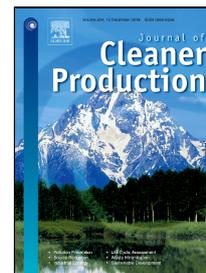


Accepted Manuscript

Integrating Sustainability Reporting into Enterprise Risk Management and its Relationship with Business Performance: A Conceptual Framework



Muhammad Kashif Shad, Fong-Woon Lai, Chuah Lai Fatt, Jiří Jaromír Klemeš, Awais Bokhari

PII: S0959-6526(18)33136-6
DOI: 10.1016/j.jclepro.2018.10.120
Reference: JCLP 14522
To appear in: *Journal of Cleaner Production*
Received Date: 14 May 2018
Accepted Date: 10 October 2018
Publication Date: 20 January 2019

Please cite this article as: Muhammad Kashif Shad, Fong-Woon Lai, Chuah Lai Fatt, Jiří Jaromír Klemeš, Awais Bokhari, Integrating Sustainability Reporting into Enterprise Risk Management and its Relationship with Business Performance: A Conceptual Framework, *Journal of Cleaner Production* (2018), doi: 10.1016/j.jclepro.2018.10.120

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Integrating Sustainability Reporting into Enterprise Risk Management and its Relationship with Business Performance: A Conceptual Framework

Muhammad Kashif Shad ^a, Fong-Woon Lai ^a, Chuah Lai Fatt ^b, Jiří Jaromír Klemeš ^c, Awais Bokhari ^{d,e*}

^a Management and Humanities Department, Universiti Teknologi PETRONAS, 32610 Seri Iskandar, Perak Malaysia.

^b Marine Department Malaysia Northern Region, 11700 Gelugor, Penang, Malaysia

^c Sustainable Process Integration Laboratory – SPIL, NETME Centre, Faculty of Mechanical Engineering, Brno University of Technology – VUT Brno, Technická 2896/2, 61669 Brno, Czech Republic

^d Chemical Engineering Department, Institute of Self-Sustainable Living, Universiti Teknologi PETRONAS, 32610 Seri Iskandar, Perak Malaysia

^e Chemical Engineering Department, COMSATS University Islamabad (CUI), Lahore Campus, Defence Road, Off Rawind Road, Lahore, Pakistan

*Corresponding Author Email: engineer.awaisbokhari@gmail.com

ABSTRACT- This paper conceptualises a framework that examines the moderating effect of sustainability reporting practices on the relationship between enterprise risk management (ERM) implementation and business performance. Business performance is proxied through a value-added measurement technique, namely the economic value added (EVA). An Effective ERM adoption has a significant positive impact on businesses' overall performance. However, there are limited studies conducted on ERM implementation and how sustainability reporting could influence organisations' performance through ERM. Many business organisations globally do not incorporate sustainability initiatives within their corporate strategy, whereas they should be critical input for strategic management and corporate planning. By combining the Stakeholders Theory and the Modern Portfolio Theory, this study integrates ERM implementation with sustainability reporting to examine their effect on business performance's economic value added. This paper proposes a quantitative content analysis of the of the annual reports to obtain information about companies' enterprise risk management practices and sustainability reporting. While secondary data related to the economic value added (EVA) measurement will be extracted from Thomson Reuters DataStream. The paper proposes ordinary least square (OLS) for the proposed analysis. The conceptual model espoused by this study will provide insights in formulating strategies and serve as an important conduit to enhance the EVA performance especially of the oil and gas companies. The EVA performance can be achieved through the improvement of price to earnings ratios and the reduction of cost of capital by reducing information asymmetry among the business, the insurance companies, the lenders and the shareholders of the company.

Keywords—Enterprise Risk Management (ERM), Sustainability Reporting, Business Performance.

1. Introduction

The emergence and popularity of ERM have ensued from a response to the rapid changes due to globalisation and regulatory pressure on organisations to manage risk holistically. Its importance dramatically increased in recent years due to a series of corporate fraud, financial scandals, increasing the complexity of risks and pressure from regulatory bodies (Lechner and Gatzert, 2017). The Committee of Sponsoring Organisations of the Treadway Commission (COSO), posits that the businesses would continue to face a future full of uncertainty (COSO, 2017). This uncertainty can be both negative and positive, influencing the key objectives of the organization (Rostamzadeh et al., 2018). ERM will be pivotal for any organisation to manage and succeeds through these times. Since the evolution of the ERM, it has been defined in numerous ways. COSO, the leading expert in the field of ERM defined ERM as: "A process, effected by an entity's board of directors, management and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risks to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives." (COSO, 2004). According to Lechner and Gatzert (2017), the aim of ERM implementation in an organisation is to enhance business value by supporting risk manager and senior management to ensure an identification, monitoring and management of the company's overall risk portfolio. Pertaining to that the oil and gas industry is one of the many industries that have received considerable attention when it comes to the management of risks (Liew and Lee, 2012). The oil and gas industry is arguably the most strategic and risky industry, generally involves complex and diverse risks which cause threat to their sustainable development, huge economic and financial losses, potential hazards to society and environment (Adam, 2014). There exists a number of risks, such as the regulatory compliance, environmental, social issues, workplace health and safety, apart from the primary operational risk of the business itself. More efforts are needed in oil and gas industry to improve business overall performance in the dynamic and risky environment. The same goes for the Malaysian oil and gas industry, which is a key player in the economic growth and of strategic importance in supporting future sustainable development plans of the Malaysian economy.

ERM play a significant role in sustainable development of the organisation through identification, measurement and management of risk including sustainability-related risks. It also ensures sustainability of the organisation and improves economic efficiency and growth as well as enhance investors' confidence. ERM is one of the significant factors that affect business performance. Nevertheless, the changes in business environment,

internationalisation, technological development, thinking the behaviour of stakeholders with new trends and conceptions being developed to which organisations should respond if they really want to be successful (Krenchovská and Prochazková, 2014). Also, the recent changes in the global business environment, new regulations, geopolitical threats, increasing stakeholder demands persuade corporations for a change of approaches to rigorous and effective ERM framework (Subramaniam et al., 2015). The rigorous ERM framework in a way would help to achieve high performance and social accountability and responsibility. The question is how an organisation will respond to the recent changes and challenges they face in order to be accountable and responsible to all their stakeholders in corporate level. One of the channels that can make organisation accountable to all its relevant stakeholders is the issuance of sustainability reports. Reporting of the information regarding business sustainability-related activities and risk management responds to the growing expectations of the business investors and other stakeholders. For instance, Niemann and Hoppe (2017) postulated that to respond to the growing expectations and awareness on the significance of the enterprise contributions to sustainable development, there is an increased incentive for organisations to disclose their sustainability practices (Greiling and Grüb, 2014). Towards this end, Bursa Malaysia (Kuala Lumpur Stock Exchange) has established a listing rule requiring companies to disclose a sustainability narrative statement in their annual report explaining how the company has managed the material economic, environmental and social risks and opportunities facing the business starting from the year 2016.

Sustainability reporting has become one of the world trends and a challenge for the organisations in recent years. Prior studies on enterprise risk management and sustainability reporting practices focused on developed nations, mainly the United States, United Kingdom, China, Japan, France and Germany. It would be of great interest to execute a research in this area in the developing nation such as that of Malaysia. Additionally, the study by Tavakoli and Talib (2014), mentioned that there are so many studies conducted on ERM, but a clear understanding about the association between ERM implementation, sustainability reporting and business performance is not thoroughly investigated. To overcome these issues effectively this study develops a conceptual model that consolidates enterprise risk management and sustainability reporting that could influence the business performance measured through EVA analysis among oil and gas companies.

