Reliability Assessment of Indicators Measuring the Impact of Enterprise Risk Management on Performance of Higher Education Institutions in Sri Lanka

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Abstract: Higher educational institutions are exposed to various types of risks what other entities face naming strategic, operational, financial, compliance, technological and reputational risk owing to terrifying competition, rapid technological advancements and unpredictable environmental tremors. Implementation of enterprise risk management is the best strategic tool to identify, assess and mitigate the overall risks faced by entities. The implementation of enterprise risk management is however hindered by the high cost for ERM systems implementation and the inability of justification of increasing performances. Many research studies conducted by academicians and practitioners to ascertain the significant positive relationship of Enterprise Risk Management implementation and firm performance concluded with contradictory deductions. This study is an investigation of the reliability of the indicators measuring the impact of ERM implementation on the performance of non-state higher education institutions in Sri Lanka. The sample of hundred and seventy senior professionals was selected from the study population of seven hundred and seven senior persons attached to non-state institutions in Sri Lanka using stratified random sampling technique. This paper presents the outcomes of the quantitative investigation conducted to test the reliability of the indicators that were used to measure the latent variables in the survey instrument. As the Cronbach's alpha value of each latent variable was well above the threshold of 0.70, the items used in each variable were fitting to the construct and therefore accepted as reliable indicators to measure the constructs.

Keywords: Organizational ERM Philosophy, Organizational Culture, Organizational Governance Structure, Organizational Hierarchy, Tone-from-the-Top, Employee Involvement

1. Introduction

Due to rapid competition, fastly moving technologies and unpredictable market oscillations in the present dynamic envioronment, entities are confronted with risks regardless the nature or type of their business, origin or the size of the organization. Higher educational institutions (HEIs) too have not been able to escape from these challenges and they also face all the types of risks that faced by other business organizations. HEIs face strategic risk when the set objectives are not achieved and face operational risk when they do not have proper systems and procedures in place in achieving set goals and objectives. Financial risk occurs in HEIs with the inability of protecting the assets they own. HEIs are mostly vulnerable to compliance risk due to unconformity with the set rules and regulations by authorities and especially the partner universities. HEIs are exposed to reputational risk when the general public has negative perceptions of the brand name thus failing to meet the expected enrolments thus profitability. In order to survive in this risky environment, institutions need to properly assess the gravity of the impact of the risky events as proper risk management will only support them for long term sustainability. Therefore, higher education institutes in the present world need to look for various strategies and solutions to overcome these upcoming challenges.

Enterprise Risk Management (ERM) approach has been considered and well accepted by entities worldwide as it provides an integrated solution to entities to safeguard the value of the firm. The risk management process will provide the shield for entities from unexpected losses coming from possible risk types (Karaka & Senol, 2017). According to Beals, Fox and Minsky, the ERM will stimulate the understanding of the top management on the factors affecting the implementation of ERM and improve the decision-making processes while improving the firm value while minimizing the cost of corrections (2015).

ERM is an alternative approach to the Traditional Risk Management (TRM) approach as TRM was a silo approach where diverse risks were identified, assessed and mitigated treating them separately. Entities who realized that the missed chances are bringing unbearable losses to their firms considered a better alternative approach to ERM as ERM is a holistic approach where the overall risk is viewed and treated as a whole in an integrated manner.

Table 1. TRM Vs ERM

Traditional Risk Management (TRM)	Enterprise Risk Management (ERM)
• A “Silo” approach	• An “Holistic” approach
• Considered risk as an individual Peril	• Risk is regarded from the business strategy perspective
• Risk and the impact of risk is assessed seperately	• Development of a portfolio of various risks
• Discrete risks are much focused	• Critical risk are only focused
• Risk mitigation is the major concern	• Optimization of the risk for creating value to the business is the major concern
• Establishment of risk limits	• Formation of the Risk strategy

(Source: Adapted from Sithipolvanichgul, 2016)

ERM approach though has become popular over TRM approach as a better strategic solution due to the above characteristics, the implementation of ERM has been hindered by many factors such as less significant evidence to prove that it will increase the performance of entities by ERM implementation and the high cost involves with ERM system implementation. As a result, many research studies have been carried out to find what factors are affecting to the ERM implementation and the significant positive impact of ERM implementation on firm performance by practitioners. These studies have found out that there are various internal, external, human, technological and other factors influencing the implementation of ERM into organizations. Most of the research studies have not been able to prove the significant positive impact of ERM implementation on firm performance (Abeyrathna & Lakshan,2021). This study is a quantitative investigation on the reliability of the indicators that are

used in measuring the latent variables identified from the comprehensive literature review conducted in the study.

