Total Risk	Annualized standard deviation of daily stock returns.	Jo et al. (2016); Bouslah et al. (2013); Benlemlih et al. (2018); Sassen et al. (2016)
Systematic Risk	Slope of the regression line between return for the market and return of the individual security.	Jo et al. (2016); Chollet and Sandwidi (2018); Benlemlih et al. (2018)
Unsystematic Risk	Standard deviation of residuals from the CAPM model.	Sassen et al. (2016); Chollet and Sandwidi (2018); Benlemlih et al. (2018); Bouslah et al. (2013)
Environmental Disclosures	Score of the disclosure based on the ratings.	Sumiani et al. (2007); Yusoff et al. (2015); Siman, Ismail, Aziz, and Zam (2018)
Social Disclosures	Score of the disclosure based on the ratings.	Sumiani et al. (2007); Yusoff et al. (2015)
Profitability	Return on Assets (ROA), which is pre-tax income divided by total assets.	Sassen et al. (2016); Benlemlih et al. (2018)

Inspired by the works of Bouslah et al. (2013) and Sassen et al. (2016) three models have been constructed to test the link empirically. All the models can be illustrated as follows:

$$TR = \beta_0 + \beta_1 ENV_{it} + \beta_2 SOC_{it} + \beta_3 ROA_{it} + \varepsilon_{it} \quad (1)$$

$$SR = \beta_0 + \beta_1 ENV_{it} + \beta_2 SOC_{it} + \beta_3 ROA_{it} + \varepsilon_{it} \quad (2)$$

$$UR = \beta_0 + \beta_1 ENV_{it} + \beta_2 SOC_{it} + \beta_3 ROA_{it} + \varepsilon_{it} \quad (3)$$

Where:

TR = Total risk

SR = Systematic risk

UR = Unsystematic risk

ENV = Environmental disclosures

SOC = Social disclosures

ROA = Return on assets

i = Company

t = year

5. FINDINGS OF THE STUDY

Descriptively, the study found that 28% of the studied Malaysian companies do not disclose the environmental

information either in their annual report or sustainability report in the year of study. The highest ranked environmental information disclosed is the ‘non-hazardous waste generated’ (Median = 2) followed by ‘energy consumed’ (Median = 1). Both the categories of environmental information have been extensively disclosed (48% respectively), and in qualitative and quantitative forms. Whilst for the social disclosures, ‘employee benefits’ was the most disclosed (100%) (Median = 4) and most extensive information reported in the two mediums of reporting studied. The information was highly disclosed in both qualitative and quantitative forms.

Additionally, the level of environmental disclosures is still low with the mean score being only 11.61. As for the social disclosures, all companies have disclosed some form of social information in both their annual reports and sustainability reports. Yet, the disclosures are also seen to be rather minimal, with a mean score of 28.32.

Table 1.4 shows the descriptive statistics for the dependent variables used in the empirical model.

Table 1.4. Descriptive Statistics for Dependent Variables.

Dependent Variables	Minimum	Maximum	Mean	Standard Deviation
Total risk	.079866	.592069	.237477	.097133
Systematic risk	-.894010	2.837441	.899149	.616038
Unsystematic risk	-2.393948	1.123955	-.661672	.573645

The normality test employed in this study used the skewness and kurtosis. Given the results of the test, it can be concluded that all data were normally distributed, thus further analysis was able to be performed. Two tests were conducted to identify the multicollinearity, namely; the Tolerance and Variable Inflation Factor (VIF), and it can be concluded that there is no strong correlation among the independent variables and hence, the model is fit for further analysis.

Pearson’s correlation coefficient was used to describe the strength and direction of the linear relationship between the variables (see Table 1.5). The results show that there is no significant relationship between total environmental disclosure and total risk, systematic risk and unsystematic risk. Besides, there is also no significant correlation between total social disclosure and total risk, systematic risk and unsystematic risk. However, there is a significant correlation between environmental disclosures and social disclosures. It is also discovered that there is a significant correlation between total social disclosures and return on assets. In addition, there is a significant correlation between unsystematic risk and systematic risk, and the total risk has a significant correlation with systematic risk. Lastly, there is also a significant correlation between unsystematic risk and total risk.

Table 1.5. Pearson’s Correlation Coefficient (Bivariate).

	1	2	3	4	5	6
1. Total risk	1					
2. Systematic Risk	.500**	1				

	.000					
3. Unsystematic risk	-.368**	-.989**	1			
	.001	.000				
4. Return on Assets	-.242*	-.153	.123	1		
	.036	.191	.294			
5. Total Environmental	-.112	-.040	.024	.186	1	
	.339	.736	.841	.111		
6. Total Social	-.041	-.043	.039	.280*	.703**	1
	.727	.714	.738	.015	.000	
Correlation is significant at the 0.01 level (2-tailed).**						
Correlation is significant at the 0.05 level (2-tailed).*						

Three models of multiple regression analysis were conducted. The firm risk, which encompasses total risk, systematic risk and unsystematic risk, is subjected to multiple regressions having two types of predictors, which are environmental disclosures (ENV) or social disclosures (SOC) and return on assets (ROA) as the control variable.