2. Literature Review and Model Development

In the era of globalisation, the devotion on the issues related to Enterprise Risk Management (ERM), sustainability reporting and business performance is growing in both research and practice and has attracted the attention of all industries including the oil and gas industry. Several different studies have contributed to this body of knowledge, taking various aspects into consideration. In this paper, comprehensive literature is

conducted to explore and identify the research gap on ERM implementation, sustainability reporting, and business performance. This study focusses on three associated streams of literature. Firstly, the debate on the issue that organisations may enhance their performance by implementing a holistic approach to risk management. Secondly, the relationship between sustainability reporting and business performance and lastly, the moderating effect of sustainability reporting on the relationship between ERM implementation and business performance.

2.1 Enterprise Risk Management

Enterprise Risk Management (ERM) is becoming an increasingly popular approach among practitioners and researchers that seeks to provide ways to recognise and mitigate risks holistically faced by the organisations. In the beginning, risk management was developed to manage risks that occur in financial institutions and insurance companies and was named as traditional risk management (Schiller and Prpich, 2014). With the passage of time organisations realised that the scope of risks has been extended beyond the investments and liability risks to translational risks, currency exchange risks, operational risks, technological risks and various other risks that may also hover an enterprise. Enterprises shall understand and manage all risks holistically, not just as an individual threat but also with an understanding of the interactions between them. The development of traditional risk management to enterprise risk management and their impact on business performance clearly suggest that business growth cannot only rely on conventional business tactics and strategies. There has been always a room for improvement in business strategies and entrepreneurial orientations, not only to maximise business performance but to establish a ground for sustainable development. ERM has appeared as a concept that overcomes the deficiencies of traditional risk management, yet few studies have been found about its effectiveness and usefulness (McShane et al., 2011). It is slowly gaining more devotion as more and more scholars and practitioners are exploring deeper to expose new and better ways to manage risks and attain its benefits through its implementation (Low et al., 2013). To encourage the implementation of ERM, various frameworks have been developed by relevant organisations. Following four non-regulatory ERM frameworks and standards that are frequently adopted by corporations:

- The Committee of Sponsoring Organisations of the Treadway Commission. Enterprise Risk Management Integrated Framework.
- AS/NZS 4360:2004: Risk Management Standard.
- Federation of European Risk Management Associations (FERMA). A Risk Management Standard.
- ISO31000: 2009 Risk Management – Principles and Guidelines on Implementation of Enterprise Risk Management.

Although, various frameworks and standards guiding the concept, the findings from the “2008 ERM Benchmarking Survey” lead by the Institute of Internal Auditors (IIAs) and IIA Research Foundation’s Global Audit Information Network proposed that COSO’s ERM Framework is the most frequently used framework to guide the ERM processes. The COSO ERM framework came to be one of the top ten books in one of the surveys conducted to explore the most useful literature read by researchers. Also, in the US, the (COSO) 2004 ERM model has been proposed to become a world level template for best practice in ERM execution (Power, 2009). The COSO framework delivers leading capabilities, guidance and support on ERM, internal audit and fraudulent activities (COSO, 2004). This paper uses COSO integrated ERM framework. It also plans to identify how COSO ERM integrated framework contributes to the business performance, as well as find the role of sustainability reporting as a moderator towards business performance. Consistent with the empirical evidence from the literature reveal that ERM implementation enhances the value of the larger business by reducing earning volatility, provide higher returns, reduce the business cost of capital and enhance efficiency (Zou et al., 2017).

2.2 Business Performance

Measuring organisation/business performance is significant as it provides information on organisational objectives and how well they have been achieved. Well performing organisations attract investors, as investors monitor a company’s overall performance in making investment decisions, whether to initiate, to stay or to quit an investment. It is often noted that in the management discipline, measuring organisation’s performance is widely addressed and the ultimate dependent variable of interest. Organisational performance can be measured using various metrics (Richard et al., 2009). An organisation gains an advantage if they choose the best approach for measuring their performance. Organisational performance can be measured by perceived (primary sources) and objective (secondary sources) measures. Perceived measures are also known as subjective measures, where primary data collected through survey and questionnaire instruments are used to measure the company or business performance (Selvarajan et al., 2007). Objective measures are secondary sources where secondary data such as financial data is used to measure the performance of the business or a company. According to Richard et al. (2009) objective measures are classified into accounting, market and hybrid measures by means of which organisations can measure their performance. Objective measures are classified into three categories, namely (1) financial performance - percentage of sales resulting from new products, profits, capital employed, returns on assets, returns on investment, returns on equity, earning per share and net income after tax; (2) market performance (sales, market share); and (3) shareholder returns (total shareholder returns, economic value added). Chakravarthy (1986) stated that financial measures are incapable of distinguishing the differences in performance among business. Kaplan and Norton (1996) affirmed that

financial or accounting measures can give misleading results about continuous improvement and innovation of an organisation. This infers that financial or traditional measures are not appropriate for measuring business performance, and value-based measures, such as that of EVA, have become increasingly important. EVA is a measure of the dollar surplus value created by an investment or a portfolio of investments. It is the product of the "excess returns" made on an investment and the capital invested in that investment. The concept of EVA is widely used by western companies in evaluating their performance (Kvach and Il'ina, 2013). Stern et al., (1995) suggest that EVA is a fundamental corporate performance measure indicating the efficiency of management in turning investors' capital into profits, i.e., creating value. Alfred Marshall said in 1896, "there is no profit unless you earn the cost of capital" (Ehrbar, 1999). EVA has schematised this idea because EVA incorporates the cost of capital in performance evaluation. Accounting measures are widely used for performance evaluation, but they are not better than EVA because EVA is calculated by deducting the capital charge from net operating profit after tax. The capital charge of the business is its Weighted Average Cost of Capital (WACC) multiplied by invested capital. In calculating WACC, cost of equity and the cost of debt are considered. Accounting measures do not consider the cost of capital of the business. Following previous research, this study adopts the EVA to evaluate business performance due to its prominence over other performance measures. EVA can be calculated by using the following model.

$$EVA = NOPAT - [WACC \times \text{Capital Employed}]$$

where,

NOPAT is net operating profit after taxes,

WACC is the Weighted Average Cost of Capital,

Capital Employed is the total assets net of non-interest-bearing liabilities.

The use of EVA represents an attempt to measure whether the management of an entity has used available resources for creating or destroying the value of the organisation. The difference between the indices capital charge and NOPAT makes it possible to determine the relative efficiency with which the capital is being used, i.e. how efficiently the capital is being used in the company compared to alternative types of investment (Kvach and Il'ina, 2013).

2.3 Enterprise Risk Management and Business Performance

Consistent with the previous empirical literature this study hypothesises that the implementation of rigorous ERM system will have a significant positive impact on business performance, though the initiating and maintaining an ERM system in an organisation may be costly (Lechner and Gatzert, 2017). In line with the

relationship between ERM and business performance, Nocco and Stulz, (2006) postulated that ERM is intended to create shareholders value by improving risk and returns trade-off on various project. This helps in making strategic and business plans as well as exposure to all business risks and ultimately improves business competitive advantage. An organisation with rigorous ERM system is assumed to better be able to make proper strategic and economic decisions. This system is tending to invest in more valuable net present value projects. Florio and Leoni, (2017) carried out a thorough review of the risk management literature and found that risk management to be related to the business value. Hoyt and Liebenberg, (2011) stated that ERM adoption is beneficial in the reduction of taxes, mitigation of incentive conflicts, and to create new opportunities for an organisation. They conducted this study focusing on publicly traded US insurance companies. In the study, they made a comparison between ERM and non-ERM insurance companies and their overall value. The study found a highly significant relation between ERM and business value, with ERM premium of approximately 17 % to 20 % being found economically and statistically significant. McShane et al., (2011) also investigated the relationship between ERM implementation and the business performance. Based on a dataset obtained from 82 insurance companies, they revealed that the shareholder value was positively impacted by the implementation of an ERM strategy. Lai et al., (2011) postulated that ERM in the organisation leads to shareholder value creation. This author developed a model, which theorised a causal relationship between ERM implementation and improvement in shareholder value. The authors posit that ERM implementation within the business leads to several tangible and intangible advantages. The advantages obtained from ERM adoption contributed to the reduction of cost of capital and enhancement of business performance. Waweru and Kisaka, (2013) sought to investigate whether ERM is positively or negatively related to business value. The author investigated 22 companies listed in Nairobi Stock Exchange in 2009. The results revealed that ERM in the sampled companies was a non-regulatory requirement and it was used as a strategic business initiative. They found a positive and significant relationship between ERM implementation and Tobin's Q.

