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Depth penetration of enterprise risk management model in Malaysian government sector

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Abstract: With the worsening of operating environment due to intense competition brought about by globalisation and market liberalisation, the risks faced by corporate Malaysia have been fierce and getting more complex. Motivated from this issue, we conducted a research to investigate the awareness and depth penetration of Enterprise Risk Management (ERM) in Malaysian Government agencies. After knowing the level of risk management in every sector we can start to implement ERM in every government sectors to reduce their risk and achieve target to have efficient and transparent government. We surveyed the profile and commitment of Public Sectors in Malaysia to ERM practices and used factor analysis and regression analysis to determine the intensity, challenges and benefits of ERM implementation in government sectors. Our finding suggested that implementation of ERM in public sectors can increase the performance and corporate governance of the Malaysian government.

Keywords: Asian; ERM; government; governance; Malaysia.

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1 Introduction

The recent economic turmoil continues to draw significant attention to the multitude of risks organisations face as they pursue strategic goals. In some instances, risks far exceeded the organisation's appetite and ability to bear those risks, ultimately threatening its sustainability. In response, numerous calls have been issued for organisational leaders, including senior executives and their boards, to engage in a fundamental review of how the organisation approaches its management of risks and to immediately address any deficiencies in risk oversight. While much of the attention on strengthening risk oversight is aimed at the corporate sector, the need for robust enterprise risk oversight is relevant to all types and sizes of organisations, including governmental entities. Why? No organisation is immune to risks affecting the entity's existence and its ability to fulfill mission critical objectives.

Furthermore, increased funding approved by Cabinet related to the economic bailout and federal stimulus initiatives are being funnelled through federal, state and local governmental agencies at record levels and at a rapid pace, thereby creating unique challenges — and sometimes, new types of risks — for government agency leaders as they oversee these new programmes. Public awareness and skepticism regarding how these agencies are overseeing these new (and sometimes unfamiliar) initiatives are at all-time high, thereby increasing risks for governmental leaders. As Malaysia is going to high-income economy, government leaders should be aware of the risks involved in every organisations and how to treat these risks as government sectors are going for more challenging phase. In order to achieve these objectives leaders of government sectors should be aware of the risks involved in their organisations and come with the solutions to reduce or turn these risks to opportunities.

Motivate from this issue, we conducted a research to investigate the awareness and depth penetration of Enterprise Risk Management (ERM) in Malaysian Government agencies. After knowing the level of risk management in every sector we can start to implement ERM in every government sectors to reduce their risk and achieve target to have efficient and transparence government. With efficient and transparent government, Malaysia can have strong financial stability and can sustain any economic shock if all the resources are well managed.

The 1997–1998 Asian Financial Crisis has exposed the internal vulnerability of corporate Malaysia in weathering external shocks. With the expected worsening of operating environment due to intense competition brought about by globalisation and market liberalisation, as well as unpredictable market conditions and future economic performances due to the volatility of petroleum prices and the aftermath of terrorist attacks in New York and London, the risks faced by corporate Malaysia have been fierce and getting more complex. This is especially so with the fact that Malaysia has a very open economy with its total trade volume amounting to twice of its annual Growth Domestic Product (GDP). The country's total trade in 2006 exceeded one trillion ringgit mark with RM589 billion (US$168 billion) in exports and RM481 billion (US$137 billion) in imports (The Associated Press, 2007). This signifies that companies operating in Malaysia are exposed and susceptible to various forms of shocks, internally or externally, in the nature of economic, political, religious, cultural, technology, natural disaster etc.

It is worth noting, however, that the practice of corporate risk management in the Malaysian environment resides within the bigger realm of corporate governance regime as far as the regulatory framework is concerned. The regulatory requirements for corporate governance practice to a large extent are more in the nature of 'guidelines' and 'best practice'. These approaches do not render that severe of a regulatory implication, should there be any breach in compliance as compared to laws such as the Sarbane–Oxley Act (SOX) enforced in the USA. According to the law of SOX, company officials such as CEOs, financial controllers and external auditors are required to sign-off financial statements issued to the public to ensure the validity and accuracy of all the information therein contained. Failing which, harsh punishment including imprisonment awaits them. Such is the severity of the consequence of the breach of SOX law that corporate risk management becomes a crucial and integral part of the day-to-day managerial function among Corporate USA.