2. Literature Review

2.1.1 Non-State Higher Education Institutions in Sri Lanka

The institutions offering degrees, advanced diplomas, diplomas, professional diplomas or certificate courses in any field are recognised as non–state higher education institutions (N-SHEIs) in Sri Lanka (MOHE, 2020). The government of Sri Lanka has not been able to meet the increasing demand for higher education yearly due to about 120 000 students satisfying the minimum qualification for higher education from advanced level examinations. From these, around 12 000 students who can afford drains around US $50 million per annum from the country to pursue their higher studies abroad and a considerable percentage of students seek higher education opportunities locally where the non-state higher education institutions now comprehend in fulfilling this demand (UGC, 2018). As a result, non-state higher education sector is growing and has become popular among the youth in recent years with the incoming of too many new players to the sector shifting the competition.

Table 2. Composition of N-SHEIs in Sri Lanka, 2020

Type of Institution	Number of Institutions	Percentage of Total
• Institutions Partnered with foreign universities/institutions	68	72%
• Institutions registered with Ministry of Higher Education	09	10%
• Professional Institutions	17	18%
Total	94	100%

Table 2 above shows the composition of the N-SHEIs of Sri Lanka where there are 94 actively operating institutions presently but, it counts to 116 total number of registered N-SHEIs in Sri Lanka. Majority of the institutions are partnered with foreign universities, and it is 72% of the total institutions. There are 17 professional institutions, and they also offer diploma, advanced diploma and degree level courses representing 18% of the total stake of the segment. The least percentage of the segment is presented by the institutions registered with the ministry of higher education and it is only 10% from the total institutions. Though, this percentage is small, these nine institutions are holding large number of students offering many undergraduate and postgraduate courses to the students of Sri Lanka (MOHE, 2020).

2.1.2 Challenges for Non-State Higher Education Institutions in Sri Lanka

Non-state higher education institutions that facilitate thousands of students who are eligible for university education but, no entry to the state university system due to space limitation play a major role in the higher education industry of Sri Lanka. Though, there is a quantitative shift in the number of non-state higher education institutions running in the country yet it debatable whether there is a sufficient qualitative shift in terms of the quality of instructions, independent leadership and progressive curricula of these institutions. (Kulasooriya, 2019).

2.2.1. Competition

Competition for attracting students for private universities is rising worldwide due to the reason of few state-funded universities (Anam, 2019). The present situation of the higher education sector of Sri Lanka is immensely competitive with existing and new entrants trying to grab the market share while struggling for survival. As a result, they are now constrained to allocate a high marketing budget for promotional activities and for student recruitments.

2.2.2. Emerging regulatory issues

In Sri Lanka, there is no single, independent accreditation board for regulating, managing and overseeing the functions, standards, quality and recognition of the degrees offered by non-state sector institutions. It is emphasized the establishment of such an independent accreditation board for monitoring standards of non-state higher education institutions of Sri Lanka (Kelegama, 2017).

2.2.3. The perception of the general public

The perception of the general public on the private higher education institutions is not favourable as it is much influenced by social class and political opinions.

2.2.4. Changing behavior of students

Present-day parents and students look for qualifications that will add high employability skills in a shorter period of time. The present trend is the student moving from traditional academic qualifications to vocational and professional qualifications with the expectation that they will add necessary skills to grab a highly paid employment.

2.2.5. High cost of courses

Sri Lanka is a low-income country with less than US$ 10 000 GDP per capita income and a country with the lowest gross enrolment rate for higher education in the region which is below 20% when the average is 23% (The World Bank, 2017). The low per capita income has been one of the reasons for the lower enrolment rate in higher education as 80% of the students enter to job market after O/L and A/L qualifications without the affordability or the interest for higher education. The higher education sector of Sri Lanka is now dominated by foreign-affiliated universities. Although, it is cost-effective to study in Sri Lanka compared to studying abroad still most of our students cannot afford to study in these affiliated institutions due to high tuition fees (Kulasooriya, 2019).

2.2.6. Language barrier of students

Courses in higher education institutions are delivered in English medium especially the programs of foreign universities. This has been a major barrier for Sri Lankan students to proceed to higher education as many of the schools in Sri Lanka teach in Sinhala or Tamil medium. Students are much reluctant to enter to higher education due to the lack of English proficiency required by many institutions.