Not all studies have found a significant positive association between ERM adoption and ERM value proposition (Agustina and Baroroh, 2016). For instance, Tahir and Razali, (2011) investigated 528 listed companies in Bursa Malaysia. The study estimated the relationship between ERM and business value by employing Tobin's Q ratio. The results showed that there is a positive but not significant relationship between ERM and business value exists. The results of the study have rejected the hypothesis that ERM in a business can bring higher Tobin's Q than a business not practising ERM. Pagach and Warr, (2011) conducted a study by taking 106 companies as a sample and using return on equity as a proxy for business value. They found a reduction in earnings volatility in business, which adopted ERM. Overall study has failed to support the view that ERM creates value for the business. Quon et al., (2012) used a sample of 156 non-financial businesses in Canada to

scrutinise the relationship between ERM information content and business performance and found inconclusive results about the relationship between ERM and business performance. Table 1 below provides a comprehensive view of some studies that have explored ERM implementation and its relationship with business performance. In these studies, the implementation of an ERM strategy was proxied by the subjective measures (questionnaire survey) and objective measures through content analysis. The content analysis was conducted using a keyword search of the phrases like ERM, risk management, chief risk officer (CRO), integrated ERM framework or COSO ERM framework, risk committee, holistic risk management, risk officer and centralised risk manager. The obtained information was dated and coded with a dichotomous variable.

Regarding the research methods and underlying data of the business performance, these studies used different methods and various techniques to measure business performance. Florio and Leoni, (2017) used return on assets (ROA) and Tobin's Q ratio, Callahan and Soileau, (2017), used return on assets (ROA) and return on equity (ROE), Agustina and Baroroh, (2016), used Price to Book Value (PBV), while Lechner and Gatzert, (2017), and McShane et al., (2011) used Tobin's q (a company's market value ratio to its replacement cost of assets) for performance assessment. This indicates that these studies emphasised only on economic and market performance, for which traditional indicators of financial analysis (e.g. return on equity, return on assets, Tobin's q ratio etc.) are most often used. None of the studies in Table 1 includes the concept of value-based measurement for performance evaluation and management. Overall, it can be concluded that the relationship between ERM and the business performance was inconclusive. It is still an open question whether the practising of ERM leads to an increase in a business performance in terms of value-based measurement system such as EVA. EVA is the best performance measurement tool because it combines a range of factors such as the economy, accounting, and market information in the evaluation of the enterprise performance. EVA analytic is used in this study because it embodies value creation after considering a risk-adjusted capital charge for a given business venture or investment. It would be of great interest to carry out a research in focusing on ERM implementation and business performance measured through EVA in the oil and gas industry. This research proposes the development of the following hypothesis.

H1: Increasing implementation of ERM will have a positive impact on business performance measured through EVA analysis.

As formulated, the hypotheses are based on the idea that an effective ERM is beneficial to enhance the various EVA factors as well, for instance, maximise net operating profit after tax, reduce the weighted average cost of

capital and enhance return on invested capital. The verification of these association is tested by following hypotheses.

2.3.1 ERM and Net Operating Profit after Tax (NOPAT)

The value maximisation literature argues that ERM implementation enhances companies' profitability. It increases the awareness about the risks that help in making better strategic decisions (Lai et al., 2010). A better decision making allows the organisation to meet strategic objectives, decrease earnings volatility, and enhance their value. It leads to higher sales return by managing operational risks faced by the enterprises (Shad and Lai, 2015a). Risk monitoring and disclosure can decrease operational risks and empower the business to focus on its resources to undertake business activities and generate value. Consequently, ERM can reduce the fluctuation of operating income. The increase in sales revenue and the lowering cost of goods sold due to ERM shall enhance the business NOPAT. The hypothesis is proposed as shown below: -

H1 (a): Increasing implementation of ERM will have a positive impact on business net operating profit after tax (NOPAT).

2.3.2 ERM and Weighted Average Cost of Capital (WACC)

ERM reduces the business overall risk by reducing its earnings volatility and improving the capital structure (COSO, 2004). Capital structure is composed of debt and equity financing raised by the business to finance their assets. One of the objectives of ERM is to reduce the business weighted average cost of capital (WACC) (Lai and Shad, 2017). ERM play a significant role in reducing the cost of capital of the enterprise. Its implementation helps to improve the information available about enterprises' risk profile. This information can be shared with investors, thus, reduces information asymmetries and leads to a lower cost of capital. A reduction in the enterprise overall risk profile will help them to enjoy better credit ratings from the rating agencies and lowering the expected rate of return from the shareholders as well as the required risk premium charge from the debt holders when it issues capital instruments such as shares and bonds. ERM adoption can improve business credit ratings which are used by external stakeholders as a signal of financial strength. Standard and Poor's, Malaysian Rating Corporation Berhad and other rating agencies explicitly evaluate business ERM program as part of their rating process. Based on this, the following hypothesis is proposed:

H1 (b): Increasing implementation of ERM will have a positive impact on reducing the business weighted average cost of capital (WACC).

2.3.3 ERM and Return on Invested Capital (ROIC)

A higher return on invested capital indicates the organisation's abilities to utilise its capital resources efficiently. Shareholders value is created when an enterprise is able to generate a return from the capital invested higher than the required return or hurdle rate. And this hurdle rate must be equal to or higher than the rate that shareholders expect to earn by investing in an alternative but equally risky investment (Zou et al., 2017). ERM is intended to optimise the risk-return trade-off and generates the business long-term value. The implementation of ERM in the business will enable it to make appropriate economic decisions and facilitate investment in more positive net present value (NPV) projects (Shad and Lai, 2015b). In this regard, the following hypotheses are proposed:

H1 (c): Increasing implementation of ERM will have a positive impact on business invested capital (IC).

Table 1: Enterprise Risk Management and Business Performance Related Empirical Studies

Insert Table 1 here.

2.4 Sustainability Reporting

Sustainability is an evolving area of research and is grabbing the attention of corporations, research communities, and regulatory bodies worldwide which had enhanced its implementation (Olawumi and Chan, 2018). The concept of corporate sustainability refers to the ability of an organisation in using their limited resources effectively and efficiently over time in which waste is deliberately reduced, and best practices are implemented. It is comprised of three dimensions for instance, economic, environmental, and social sustainability. The sustainability approaches adopted by any industry or sector to which they belong must include these three dimensions (Gopalakrishnan et al., 2012). These three dimensions of sustainability are collectively termed the triple bottom line (3BL). The economic dimension of the 3BL refers to economic prosperity, profit-making, attaining competitive advantage and sustaining the overall economic value of the business. The environmental sustainability includes factors relating to the environmental quality such as; climate change, global warming, pollution and depletion of ozone layer. The social dimension includes the issues related to social progress such as health and safety, community well-being, employment opportunities, charity, and organisational behaviour (Aras, et al., 2018).

The idea of a 3BL, in its present form, started from the UN's creation in 1983 of The World Commission on Environment and Development (WCED), headed by the former Prime Minister of Norway, Gro Harlem

Brundtland. The most acceptable quote from the Brundtland report defined sustainable development as “development that meets the need of the present generation without compromising the ability of future generations to meet their needs”. The 3BL suggests that the interface of the economic, environmental and social performance of an enterprise. The enterprise should engross in such activities that not only improve economic, environmental and social performance but which also affect positively the long-term competitive advantage and sustainable development of the business (Carter and Rogers, 2008).