This paper discusses on the research conducted to investigate ERM and its impact on public sectors performance in Malaysia. The researchers used an empirical approach (quantitative) to test on several hypotheses in this respect.

Specifically, this study has three aims: (a) to examine the depth of penetration of ERM practices among Malaysian public sectors, (b) to identify the key factors for the following constructs: *ERM challenges, ERM benefits, business performance* and *corporate value* and (c) to investigate whether ERM practices will affect public sectors performance.

2 Literature review

The review of the literature showed that there was very little empirical research on corporate risk management to address firm-specific risk. Most of the literature discussed ways to reduce systematic risk or market risk, i.e. financial risk, faced by financial institutions such as banks and insurance companies. Only recently, a new concept called ERM emerged in an attempt to fill the deficiency of addressing firm-specific risk of corporations by offering a holistic approach to Enterprise-Wide Risk Management (EWRM).

Chapman (2003) defined ERM as the process of identifying and analysing risk from an integrated, company-wide perspective. On the other hand, Meager and O'Neil (2000) described EWRM as a structured and disciplined approach in aligning strategy, processes, people, technology and knowledge with a purpose of evaluating and managing the uncertainties the enterprise faces as it creates value. Stoke (2004) added that by taking a more holistic, top-down approach to risk strategy and appetite, companies can focus their attention on most significant threats to business objectives and achieve even greater value from risk management.

In the context of this study, the operational meaning of ERM is defined by the extent of risk management practices carried out in an organisation which include the following attributes: provision of common terminology and setting of standards of risk management, provision of enterprise-wide information about risk, integrating risk with corporate strategic planning, quantifying risk to the greatest extent possible, integrating risk management in all functions and business units, enabling all staff to understand his/her accountability in risk management initiatives.

Proponents of ERM suggest that a dynamic model of ERM may contribute in reducing firm-specific risk in order to maximise corporate value. They argue that an integrated approach of risk management increases firm value by reducing inefficiencies inherent in the traditional approach, improving capital efficiency, stabilising earnings and reducing the expected costs of external capital and regulatory scrutiny (Liebenberg and Hoyt, 2003). Bierc (2003) introduced a similar concept and called it Strategy Risk Management (SRM). According to Bierc (2003), SRM should be developed and pursued with substantial regard to the key drivers that would impact success and value of a corporation. It should keep an organisation focused on the things that drive success, providing tools that effectively measure 'execution'. All these propositions make up the *value maximisation hypotheses* of corporate risk management.

3 Methodology

The target populations are the public sectors in Malaysia. There are 25 ministries under the government of Malaysia. The sampling elements were senior officials of the sampled companies who have had at least some experiences in their enterprises' risk management initiatives. The positions of the respondents include director, general manager, financial controller/CFO, COO, senior manager and manager

The structured questionnaire contained two sections. The first section was used to gather background information about the respondents and their companies. There were 18 items in this part. The second section of the questionnaire was used to gauge the various aspects of ERM practices by the companies, the critical success factors for ERM implementation, business performance and corporate risk profile. The second section contained ten sub-sections with a total of 76 items.

In surveying the profile and commitment of corporate Malaysia to ERM practices, this paper adapted the PricewaterhouseCoopers' 7th Annual Global CEO Survey on ERM. This paper also adapted Al-Mashari and Zairi's (1999) model in scrutinising the critical success factors for ERM implementation. Tables 1 and 2 depict some of the sections and items that were captured in the structured questionnaire sent to the respondents that were relevant to the analysis in this paper.

Table 1 Dimensions and variables for depth of ERM practices

Which elements found or impacts resulted from your enterprise's risk management process	
B1 Common terminology and set of standards	B6 Quantified to the greatest extent possible
B2 Enterprise-level information	B7 Integrated across all functions and business units
B3 Integrated with strategic planning	B8 Everyone understand his/her accountability
B4 Reduced risk of non-compliance	
B5 Can track costs of compliance	

What are the challenges in ERM implementation	
C1 People	C6 Discrepancy between expectation/practice
C2 Timeliness of information	C7 Technology
C3 Availability of information	C8 Organisational structure
C4 Over-regulation	C9 Necessary level of investment
C5 Competition	

What benefits are derived from ERM implementation	
D1 Enhances enterprise's ability to take appropriate risks in value creation	D7 Reporting to regulators
D2 CEO confidence in business operations	D8 Communicating to Stakeholders/ Shareholders
D3 Creating smooth governance procedures	D9 CEO's ability to think entrepreneurially and innovatively
D4 Monitoring performance	D10 Profitability
D5 Reputation	D11 Meeting strategic goals
D6 Clarity of organisation-wide decision making and chain of command	

Notes: Adapted from PricewaterhouseCooper's 7th Annual Global CEO Survey on enterprise risk management.