2.2.7. Outbound Student Mobility

A significant percentage of Sri Lankan students go abroad annually for pursuing higher education. This has shrunk the higher education market for the locally playing institutions.

2.2.8. Faculty

The teaching staff is the key asset of an academic institution and attracting qualified and experienced academics of high standard is a challenge for institutions. Non-state higher education institutions in Sri Lanka mostly rely on visiting or contractual academics on a semester or term basis to annual basis. This has made academics to engage in many institutions as possible to diversify their risk of losing income and as a result the commitment and contribution of teaching staff on non-academic and research-related work is minimal.

Furthermore, the intense rise of number of institutions running has generated a gigantic competition for qualified and skillful academics (Kulasooriya, 2019).

2.2.9. Graduate Unemployment

Graduate unemployment is a famous long-lasting problem in Sri Lanka that has been existing over decades. Though graduates are equipped with subject knowledge, the major complaint of employers is that the graduates are lacking the required soft skills by the private sector.

2.2 International ERM Standards and Frameworks

There are several international standards, frameworks and platforms to select the best model which is appropriate for the capabilities of the firm. The organization can select the most suitable model with the support of the opinions of risk managers, consultants and experts. The better the knowledge and the experience of the evaluators better be the decision the firm makes. (Puntervolt, 2017; Vollmer, 2015; Perera, 2019).

The theoretical literature review of this study revealed seven international standards that institutions may use to select the best suitable model for their institution. 1) COSO ERM – Integrated Framework (2004), 2) COSO ERM Integrating with strategy and performance Framework (2017), 3) Casualty Actuarial Society Framework (CAS, 2003), 4) International Standard for Risk Management (ISO 31000, 2009), 5) ISO International Standard for Risk Management (31 000: 2018), 6) COBIT 2019 : Framework of the Information Systems Audit and Control Association for customizing and right-sizing enterprise governance of information technology and 7) Standards and Poor's Enterprise Risk

Table 3. ERM Definitions given by International Standards

Model	Definition	Empirical evidence
COSO (2017)	"Enterprise risk management is not a function or department. It is the culture, capabilities, and practices that organizations integrate with strategy-setting and apply when they carry out that strategy, with a purpose of managing risk in creating, preserving, and realizing value. Enterprise risk management is more than a risk listing. It requires more than taking an inventory of all the risks within the organization. It is broader and includes practices that management puts in place to actively manage risk. Enterprise risk management addresses more than internal control. It also addresses other topics such as strategy-setting, governance, communicating with stakeholders, and measuring performance. Its principles apply at all levels of the organization and across all functions. Enterprise risk management is not a checklist. It is a set of principles on which processes can be built or integrated for a particular organization, and it is a system of monitoring, learning, and improving performance. Enterprise risk management can be used by organizations of any size. If an organization has a mission, a strategy, and objectives—and the need to make decisions that fully consider risk—then enterprise risk management can be applied. It can and should be used by all kinds of organizations, from small businesses to community-based social enterprises to government agencies to Fortune 500 companies".	Metricstream (2018) IRM (2018a) IRM (2018b) Wheatley (2018)
COSO (2004)	"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	Alawattegama (2017 & 2018) AGB (2016)

Model	Definition	Empirical evidence
	that may affect the entity, and manage risks to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives."	Barnett (2014) White (2019) Vollmer(2015)
ISO (2018)	"The purpose of risk management is the creation and protection of value. It improves performance, encourages innovation and supports the achievement of objectives. Principles include the requirement for the risk management initiative to be (1) customised; (2) inclusive; (3) structured and comprehensive; (4) integrated; and (5) dynamic. The purpose of the risk management framework is to assist with integrating risk management into all activities and functions. The effectiveness of risk management will depend on integration into governance and all other activities of the organisation, including decision-making. The risk management process involves the systematic application of policies, procedures and practices to the activities of communicating and consulting, establishing the context and assessing, treating, monitoring, reviewing, recording and reporting risk".	IRM (2018b)
ISO (2009)	"…coordinated activities to direct and control an organization with regard to risk" "set of components that provide the foundations and organizational arrangements for designing, implementing, monitor, reviewing and continually improving risk management throughout the organization".	Yazdanpanaha & Saharkiz (2015) Rodrigo et al (2012) Soliman & Muktar (2017)
CAS (2003)	"The discipline by which an organization in any industry assesses, controls, exploits, finances, and monitors risks from all sources for the purpose of increasing the organization's short- and long-term value to its stakeholders."	Seik et al (2011) Acharyya (2009) Gordon et al (2009)
S&P ERM Rating	*"...* is tailored to each insurer's risk profile and focuses on five main areas: risk management culture, risk controls, emerging risk management, risk models, and strategic risk management."	Mc Shane et al (2011) Baxter et al (2013)

Management: analysis into *Corporate Credit*.