For corporations focusing on sustainability need to ensure that the business is able to manage the business risk while meeting the stakeholder expectations. The organisation that seeks to perform their businesses in socially responsible and holistic manner should attempt to put in place sustainability management framework that dominate in predicting the organizational performance (Maletič et al., 2018). It involves the transformation of a set of technical concepts into political and business policies and practices that are directly linked to organisational performance. The adoption of sustainable practices particularly in the energy sector increases resource-use competence and greater adoption of clean and environmentally friendly technologies and industrial processes. Sustainability reporting practices will help oil and gas industry to minimise social/political costs form long-term relationship with the relevant stakeholders, reduce risks of heavy environmental and labour compliance, attracting new and maintaining best talents, building enterprise image and reputation, and broadening the customer base and loyalty (Ermenec et al., 2017). This research aimed to encourage oil and gas industry to engage in, create awareness as well as understand economic, environmental and social sustainability. Accordingly, this article examines the causal relationship between ERM implementation and business performance with moderating effect of sustainability reporting.

2.4.1 Sustainability Reporting in Malaysia

Sustainability is grabbing the attention of government, practitioners, corporations, research communities, and regulatory bodies worldwide. In Malaysia, the concept of corporate sustainability is still of a voluntary nature (Zahid and Ghazali, 2017). However, looking at its importance, many Malaysian organizations through various plans, toolkits, guidelines, programs, policies etc., are involved actively in promoting sustainability. The Malaysian government has addressed its expectations on the compliance of corporate sustainability in several chapters of its current developmental plan of (2016-2020). Moreover, Bursa Malaysia is working devotedly for promoting sustainable business practices among the listed companies in Malaysia (Aman et al., 2015). More importantly, Bursa Malaysia has adopted the global reporting initiative (GRI) framework and it is encouraging the listed companies to follow suit for measuring their firms’ corporate sustainability. The Malaysian Code on Corporate Governance (2007) for the first time made Corporate Social Responsibility (CSR) practices

necessary for reporting. The recommendation (1-4) of the MCCG (2012) confines the board members that, the company strategies must ensure sustainability. Moreover, the practice 1.1 and 6.2 of the MCCG (2016) make a proposal to require the board members to promote environmental, economic, and social sustainability through corporate strategies. Although, Malaysia is scored the highest in the emerging economies category in the Southeast Asian region by Association of Chartered Certified Accountant (ACCA), Malaysia in 2010. The sustainability reporting within the Malaysian companies is still very low compared with the number of business in Malaysia (Kasbun et al., 2016). There are various reasons of low sustainability reporting for instance; high reporting cost, lack of resources, inconsistency in disclosure practices, difficulty in measuring performance and difficulty in rousing the companies to be proactive in sustainability reporting. Consequently, sustainability reporting practices among Malaysian companies remains weak (Kasbun et al., 2017).

2.4.2 Sustainability Reporting as a Moderating Factor

In general terms, a moderator is a qualitative or quantitative variable that affects the direction and or strength of the relationship between an independent and dependent variable (Baron and Kenny, 1986). Moderator is a third variable that accelerates the relationship between predictor and criterion variable. Drawing upon the notion presented by Baron and Kenny (1986), about the rationale for a moderating variable, the lack of studies regarding the association of ERM implementation and business performance justifies for a moderator to be introduced. The relationship between ERM implementation and business performance may be further enhanced by multiple factors related to both companies and their context. These factors may include internal and external factors. Internal factors are those strategies and organisational characteristics that are expected to facilitate business abilities to handle internal risk and increase their economic performance (Garcia et al., 2013). External factors are the environmental and social changes that can impact the ability of an organisation to achieve its strategic goals and objectives (Gatignon and Xuereb, 1997). The factors that are focused in most of the prior studies regarding impact of ERM adoption and business performance are business size, age, board of directors monitoring, business complexity (Ping and Muthuveloo, 2015), top management support (Dabari and Saidin, 2014), human capital (Salih et al., 2016), role of board characteristics (Dabari and Saidin, 2016) project complexity and industry interferes (Carvalho and Rabechini, 2015), board equity ownership (Ahmed and Manab, 2016), intellectual capital (Khan and Ali, 2017). More complex factors also found as moderators in some studies, for instance, chief risk officer (CRO) presence (Pagach and Warr, 2011), separate ERM unit, internal auditing etc.

In line with the stakeholder's theory, sustainability reporting incorporates both internal and external factors into consideration. Economic sustainability is internal factors that are dedicated to facilitating the company's

internal abilities and enhance their performance. Social and environmental sustainability reporting are considered as external factors that encourage organisations to operate efficiently and effectively and build their image to maintain and improve their performance (Freeman, 1983). The combination of internal and external factors with enterprise risk management can serve more synergistic effect that will be greater than the sum of their separate effects. This study focuses on sustainability reporting as a moderator variable because it covers both internal and external aspects, such as economic, environmental and social performance. Although empirical research has not yet tested the moderating effect of sustainability reporting so far. The relationship between ERM and business performance will be strengthened with sustainability reporting which addresses the economic, environmental and social (3BL) interest/benefit of the relevant stakeholders. Based on these arguments following hypotheses are being proposed.

H2: Sustainability reporting practices moderates the positive relationship between ERM implementation and business performance measured through EVA analysis.

H2 (a): Sustainability reporting practices moderates the positive relationship between ERM implementation and business net operating profit after tax (NOPAT).

H2 (b): Sustainability reporting practices moderates the positive relationship between ERM implementation and reducing the weighted average cost of capital (WACC).

H2 (c): Sustainability reporting practices moderates the positive relationship between ERM implementation and business return on invested capital (ROIC).

2.4.3 Sustainability Reporting and its Measurement

Numerous standards are available to measure sustainability practices among the organisations. For instance, Dow Jones Sustainability Index, the ISO 14000 series, the social accountability 8,000 standards, and the global reporting initiatives (GRI) (Zahid, et al., 2016). However, in this study sustainability reporting measurement is based on Bursa Malaysia sustainability Reporting Guide and Toolkits, in which guidelines for sustainability reporting is provided for public listed companies implementing sustainability management. It is a developed framework for sustainability assessment and reporting including the environmental, economic and social indicators. The beauty of Bursa Malaysia sustainability Reporting Guide and Toolkits is that for each sector a separate framework of sustainability reporting is developed which incorporate the social, economic, and environmental dimensions of sustainability. This study is based on energy sector specifically oil and gas industry, a checklist of 19 items are adopted and adapted from the sustainability guide and toolkit. The Bursa Malaysia sustainability Reporting Guide and Toolkits are used in this study because it is comprised of an internationally recognised framework GRI and additional indicators relevant to Malaysian environment. The

Total word count including tables and figures: 8965

combination of GRI and other indicators makes the Bursa Malaysia sustainability Reporting Guide and Toolkits more comprehensive to cover all aspects of reporting such as social, environmental, and economic performance. The sustainability approaches adopted by any industry or sector to which they belong must include these three dimensions (Gopalakrishnan et al., 2012). Economic aspects of sustainability reporting includes such as procurement practices, community investment and indirect economic impact), environmental aspects includes (such as emissions, raw materials, waste and effluent, water, energy, biodiversity, supply chain (environmental), product and services responsibility (environmental), and compliance (environmental) as well as social aspects such as diversity, human rights, occupational safety and health, anti-corruption, labour practices, product and services responsibility (social), bribery and corruption, and compliance (social). The total number of items per section can be seen from the Table 2, which is developed on the basis of guidelines and toolkit of Bursa Malaysia sustainability reporting for oil and gas industry.

Table 2: Bursa Malaysia Sustainability Reporting Guide and Toolkit Index for Oil and Gas Industry

Insert Table 2 here.

3. Methodology

The target population for this research is Malaysian oil and gas companies. The study proposed to collect data for five years over the period (2013 to 2017). Five years is chosen because this period coincided with the aftermath period of the new code on corporate governance, which was released in 2012 under the name Malaysian Code on Corporate Governance (MCCG 2012). The study will conduct content analysis of the annual reports to obtain information about companies' enterprise risk management practices and sustainability reporting. The annual reports will be sourced through the Bursa Malaysia's website as well as the websites of the respective companies. While secondary data related to the economic value added (EVA) measurement will be extracted from Thomson Reuters DataStream.