4 Analysis and discussion

4.1 Reliability test

There are three constructs (scales) involved in the analysis, namely ERM intensity, ERM benefit, and ERM challenge. All of the three constructs' scales were tested for their internal consistency reliability. Table 2 shows the results of reliability analysis with the Cronbach's alpha scores for the respective construct scale measured by the various items.

All the alpha coefficients are above 0.6, indicating satisfactory internal consistency reliability of the summated scale of several items for each construct (Malhotra, 2004).

Table 2 Reliability analysis of construct scales

Construct/Scale	*Number of Items*	*Cronbach's α*
ERM Intensity	13	0.969
ERM Benefit	13	0.971
ERM Challenge	9	0.918

4.2 Factor analysis

Factor analysis deals with extraction of factors from a matrix of associations between variables under study. Exploratory Factor Analysis (EFA) investigates 'possible relationships in only the most general form and then allows the multivariate technique to estimate relationships'. EFA is performed to establish a factor model from a set of variables to identify the underlying "structure of relationships between either variables or respondents" (Hair et al., 1998, p.95).

Prior to performing factor analysis, Bartlett's Test of Sphericity (BTS) was deployed to test the appropriateness of the factor model from the data set and Kaiser-Meyer-Olkin (KMO) test was executed to measure sampling adequacy for factor analysis. A value greater than 0.5 is desirable for the KMO test (Malhotra, 2004).

Table 3 shows the results of BTS and KMO tests on the three constructs, i.e. *ERM intensity*, *ERM benefits*, and *ERM challenge*. The results from BTS tests conclude that the respective variables in each construct are highly correlated in the population (BTS) where the null hypothesis that the variables are uncorrelated in the population was rejected. In addition, results from KMO tests also indicate that factor analysis is an appropriate technique for analysing the correlation matrix among variables in each attribute (value > 5). Principal Component Factor (PCF) analysis using varimax rotation procedure was performed to determine the minimum number of factors that will account for maximum variance in each of the four attributes; i.e *ERM intensity*, *ERM benefit*, and *ERM challenge*.

Table 3 Bartlett's Test of Sphericity (BTS) and Kaiser-Meyer-Olkin (KMO) test results

Attributes	*Bartlett's Test of Sphericity*	*KMO*
ERM Intensity	0.000*	0.759
ERM Benefit	0.000*	0.796
ERM Challenge	0.000*	0.672

Note: *Significant at 1% = 0.01.

Table 4 shows the number of factors, eigenvalue, percentage of variance and variable loadings as the result of the PCF analysis. Results indicate that PCF analysis yields 2 factors each on *ERM intensity*, *ERM benefit*, and *ERM challenge*, respectively. The two factors for each construct cumulatively account for 82.91%, 84.97% and 76.75% of the total variance of the constructs (*ERM intensity*, *ERM benefit*, and *ERM challenge*), respectively.