The result for Model 1 shows that there is no relationship between environmental disclosures and the total risk of the studied companies. Hence, the test failed to reject the null hypothesis and H1 is therefore not supported. This finding is consistent with previous studies such as Haryono et al. (2016) and Jo et al. (2016); in which environmental disclosure is not a key determinant of firm’s total risk. Next, the result for Model 2 shows that there is no relationship between environmental disclosures and the systematic risk of the studied companies. Hence, the test failed to reject the null hypothesis and H1a is not supported. Similar results have been found in studies of Benlemlih et al. (2018); Jo et al. (2016) as well as Oikonomou et al. (2012). Thus, environmental disclosure is not a key determinant of the firm’s systematic risk. Furthermore, analysis for Model 3 has resulted with no association between environmental disclosures on the unsystematic risk. The test failed to reject the null hypothesis and H1b is not supported (also Haryono et al. (2016)).

The second hypothesis of the study pertains to the relationship between social disclosures and firm risk. The first model used total risk as the dependent variable, while the second and third models used systematic risk and unsystematic risk, respectively, as the dependent variables. Through Model 1, it has been found social disclosures and the total risk are not related (also (Cai et al., 2016; Haryono et al., 2016)). Henceforth, the test failed to reject the null hypothesis and H2 is not supported. Social disclosures were also discovered not linked to the systematic risk of the studied companies (Benlemlih et al., 2018; Cai et al., 2016; Oikonomou et al., 2012). Accordingly, the test failed to reject the null hypothesis and H2a is not supported. Consistent with the findings relating to environmental disclosures, analysis performed through Model 3 has evidenced no connection between environmental disclosures and the unsystematic risk of PLCs in Malaysia. Thus, the test failed to reject the null hypothesis and H2b is not supported.

The overall findings reveal that ESD do not significantly influence the firm risk of the top 100 listed firms in Malaysia. The insignificant discoveries pertaining to the link between ESD and all the specific type of firm risks indicate that the volatility in the return of the securities amongst the sampled companies in Malaysia are not caused by the disclosure practices. The findings put forward some local insights that ESD does not influence and affect the investment decisions of the companies' investors in Malaysia. Such findings also imply to a large extent the irrelevance of the stakeholder theory in understanding the behavioural aspects of corporate disclosure of ES information in reducing firm risks.

6. DISCUSSION AND CONCLUSIONS

The main objective of this study is to examine the possible relationship between ESD and firm risk. In a nutshell, environmental and social disclosures have been discovered to be low among the top 100 listed companies in Malaysia for the year 2017. Although mandatory requirement has been imposed to companies to disclose ES-related information in their annual report or other stand-alone reports, the reporting practice was found to be of the least priority.

Specifically, the study has discovered that ESD have no association with the specific firm risk namely total risk, systematic risk, and unsystematic risk amongst the top 100 Malaysian public listed companies. The non-relationship between ESD with any of the specific firm risk may be influenced by the quality of the ESD in Malaysia. The level of the disclosures was found low; which to a certain extent it reflects that this information is of less value-relevant to the key relevant stakeholders. Hence, it does not impose any effect to the level of firm risk. The discovery of this study infers that investors have minimal demands and reliance on ES information of the public listed companies for them to make financial-related decisions. Apart from investors, other company's stakeholder groups such as creditors, employees and local authorities may not value the importance of ES-related activities and initiatives of Malaysian companies. In other words, the corporate citizenship role of the Malaysian companies pertaining to sustainable development is less focused or non-essential at all in this developing economy.

The result of the study could also be due to the differential recognition of the association between CSR and firm risk by various stakeholders' groups. Such a finding signals the 'none to minimal' pressures of stakeholders to companies in Malaysia to engage with sustainability. As compared to other countries, especially those developed and western economy, non-profit organizations play a vital and strong role in putting pressures demanding companies to ensure that their operations and management supports the ecological development of the Earth and the well-being of the society. Flip of the coin, the findings of this study may also imply that the ES-related and sustainability initiatives of the Malaysian companies are highly institutional-driven which may be based on moral and ethical stances.

According to the stakeholder theory, company involvement in the ES responsibilities could generate intangible assets which could be in terms of reputation, trust and loyalty that stem from consumers' support of the products and services offered. Investors value such intangible assets owned by a

company as they could contribute to a firm's better performance and reduce fluctuation on the return or the firm risk. Nevertheless, the results of this study are not aligned with the theory since the investors did not primarily consider the ESD in their investment decision-making. Therefore, the theory is deemed irrelevant in understanding the link between ESD and firm risk in Malaysia. This might also be due to limited observation of 100 listed companies in Malaysia in only one-year period.

Although findings on Malaysian companies have failed to indicate any favourable relationship to firm risk, this study has contributed to (i) the regulators, namely the government and Bursa Malaysia that continuous initiatives should be performed on ESD guidance and (ii) the companies on the need for new strategies towards a successful implementation of ESD. Thus, this study proposes a longitudinal study to have better understanding and analysis on how firm risk would have been affected by the ES practices and disclosure over a longer period of observation.

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Received: Jan 10, 2023

Revised: Jan 20, 2023

Accepted: Mar 29, 2023

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