Census method is proposed because the sampling frame of the study is small. The sampling frame of this study consists of oil and gas public listed (41) companies in Bursa Malaysia. Census method is the method in which the study investigates every unit of the population. Census study ensures that no element of chance is left, and highest accuracy is obtained. One of the major advantages of census method is the accuracy as each unit of the population is studied before drawing any conclusions of the research. Many studies have recommended that census method is best suited for studies that have individual peoples or companies as unit of analysis. Similar study that had used the same approach include; Yegon, (2015) in the study on the effect of enterprise risk

management determinants on financial performance of listed firms in Kenya. The paper proposes ordinary least square (OLS) for the proposed analysis.

4. Theoretical Framework

This study hypothesises that to enhance the performance, the organisations need to have a proper risk management framework and its good relationships with various stakeholders. This study presents two theories: Stakeholder's Theory, pertinent with the concept of sustainability reporting, corporate social responsibility and corporate governance practices; and Modern Portfolio Theory (MPT) with an emphasis on the responsibility of management in selecting investments at the efficient frontier line and risk and returns trade-off. Further explanation of the relevant theories is given in the subsequent section.

4.1 Stakeholder Theory

Stakeholder theory claims that organisations main objective is to create and maximise stakeholder's value. Stakeholder theory postulates that within the organisations there are wider groups of stakeholders involved than only shareholders and investors. The essence of stakeholder theory is based on the general belief that the stakeholders are considered as an asset of an organisation and managers have to satisfy them (Zahid and Ghazali, 2017). All stakeholders such as shareholders, managers, employees, creditors, suppliers, customers, government agencies and local community can have interest in a business activities, objectives and behaviour (Aziz et al., 2015). All stakeholder expects from the organisation to disclose their activities and they have the right to get the information as for how organisational activities will influence them, even if they cannot directly play a positive role in the survival of the organisation. The satisfaction of multiple stakeholders increases the goodwill of an organisation. The organisation can maintain its status and reputation in society, which ultimately increases their value. The reporting on economic, environmental and social aspects determine that it accomplishes its part of the contract and that its activities match with the value systems of society and the environment. This can prevent regulatory compliance that would oblige the strategic requirements of an organisation. In the context of the stakeholder theory, it is established that the effective corporate risk management practices and sustainability reporting increase the oil and gas industry's economic value.

4.2 Modern Portfolio Theory

Markowitz is the founder of Modern Portfolio Theory (MPT). MPT was presented in 1952. It is a theory of investment emphasising risk and returns trade-off. It emphasised on the responsibility of management in selecting investments at an efficient frontier line which produces a higher return (Markowitz, 1952). Under

MPT risks are classified into systematic and unsystematic risks. Systematic risks are market-related risks and cannot be mitigated whereas, unsystematic risks can be managed through diversification (Aziz et al., 2015). Diversification or choosing a collection of assets has collectively lesser risk than any single asset. This is possible, in theory, as diverse assets values sometimes change in opposite ways. For instance, the price in stock market fluctuates at times with drops in stock market prices, and at other times the prices in the bond market rise, and vice versa. MPT has important implications in terms of risk minimisation by investing in portfolios that have lower overall risks. The MPT states that the business-specific risk management concept is not related shareholders value as shareholders are availed with two tools; asset allocation and diversification, to reduce overall risk (Markowitz, 1952). The companies should use risk management as the shareholders are not the only stakeholders of the organisation. It may be possibly favourable for an enterprise financial performance improvement as well as sustainable development.

5. Conceptual Framework

A conceptual framework is an analytical tool that logically integrates several variation and contexts of a concept to reach at a process that can provide the best possible explanation of the subject at stake (Kumar and Rao, 2015). Enterprise risk management (ERM) implementation and sustainability reporting are the most under-researched areas (Soomro and Lai, 2017). Despite the argumentation on the concept of ERM implementation and sustainability reporting, the regulatory compliance to adhere ERM and sustainability reporting in organisations, it becomes imperative to design a framework that can provide direction and guidelines to not only respond to the increasing expectations of the organisation's stakeholders but also enhance their overall performance. As noted above the theoretical arguments presented, which in particular takes reference from the value creation concept of enterprise risk management and sustainability reporting this research posits that implementation of ERM and sustainability reporting by an enterprise can create value. This study proposes a conceptual research model that consolidates enterprise risk management and sustainability reporting that could influence the performance of oil and gas companies. The proposed research model of the study is formulated by integrating ERM and sustainability reporting from previous research. The framework is composed of three groups of variables: independent, moderating, and dependent variables as shown in Figure 1. Independent variables are the main variable incorporating ERM Implementation, whereas the moderating variable is Sustainability Reporting practices, while the dependent variable is the Business Performance which will be measured by economic value-added (EVA) analysis. In the model, it is demonstrated that the independent variable ERM Implementation significantly affects the dependent variable, Business Performance.

Insert Figure 1 here.

Figure. 1: Conceptual Framework linking ERM, Sustainability Reporting Practices and Business Performance

It is theorised that the independent variables that are ERM Implementation could positively affect the Business Performance which is measured by EVA analysis. This study also hypothesised that sustainability reporting moderates the relationship between ERM Implementation and the Business Performance. Sustainability reporting as a moderating variable that accelerates the relationship between an independent and the dependent variable. The moderating variable, namely sustainability reporting helps increase resource use efficiency, greater adoption of clean and environmentally sound technologies and respond to the increasing expectation of all stakeholders. According to Zahid and Ghazali (2017), sustainability in the organisation is considered as a unique process of conducting business operations in a way to attain higher organisational performance. It also builds the goodwill of the business in the eyes of stakeholders and leads to a better decision making. A better decision making, in turn, leads to a better implementation of risk management framework. The better risk management framework improves the overall economic value of the organisation.

6. Future Research

Future studies can empirically test and validate our proposed conceptual framework. The authors anticipate future studies to test the conceptual model in different industries and countries. For instance, the proposed conceptual framework of this study can be tested in different domains and with larger sample size. This will help to generalise the framework and shed more light on the impact of ERM implementation and sustainability reporting practices on the value of the organisation in order to create and sustain a competitive advantage. Even though the relationships constructed between the independent and dependent variables in our proposed conceptual model is supported by many studies, the integration of moderator specifically, sustainability reporting has not been investigated so far. Future studies should examine sustainability reporting itself and its further dimensions specifically the economic, environmental and social sustainability reporting in order to get fruitful theoretical and empirical direction and significance for this particular area of research. Also, quantitative and qualitative methodologies could be used to study the relationships between ERM implementation (COSO 2004 ERM framework) and business performance with the moderating effect of sustainability reporting. To empirically analyse the data future studies should consider the use of Structural Equation Modelling (SEM) either variance-based SEM (PLS) or covariance-based SEM for assisting in design issues and choice of statistical methodology. Additionally, this study will also be useful for *Academics* to conduct research and analysis in order to find out where future enhancements can be made to the corporate

governance practices, ERM implementation, sustainability reporting practices, as well as value-based measurement analysis of the organisations.