Table 4 Principal component factor analysis using varimax rotation procedure

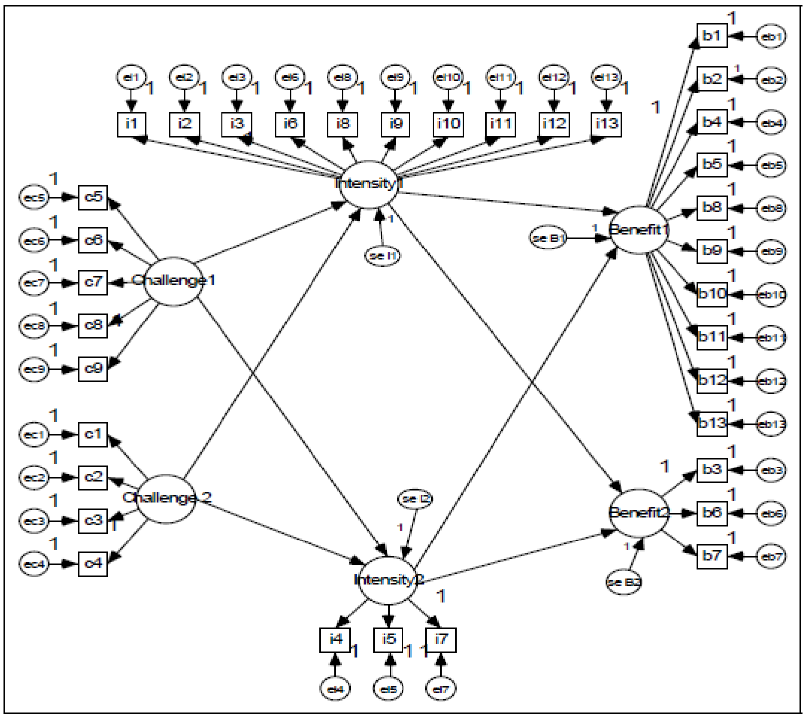
Attributes/Constructs	*Factor*	*Eigenvalue*	*% of Variance*	*Variables (loadings)*
ERM Intensity	1	9.667	55.158	i1 (0.831)
				i2 (0.918)
				i3 (0.871)
				i6 (0.861)
				i8 (0.739)
				i9 (0.829)
				i10 (0.613)
				i11 (0.689)
				i12 0.889)
				i13 (0.929)
	2	1.111	27.750	i4 (0.862)
				i5 (0.830)
				i7 (0.873)
ERM Benefit	1	9.817	55.430	b1 (0.821)
				b2 (0.858)
				b4 (0.892)
				b5 (0.842)
				b8 (0.837)
				b9 (0.835)
				b10 (0.653)
				b11 (0.796)
				b12 (0.869)
				b13 (0.855)
	2	1.228	29.538	b3 (0.875)
				b6 (0.913)
				b7 (0.899)
ERM Challenge	1	5.499	40.038	C5 (0.813)
				C6 (0.711)
				C7 (0.580)
				C8 (0.936)
				C9 (0.806)
	2	1.409	36.716	C1 (0.858)
				C2 (0.916)
				C3 (0.873)
				C4 (0.665)

4.3 Multiple regression analysis

4.3.1 Path diagram

Based on the results of PCF analysis performed, a path diagram for the various multiple regression models is developed as depicted in Figure 1.

Figure 1 Path diagram of multiple regression model



Based on the above path diagram, four multiple regression equations have been developed taking the generic form of $\hat{Y} = a + b_1X_1 + b_2X_2$. The four multiple regression equations are:

Benefit1 = Intensity1 + Inensity2
Benefit2 = Inensity1 + Intensity2
Intensity1 = Challenge1 + Challenge2
Intensity2 = Challenge1 + Challenge2

4.3.2 Multiple regression analysis 1

$$\hat{Y} = a + b_1X_1 + b_2X_2$$

*Benefit*1 = *Intensity*1 + *Inensity*2.

The testing of significance of the overall regression equation (*F*-test) is statistically *significant* at $\alpha = 0.01$ level. Thus, the overall null hypothesis is rejected, implying one or more population partial regression coefficients have a value different from 0.

To determine which specific partial regression coefficients are non-zero, *t*-test is employed.

Result shows the value of coefficient of multiple determinations, R_2, is 0.67; indicating the strength of association in the multiple regressions is rather strong (>0.5). The intercept is estimated to be 11.874.

The partial regression coefficient for *intensity1* (X_1) is –0.070 with the corresponding beta coefficient (standardised coefficient) is –0.076. The *t*-test indicates the coefficient is statistically *insignificant* at α = 0.10 level. The partial coefficient for *Intensity2* (X_2) is 2.614, with a beta coefficient of 0.868. The *t*-test indicates that the coefficient is statistically *significant* at α = 0.01 level. Independent variable *Intensity1* is discarded from this multiple regression model.

The estimated regression equation is written as ($\hat{y}$) = 11.87 + 2.61X_2; or

Benefit1 = 11.87 + 2.61(Intensity2)

Tables 5–7 summarise the results of the analysis for this multiple regression model:

Table 5 Model summary

Model	*R*	*R Square*	*Adjusted R Square*	*Std. Error of the Estimate*	*Durbin-Watson*
1	.818[a]	.669	.630	6.47327	1.939

Notes: [a] Predictors: (Constant), Intensity2, Intensity1; [b] Dependent Variable: benefit1.