7. Conclusion

This paper presents a conceptual framework that examines the moderating effect of sustainability reporting practices onto the relationship between ERM implementation and business performance measured through economic value added (EVA) analysis. Previous studies albeit limited showed that there is an evidence that ERM implementation and sustainability reporting in organisations promotes competitiveness and enhances an enterprise value. Petroleum companies can put in place ERM framework, to attain cleaner and sustainable operations. The proposed conceptual framework in this study will have some potential important implications. Firstly, the proposed model that will be helpful to top management to appreciate the effect of holistic ERM framework for the oil and gas companies. The highlighted model may lend reference to the oil and gas companies to appreciate and identify the strategic factors and serve as an important conduit to enhance their economic value. Secondly, this paper attempts to link the importance of sustainable business practices responding to the increasing expectations of the stakeholders. This study explored sustainability reporting practices in oil and gas industry, with a special focus on the economic, environmental and social sustainability reporting. This paper hypothesises sustainability reporting as a moderator between ERM implementation and business performance relationship. The integration of ERM implementation and sustainability reporting assists organisations in the improvement of price to earnings ratios and the cost reduction of capital through reducing information asymmetry among the business, the insurance companies, the lenders and the shareholders of the company. This could contribute to the nation's sustainability in terms of its economic, social and environmental well-being. This, in turn, will assist the government in achieving its target of making Malaysia to become an advanced economy by 2020 within resilient, low carbon emissions, resource-efficient, and socially-inclusive manner. This study can also offer a source of reference to *Financial Analysts, Risk Managers, Rating Agencies and Industry Practitioners* on ERM implementation and sustainability reporting.

Acknowledgements

The authors would like to thank Management and Humanities Department of Universiti Teknologi PETRONAS, Marine Department Malaysia and to the EU project Sustainable Process Integration Laboratory – SPIL, funded as project No. CZ.02.1.01/0.0/0.0/15_003/0000456, by Czech Republic Operational Programme Research and Development, Education, Priority 1: Strengthening capacity for quality research.

References

- Adam, I. S. (2014). An empirical investigation of the efficiency, effectiveness and economy of the Nigerian National Petroleum Corporation's management of Nigeria's upstream petroleum sector. *OpenAIR@RGU* <openair.rgu.ac.uk> accessed 01.05.2018.
- Agustina, L. and Baroroh, N., 2016. The relationship between enterprise risk management (ERM) and business value mediated through the financial performance. *Review of Integrative Business & Economics Research*, 5(1), pp.128-138.
- Ahmed, I. and Manab, N. A. (2016). Moderating role of board equity ownership on the relationship between enterprise risk management implementation and business's performance: A proposed model. *International Journal of Management Research and Reviews*, 6(1), 21.
- Aman, Z., Ismail, S., and Bakar, N. S. (2015). Corporate Sustainability Reporting: Malaysian Evidence. *Proceeding of the 2nd International Conference on Management and Muamalah*, Selangor, Malaysia.
- Aras, G., Tezcan, N., and Kutlu Furtuna, O. (2018). Multidimensional comprehensive corporate sustainability performance evaluation model: Evidence from an emerging market banking sector. *Journal of Cleaner Production*, 185, 600-609.
- Aziz, N. A. A., Manab, N. A. and Othman, S. N. (2015). Exploring the perspectives of corporate governance and theories on sustainability risk management (SRM). *Asian Economic and Financial Review*, 5(10), 1148.
- Baron, R. M. and Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173.
- Callahan, C. and Soileau, J., 2017. Does Enterprise risk management enhance operating performance? *Advances in Accounting*, 37, pp.122-139.
- Carvalho, M.M.D. and Rabechini Junior, R., 2015. Impact of risk management on project performance: the importance of soft skills. *International Journal of Production Research*, 53(2), pp.321-340.
- 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.
- Chakravarthy, B. S. (1986). Measuring strategic performance. *Strategic Management Journal*, 7(5), 437-458.
- COSO. (2004). Enterprise risk management framework”, Committee of Sponsoring Organisations of the Treadway Commission <www.erm.coso.org> accessed 02.05.2018.
- COSO. (2017). Enterprise risk management integrating with strategy and performance. <www.erm.coso.org> accessed 02.05.2018. (pp. 1-10): Committee of Sponsoring Organisations of the Treadway Commission.

Total word count including tables and figures: 8965

- Dabari, I. J. and Saidin, S. Z. (2014). A theoretical framework on the level of risk management implementation in the Nigerian banking sector: The moderating effect of top management support. *Procedia-Social and Behavioural Sciences*, 164, 627-634.
- Dabari, I. J. and Saidin, S. Z. (2016). A moderating role of board characteristics on enterprise risk management implementation: Evidence from the Nigerian banking sector. *International Journal of Economics and Financial Issues*, 6(4S).
- Ermenc, A., Klemenčič, M., and Rejc Buhovac, A. (2017). Sustainability reporting in Slovenia: Does sustainability reporting impact financial performance? In *sustainability reporting in Central and Eastern European companies: International empirical insights* (pp. 181-197). Cham, Switzerland: Springer International Publishing.
- Ehrbar, A. (1999). Using EVA to measure performance and assess strategy. *Strategy & Leadership*, 27(3), 20-24.
- Eikenhout, L. (2015). Risk management and performance in insurance companies. (Master Dissertation) The University of Twente. Enschede, Netherlands.
- Florio, C. and Leoni, G. (2017). Enterprise risk management and business performance: The Italian case. *The British Accounting Review*, 49(1), 56-74.
- Freeman, R. E. (1983). Strategic management: A stakeholder approach. *Advances in Strategic Management*, 1(1), 31-60.
- Garcia Z. E., Gonzalez, B., Oscar, and Munoz, G. P. A., (2013). Organisational and environmental factors as moderators of the relationship between multidimensional innovation and performance. *Innovation*, 15(2), 224-244.
- Gatignon, H., and Xuereb, J. M. (1997). Strategic orientation of the business and new product performance. *Journal of Marketing Research*, 77-90.
- Gopalakrishnan, K., Yusuf, Y. Y., Musa, A., Abubakar, T., and Ambursa, H. M., (2012). Sustainable supply chain management: A case study of British Aerospace Systems. *International Journal of Production Economics*, 140(1), 193-203.
- Greiling, D. and Grüb, B. (2014). Sustainability reporting in Austrian and German local public enterprises. *Journal of Economic Policy Reform*, 17(3), 209-223. doi: 10.1080/17487870.2014.909315
- Hoyt, R. E. and Liebenberg, A. P. (2011). The value of enterprise risk management. *Journal of Risk and Insurance*, 78(4), 795-822.
- Kaplan, R. S. and Norton, D. P. (1996). *The balanced scorecard: translating strategy into action*: Harvard Business Press, Boston, MA, USA.
- Kasbun, N. F., Teh, B. H., and Ong, T. S. (2016). Sustainability reporting and financial performance of Malaysian public listed companies. *Institutions and Economics (formerly International Journal of Institutions and Economics)*, 8(4), 78-93.

Total word count including tables and figures: 8965

- Kasbun, N. F., Teh, B. H., and San Ong, T. (2017). Sustainability reporting and financial performance of Malaysian public listed companies. *Institutions and Economies*, 8(4), 78-93.
- Khan, S. N., and Ali, E. I. E. (2017). The moderating role of intellectual capital between enterprise risk management and business performance: A conceptual review. *American Journal of Social Sciences and Humanities*, 2(1), 9-15.
- Krenchovská, M., and Procházková, P. T. (2014). Sustainability and its integration into corporate governance focusing on corporate performance management and reporting. *Procedia Engineering*, 69, 1144-1151.
- Kumar, S., and Rao, P. (2015). A conceptual framework for identifying financing preferences of SMEs. *Small Enterprise Research*, 22(1), 99-112.
- Kvach, N. M. and Il'ina, N. A. (2013). Use of the concept of "Economic Value Added" to evaluate the performance of an organisation. *Fibre Chemistry*, 45(4), 252-257. doi: 10.1007/s10692-013-9522-0
- Lai, F. W., Azizan, N. A., and Samad, M. F. A. (2010). Shareholders value creation through enterprise risk management. *International Journal of Business Research*, 10(1), 44-57.
- Lai, F. W., Azizan, N. A., and Samad, M. F. A. (2011). A strategic framework for value enhancing enterprise risk management. *Journal of Global Business and Economics*, 2(1), 23-47.
- Lai, F. W., and Shad, M. K. (2017). Economic value added analysis for enterprise risk management. *Global Business and Management Research*, 9(1s), 338.
- Lechner, P., and Gatzert, N. (2017). Determinants and value of enterprise risk management: empirical evidence from Germany. *The European Journal of Finance*, 1-27. doi: 10.1080/1351847X.2017.1347100
- Liew, K. C., and Lee, C. K. M. (2012). Modelling and risk management in the offshore and marine industry supply chain. *International Journal of Engineering Business Management*, 4, 2. doi: 10.5772/45738
- Low, S. P., Liu, J. Y., Ng, S. H. M., and Liu, X. (2013). Enterprise risk management and the performance of local contractors in Singapore. *International Journal of Construction Management*, 13(2), 27-41. doi: 10.1080/15623599.2013.10773210
- Maletič, M., Maletič, D., and Gomišček, B. (2018). The role of contingency factors on the relationship between sustainability practices and organizational performance. *Journal of Cleaner Production*, 171, 423-433.
- Markowitz, H. (1952). Portfolio selection. *The Journal of Finance*, 7(1), 77-91.
- McShane, M. K., Nair, A., and Rustambekov, E. (2011). Does enterprise risk management increase business value? *Journal of Accounting, Auditing and Finance*, 26(4), 641-658. doi: 10.1177/0148558x11409160
- Niemann, L. and Hoppe, T. (2017). Sustainability reporting by local governments: a magic tool? Lessons on use and usefulness from European pioneers. *Public Management Review*, 1-23. doi: 10.1080/14719037.2017.1293149

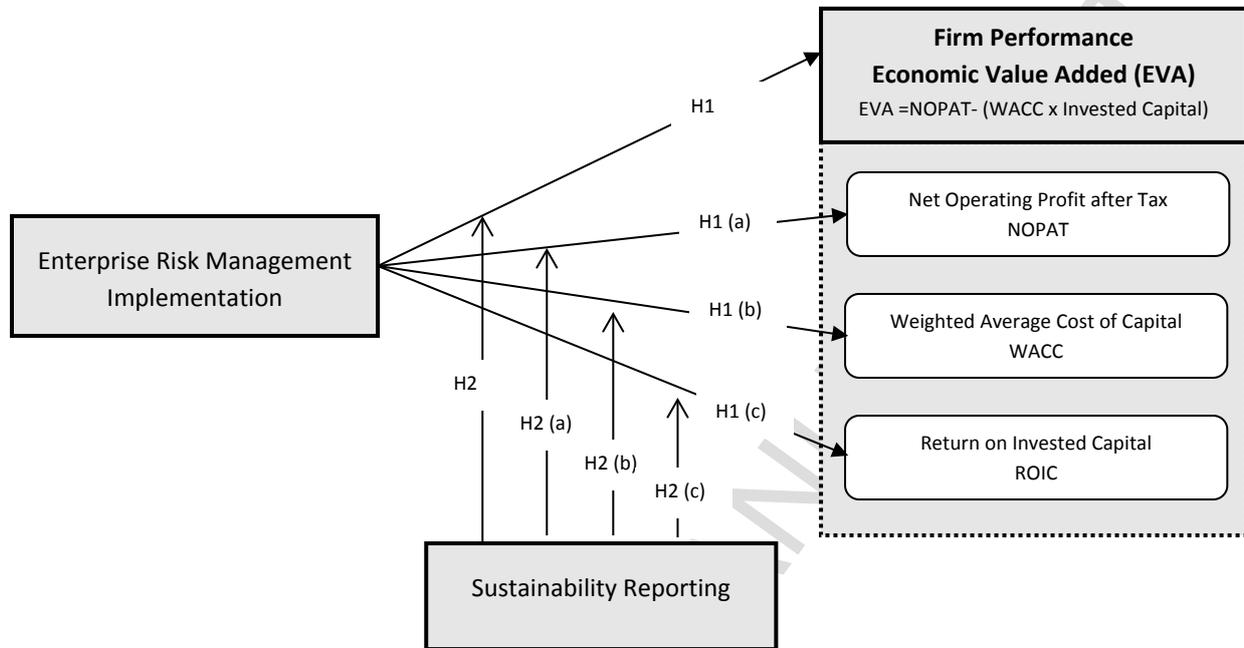
- Nocco, B. W. and Stulz, R. M. (2006). Enterprise risk management: Theory and practice. *Journal of applied corporate finance*, 18(4), 8-20.
- Olawumi, T. O., and Chan, D. W. M. (2018). A scientometric review of global research on sustainability and sustainable development. *Journal of Cleaner Production*, 183, 231-250.
- Pagach, D. and Warr, R. (2011). The characteristics of businesses that hire chief risk officers. *Journal of risk and insurance*, 78(1), 185-211.
- Ping, T. A. and Muthuveloo, R. (2015). The impact of enterprise risk management on business performance: Evidence from Malaysia. *Asian Social Science*, 11(22), 149.
- Power, M. (2009). The risk management of nothing. *Accounting, Organisations and Society*, 34(6), 849-855.
- Quon, T. K., Zéghal, D. and Maingot, M. (2012). Enterprise risk management and business performance during the financial and economic crises. *Problems and Perspectives in Management*, 10(3), 95-103.
- Richard, P. J., Devinney, T. M., Yip, G. S. and Johnson, G. (2009). Measuring organisational performance: Towards methodological best practice. *Journal of Management*, 35(3), 718-804.
- Rostamzadeh, R., Ghorabae, M. K., Govindan, K., Esmaili, A., and Nobar, H. B. K. (2018). Evaluation of sustainable supply chain risk management using an integrated fuzzy TOPSIS- CRITIC approach. *Journal of Cleaner Production*, 175, 651-669.
- Salih, O. M., Hamzah, N. and Maelah, R. (2016). The moderating effect of human capital on the relationship between enterprise risk management pillars and performance. 8th International Management and Accounting Conference (IMAC8), Langkawi, Malaysia, 483-491
- Schiller, F., and Prpich, G. (2014). Learning to organise risk management in organisations: what future for enterprise risk management? *Journal of Risk Research*, 17(8), 999-1017. doi: 10.1080/13669877.2013.841725
- Selvarajan, T., Ramamoorthy, N., Flood, P. C., Guthrie, J. P., MacCurtain, S. and Liu, W. (2007). The role of human capital philosophy in promoting business innovativeness and performance: Test of a causal model. *The International Journal of Human Resource Management*, 18(8), 1456-1470.
- Shad, M. K., and Lai, F.-W. (2015a). Enterprise risk management and business performance validated through economic value added factors. *International Journal of Economics and Statistics*, 3, 148-154.
- Shad, M. K. and Lai, F.-W. (2015b). A conceptual framework for enterprise risk management performance measure through economic value added. *Global Business and Management Research*, 7(2), 1.
- Soomro, M. A. and Lai, F.-W. (2017). Examining a new paradigm of enterprise sustainability risk management. *Global Business and Management Research*, 9(1), p328-337. 10p.
- Stern, J. M., Stewart, G. B. and Chew, D. H. (1995). The EVA® financial management system. *Journal of Applied Corporate Finance*, 8(2), 32-46.