Table 6 Anova[b]

Model		*Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*
1	Regression	1438.645	2	719.322	17.166	.000[a]
	Residual	712.355	17	41.903		
	Total	2151.000	19			

Notes: [a] Predictors: (Constant), Intensity2, Intensity1; [b] Dependent Variable: benefit1.

Tables7 Coefficients[a]

Model		*Unstandardised Coefficients*		*Standardised Coefficients*	*t*	*Sig.*	*Collinearity Statistics*	
		B	*Std. Error*	*Beta*			*Tolerance*	*VIF*
1	(Constant)	11.874	4.772		2.488	.024		
	Intensity1	–.070	.176	–.076	–.399	.695	.536	1.865
	Intensity2	2.614	.574	.868	4.552	.000	.536	1.865

Note: [a] Dependent Variable: benefit1.

4.3.3 Multiple regression analysis 2

$\hat{Y} = a + b_1X_1 + b_2X_2$

Benefit2 = Inensity1 + Intensity2

The testing of significance of the overall regression equation (*F*-test) is statistically *significant* at α = 0.01 level. Thus, the overall null hypothesis is rejected, implying one or more population partial regression coefficients have a value different from 0.
To determine which specific partial regression coefficients are non-zero, *t*-test is employed.

Result shows the value of coefficient of multiple determination, R_2, is 0.616; indicating the strength of association in the multiple regression is rather strong (>0.5). The intercept is estimated to be 4.510.

The partial regression coefficient for *Intensity1* (X_1) is 0.226 with the corresponding beta coefficient (standardised coefficient) is 0.862. The *t*-test indicates the coefficient is statistically *significant* at α = 0.01 level.

The partial coefficient for *Intensity2* (X_2) is –0.103, with a beta coefficient of –0.120. The *t*-test indicates that the coefficient is statistically *insignificant* at α = 0.10 level.

Independent variable *Intensity2* is discarded from this multiple regression model.

The estimated regression equation is written as (ŷ) = 4.510 + 0.226X_1; or

Benefit2 = 4.510 + 0.226(Intensity1)

Tables 8–10 summarise the results of the analysis for this multiple regression model:

Table 8 Model summary[b]

Model	*R*	*R Square*	*Adjusted R Square*	*Std. Error of the Estimate*	*Durbin-Watson*
1	.785[a]	.616	.571	1.97692	1.901

Notes: [a] Predictors: (Constant), Intensity2, Intensity1; [b] Dependent Variable: benefit1.

Table 9 ANOVA[b]

Model		*Sum of Squares*	*df*	*Mean Square*	*F*	Sig.
1	Regression	106.510	2	53.255	13.626	.000[a]
	Residual	66.440	17	3.908		
	Total	172.950	19			

Notes: [a]Predictors: (Constant), Intensity2, Intensity1; b Dependent Variable: benefit1.

Table 10 Coefficients[a]

Model		*Unstandardised Coefficients*		*Standardised Coefficients*	*t*	*Sig.*	*Collinearity Statistics*	
		B	*Std. Error*	*Beta*			*Tolerance*	*VIF*
1	(Constant)	4.510	1.457		3.095	.007		
	Intensity1	.226	.054	.862	4.198	.001	.536	1.865
	Intensity2	–.103	.175	–.120	–.587	.565	.536	1.865

Note: [a] Dependent Variable: benefit1.

4.3.4 Multiple regression analysis 3

$\hat{Y} = a + b_1X_1 + b_2X_2$

Intensity1 = Challenge1 + Challenge2

The testing of significance of the overall regression equation (*F*-test) is statistically *insignificant* at α = 0.10 level. Thus the overall null hypothesis is maintained, implying no one or more population partial regression coefficients have a value different from 0.

Further analysis of the results indicates that the value of coefficient of multiple determination, R_2, is 0.096; indicating the strength of association in the multiple regression is very weak (very close to zero). This is in tandem with the insignificant overall regression equation provided by the *F*-test. The intercept is estimated to be 4.510.

T-test results on the two specific partial regression coefficients indicate that they are non-zero, i.e. Challenge1 (X_1) is 0.668; Challenge2 (X_2) is –1.000, nonetheless they are both statistically insignificant at α = 0.10 level.