Total word count including tables and figures: 8965

- Subramaniam, N., Wahyuni, D., Cooper, B. J., Leung, P., and Wines, G. (2015). Integration of carbon risks and opportunities in enterprise risk management systems: evidence from Australian firms. *Journal of Cleaner Production*, 96, 407-417.
- Tahir, I. M. and Razali, A. R. (2011). The Relationship between enterprise risk management (ERM) and business value: Evidence from Malaysian public listed companies. *International Journal of Economics and Management Sciences*, 1(2), 32-41.
- Tavakoli, S. and Talib, N. A. (2014). A comprehensive approach to relationship between COSO ERM and business performance in construction industry. *International Research Journal of Applied and Basic Sciences*. 8(12), 2214-2220.
- Waweru, N. and Kisaka, E. (2013). The effect of enterprise risk management implementation on the value of companies listed on the Nairobi stock exchange. *Journal of Applied Finance and Banking*, 3(3), 81- 105.
- Wu, Y., Marshall, A., Chipulu, M., Li, Q., Chipulu, M. and Ojiako, U. (2014). Enterprise risk management and business value within China's insurance industry. *Professional Accountant*, 14(1), 1-10.
- Yegon, C. K. (2015). Effect of enterprise risk management determinants on financial performance of listed firms in Kenya. (PhD), Jomo Kenyatta University of agriculture and technology.
- Zahid M., Ghazali Z. and Rahman, H. U. (2016). Corporate sustainability practices and reporting: A case of Malaysian REITS and property listed companies. *International Journal of Economics and Financial Issues*, 6(2).
- Zahid, M. and Ghazali, Z. (2017). Corporate sustainability practices and business's financial performance: The driving force of integrated management system. *Global Business and Management Research*, 9(1s), 479.
- Zou, X., Isa, C. R. and Rahman, M. (2017). Valuation of enterprise risk management in the manufacturing industry. *Total Quality Management and Business Excellence*, 1-22. doi: 10.1080/14783363.2017.1369877

List of Figure Captions

Figure 1. Conceptual Framework linking ERM, Sustainability Reporting Practices and Firm Performance



Highlights

- Moderating effect of sustainability examined by conceptual framework.
- ERM implementation and business performance measured through economic value added analysis.
- Petroleum companies can put in place ERM framework, to attain cleaner and sustainable operations.
- This paper hypothesises sustainability reporting as a moderator between ERM implementation and business performance relationship.

List of Table Captions

Table 1: Enterprise Risk Management and Firm Performance Related Empirical Studies

| Author/Year | Objective | Research Method | ERM Proxy | Data Source and Study Period | Firm Performance Proxy | Results Summary | Effect |
|------------------------------|--|--|--|--|--|---|----------|
| (Florio and Leoni, 2017) | Investigates ERM adoption and the performance of Italian listed companies. | <ul style="list-style-type: none"> Annual Reports manual content analysis AIDA and Bloomberg database Multivariate OLS regressions | ERM activity, (ERM, CRO, risk committee etc.) | 2011 to 2013 Non-financial companies listed on the Milan Stock Exchange | ROA For Financial performance and Tobin's Q for Market Performance | Organization with higher level of ERM adoption have higher performance, both as financial performance and market performance. | Positive |
| (Callahan and Soileau, 2017) | Examine ERM processes and operational performance | <ul style="list-style-type: none"> On-line survey Questionnaire COMPUSTAT database. Correlation Analysis Regression Analysis | ERM activity (survey) | 2006 to 2008 1631 US companies. | Operating Performance (ROA and ROE) | A positive relationship between ERM maturity and industry-adjusted operating performance is found | Positive |
| (Lechner and Gatzert, 2017) | <ul style="list-style-type: none"> Examine firm characteristics that determine ERM adoption Impact of ERM on firm value. | <ul style="list-style-type: none"> Descriptive Statistics Pearson and spearman's correlation analysis Regression Analysis | Keyword Search. ERM, Risk Committee, CRO Hiring | 2009-2013 160 Companies listed on the German stock exchange | Tobin's Q | <ul style="list-style-type: none"> Size, International diversification and the industry sector has positive influence on ERM. Results show a positive effect of ERM on performance. | Positive |
| (Lai and Shad, 2017) | Impact of ERM on firm's value | <ul style="list-style-type: none"> Questionnaire Survey Regression Analysis | ERM Subjective Measure | 2009-2014 120 Malaysian PLCs | Subjective Measures | <ul style="list-style-type: none"> ERM implementation has significant positive impact in reducing the WACC and increasing the NOPAT and ROIC | Positive |
| (Agustina and Baroroh, 2016) | Influence of ERM on firm value mediated through its financial performance | <ul style="list-style-type: none"> Annual Reports Descriptive Statistics and Regression Analysis | ERM proxy is based on guidelines of risk management for commercial banks | (2011-2013) 53 Banks listed on Indonesia Stock Exchange | Price to Book Value (PBV) and the ROE | <ul style="list-style-type: none"> ERM has no significant effect on firm performance. | Negative |
| (Eikenhout, 2015) | ERM and its effect on Performance, before and during the Financial Crisis of 2007 and 2008 | <ul style="list-style-type: none"> Annual Reports and ORBIS Database Regression Analysis t-tests | CRO appointment key Words search | Pre-crisis 2005 and 2006 and Crisis period 2007 and 2008. 39 Insurance Companies in the Netherlands | ROA and the ROE | <ul style="list-style-type: none"> No significant relationship was found. | Negative |

| | | | | | | | |
|-----------------------------|--|---|---|---|--|--|-----------------------------------|
| (Ping and Muthuveloo, 2015) | <ul style="list-style-type: none"> Impact of ERM on Firm value Moderating Role of BOD's monitoring, firm complexity and firm size on ERM and Firm Performance Relationship | <ul style="list-style-type: none"> Questionnaire survey Partial Least Squares and Structural Equation Modeling Tool | COSO ERM Model's eight components. | Target population 800 Malaysian Public Listed Companies (PLCs) | Financial and non-Financial Measures | <ul style="list-style-type: none"> Significant positive influence on firm performance BOD's monitoring, firm size and firm complexity have positive effect in moderating the relationship between ERM and Performance. | Positive |
| (Wu et al., 2014) | Scrutinize the Relationship between ERM and Firm Value | Ordinary Least Squares (OLS) Modelling, | ERM Subjective Measure | (2010) 135 Chinese insurance companies | Return on Equity (ROE) | <ul style="list-style-type: none"> A Positive association between ERM and Firm performance. | Positive |
| (Low et al., 2013) | Effect of ERM on the Singaporean Construction Industry. | <ul style="list-style-type: none"> Questionnaire-based Survey Descriptive Statistics and One Sample t-test | ERM Subjective Measure | Pilot Study 60 questionnaires distributed to Singaporean contractors | 10 Performance Indicators were used to Proxy Performance | <ul style="list-style-type: none"> Yes, apart from health, 10 selected Performance Indicators have benefited from ERM. | Positive |
| (Lai et al., 2011) | Impact of ERM implementation on shareholders' value enhancement. | <ul style="list-style-type: none"> Questionnaire-based Survey Correlation Analysis Regression Analysis | ERM Subjective Measures | 2009-2011 120 PLCs Malaysia | Shareholders Value Measured on Likert Scale | <ul style="list-style-type: none"> ERM adoption contributed to the reduction of cost of capital and enhancement of firm's value. | Positive |
| (McShane et al., 2011) | Investigate the association between ERM adoption and firm value. | <ul style="list-style-type: none"> OLS regression | S&P ERM rating (5 categories) | 2008 152 US insurance firms | Tobin's Q | <ul style="list-style-type: none"> Weak ERM ratings (for the scores 1, 2 and 3) has a negative effect on firm value. | Positive (only for improving TRM) |
| (Pagach and Warr, 2011) | Impact of ERM adoption on firms' long-term performance | <ul style="list-style-type: none"> Descriptive Statistics Pearson correlation coefficients Regression Analysis | Keyword Search. ERM, Risk Committee, CRO Hiring | 106 US Insurance Companies | Share Price Return on Equity (ROE) | <ul style="list-style-type: none"> The negative relationship between the change in firms' market to book ratio and earnings volatility. | Negative |

Table 2: Bursa Malaysia Sustainability Reporting Guide and Toolkits for Oil and Gas Sector

| Sustainability Reporting Indicators for Oil and Gas Industry | | |
|---|---|---|
| Economic | Environmental | Social |
| <ul style="list-style-type: none"> • Procurement practices • Community investment • Indirect economic impact | <ul style="list-style-type: none"> • Emissions • Waste and effluent • Water • Energy • Biodiversity • Supply Chain (Environmental) • Product and Services Responsibility (Environmental) • Compliance (Environmental) | <ul style="list-style-type: none"> • Diversity • Human Rights • Occupational Safety and Health • Anti-corruption • Labor practices • Society • Product and Services Responsibility (Social) • Compliance (Social) |