Hence, the proposed multiple regression model, *Intensity1 = a +* b_1*(Challenge1) +* b_2*(Challenge2)*, cannot be empirically established.

Tables 11–13 summarise the results of the analysis for this multiple regression model:

Table 11 Model summary[b]

Model	*R*	*R Square*	*Adjusted R Square*	*Std. Error of the Estimate*	*Durbin-Watson*
1	.309[a]	.096	–.011	11.55565	1.772

Notes: [a]Predictors: (Constant), Intensity2, Intensity1; b Dependent Variable: benefit1.

Table 12 ANOVA[b]

Model		*Sum of Squares*	*df*	*Mean Square*	*F*	Sig.
1	Regression	239.690	2	119.845	.897	.426[a]
	Residual	2270.060	17	133.533		
	Total	2509.750	19			

Notes: [a] Predictors: (Constant), Intensity2, Intensity1; b Dependent Variable: benefit1.

Table 13 Coefficients[a]

Model		*Unstandardised Coefficients*		*Standardised Coefficients*	*t*	*Sig.*	*Collinearity Statistics*	
		B	*Std. Error*	*Beta*			*Tolerance*	*VIF*
1	(Constant)	37.532	10.475		3.583	.002		
	Challenge1	.668	.612	.296	1.092	.290	.722	1.384
	Challenge2	–1.000	.810	–.335	–1.235	.234	.722	1.384

Note: [a] Dependent Variable: Intensity1.

4.3.5 Multiple regression analysis 4

$\hat{Y} = a + b_1X_1 + b_2X_2$

Intensity2 = Challenge1 + Challenge2

The testing of significance of the overall regression equation (*F*-test) is statistically *insignificant* at α = 0.10 level. Thus the overall null hypothesis is maintained, implying no one or more population partial regression coefficients have a value different from 0. Further analysis of the results indicates that the value of coefficient of multiple determination, R_2, is also 0.096; indicating the strength of association in the multiple regression is very weak (very close to zero). This is in tandem with the insignificant overall regression equation provided by the *F*-test. The intercept is estimated to be 11.547.

T-test results on the two specific partial regression coefficients indicate that they are non-zero, i.e. Challenge1 (X_1) is 0.177; Challenge2 (X_2) is –0.326, nonetheless they are both statistically insignificant at α = 0.10 level.

Hence, the proposed multiple regression model, *Intensity2 = a +* b_1 *(Challenge1) +* b_2*(Challenge2)*, cannot be empirically established.

Tables 14–16 summarise the results of the analysis for this multiple regression model:

Table 14 Model Summary[b]

Model	*R*	*R Square*	*Adjusted R Square*	*Std. Error of the Estimate*	*Durbin-Watson*
1	.310[a]	.096	.–.010	. 3.54978	2.581

Notes: [a] Predictors: (Constant), challenge2, challenge1; [b] Dependent Variable: Intensity2.

Table 15 ANOVA[b]

Model		*Sum of Squares*	*df*	*Mean Square*	*F*	Sig.
1	Regression	22.734	2	11.367	.902	.424[a]
	Residual	214.216	17	12.601		
	Total	236.950	19			

Notes**:** [a] Predictors: (Constant), challenge2, challenge1; [b] Dependent Variable: Intensity2.

Table 16 Coefficients[a]

Model		*Unstandardised Coefficients*		*Standardised Coefficients*	*t*	*Sig.*	*Collinearity Statistics*	
		B	*Std. Error*	*Beta*			*Tolerance*	*VIF*
1	(Constant)	11.547	3.218		3.588	.002		
	Challenge1	.177	.188	.255	.941	.360	..722	1.384
	Challenge2	–.326	.249	–.356	–1.310	.208	.722	1.384

Note: [a] Dependent Variable: Intensity2.

5 Conclusion

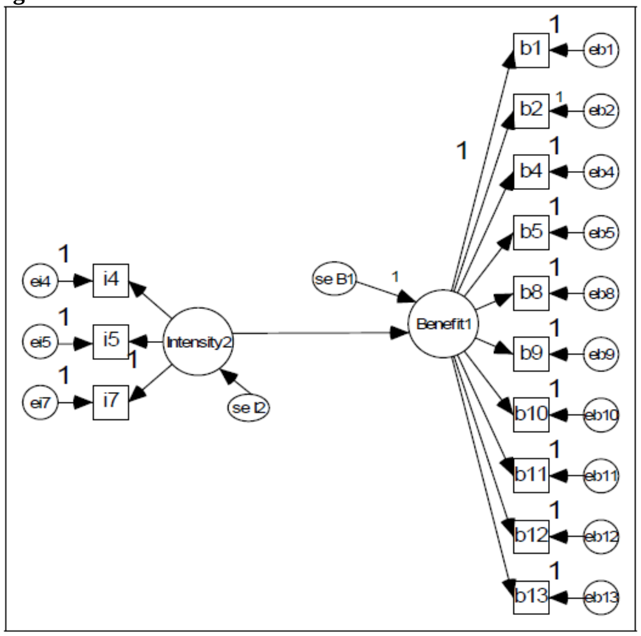
Based on the multiple regression analyses, only the following regression models are statistically significant:

Benefit1 = 11.87 + 2.61(Intensity2) Model 1

Benefit2 = 4.510 + 0.226(Intensity1) Model 2

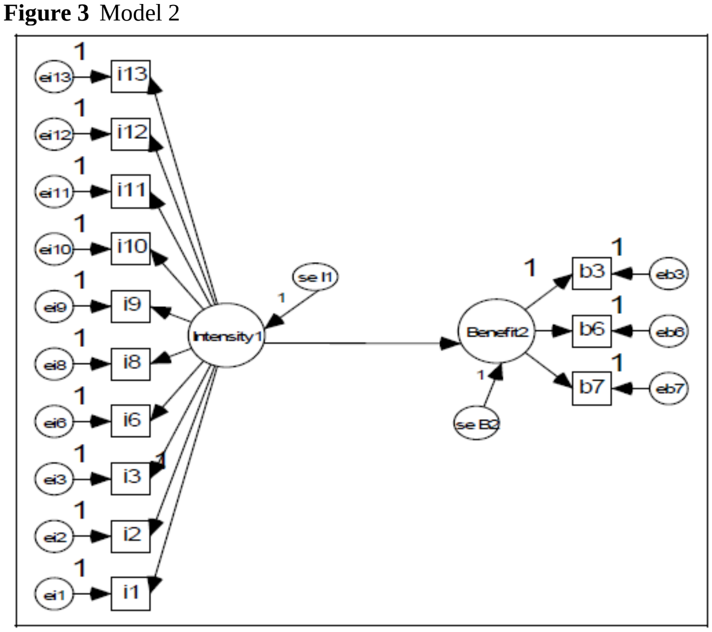
Hence, the corresponding path diagrams for Models 1 and 2 can be drawn as depicted in Figures 2 and 3.

Figure 2 Model 1



Specifically, Figure 2 (Model 1) implies that ERM implementation through initiatives like (a) aligning ERM initiatives to business objectives, (b) integrating ERM across all functions and business units, and (c) enabling the tracking costs of compliance will deliver benefits such as (i) enhancing enterprise's ability to take appropriate risks in value creation, (ii) strengthening management's confidence in business operations, (iii) improving the monitor of enterprise performance, (iv) enriching corporate reputation, (v) improving communicating to stakeholders/shareholders, (vi) enhancing managers' ability to think entrepreneurially and innovatively, (vii) receiving reward by the equity market, (viii) attaining positive impact on enterprise's credit rating, (ix) obtaining respect from within the industry and (x) minimising the cost of agency problem.

Figure 3 Model 2



On the other hand, Figure 3 (Model 2) suggests that implementing ERM through initiatives such as (a) providing common understanding of the objectives of each ERM initiative, (b) providing common terminology and set of standards of risk management, (c) providing enterprise-wide information about risk, (d) providing the rigor to identify and select risk responses (i.e. risk avoidance, reduction, sharing and acceptance), (e) quantifying risk to the greatest extent possible, (f) integrating risk with corporate strategic planning, (g) enabling everyone to understand his/her accountability, (h) identifying Key Risk Indicators (KRIs), (i) integrating risk with key performance indicators (KPIs), and (j) aligning ERM strategy with corporate strategy will bring about befits in the areas of (i) creating smooth governance procedures, (ii) improving clarity of organisation-wide decision-making and chain of command and (iii) facilitating the effort of reporting to regulators.

In conclusion of the above two models we can summarise that the level of ERM penetration in Malaysian public sectors are still low and lots of promotion and risk culture awareness should be promoted.

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