(Source: Adapted from Sithipolvanichgul ,2016)

2.2.1 Summary of Emperical Literature Study

The literature review of this study was conducted using electronically published journal articles, dissertations and theses reports under the categories of theoretical and empirical reviews. This section of the paper presents the findings from the empirical literature category on the topic of the impact of ERM implementation on the performance of non-state higher education institutions in Sri Lanka.

Fraser and Simkins as cited by Sithipolvanichgul (2016) state that many studies have been carried out to explore the association between the impact of ERM on organizational performance. According to Mikes and Kaplan, Krause and Lehner, Iyer and Rogers as cited by Sithipolvanichgul (2016), there have been continuous critics that the quality of indicators used to measure the ERM implementation is problematic and thus the conclusions made from studies have been distorted largely.

It is always debatable whether the cost incurred by a firm on ERM is justified by the performance of the firm. This debate has always discouraged small organizations to implement ERM at a high cost. This has been researched by many academics and practitioners what the impact of ERM implementation makes on the value creation for the stakeholders (Alawattegama, 2018; Karaca and Senol, 2017; Li et al, 2015; Rodrigo et al, 2012; Sithipolvanichgul, 2016; Perera et al, 2020).

Many studies have found that there is a positive relationship between ERM implementation and organizational performance but, many of those relationships are not statistically significant (Alawattegama, 2018; Sithipolvanichgul, 2016; Karaca and Senol, 2017; Soliman and Muktar, 2017; Rodrigo et al, 2012; Yazdanpanaha & Saharkiz, 2015; Vollmer, 2015). Findings from previous studies have made a confusion in relation to ERM impact on firm performance. This indicates that further studies need to be carried out to investigate the significant impact of ERM implementation on firm performances (Alawattegama, 2017; Sithipolvanichgul, 2016; Karaca and Senol, 2017; Rodrigo et al, 2012; Yazdanpanaha & Saharkiz, 2015; Vollmer, 2015; Whitfield, 2003; Khan et al; 2016).

Alawattegama conducted a research that explores the impact of ERM on firm performance focusing the banking and finance industry of Sri Lanka in 2017. He selected a sample of 45 banking and finance companies from the population of 53 companies listed in the Colombo Stock Exchange (CSE) using the convenience sampling method. Primary data have been collected using a survey questionnaire distributed among the senior managers and the secondary data were gathered referring the published annual reports of the sampled companies downloaded from the CSE official website. The COSO (2004) ERM integrated framework was used to assess the extent of adoption of ERM practices, and the Return on Equity (ROE) was used to measure the performance of the entity and used the multivariate regression analysis and Pearson's Correlation Coefficient measure to assess the sharpness of association between variables. Alawattegama (2017) found from his study that none of the eight key ERM functions suggested by the COSO (2004) framework has a significant impact on firm performance. Event identifications, risk assessment, risk response and information and communication variables have indicated a positive impact on firm performance, but the relationship were not significant. These findings induce the strategy formulators to re-think on the cost-benefit considerations when planning on implementation of ERM practices to companies in the banking fiancé industry.

Alawattegama carried out another study in 2018 using 17 companies in the diversified segment that are listed in the Colombo Stock Exchange with the objective of exploring as to what extent the adoption of ERM functions impact on the financial performance of these diversified companies. The Return on Equity (ROE) which is a popular proxy to measure the firm performance was used and the eight components suggested by the COSO (2004) framework were used as the independent variables. Both primary and secondary data have been used by Alawattegama in his study. Primary data have been gathered distributing a survey questionnaire with forty questions (five-point Likert scale) among the people who are responsible for the management of risk and who are engaged in strategy development. Secondary data required to measure the dependent variable of Return on Equity (ROE) have been collected using annual audited financial statements that were available on published annual reports downloaded from Colombo Stock Exchange (CSE) web site. ERM supportive internal environment, risk aligned objective setting, event identifications and risk response variables showed positive impacts on the firm performance, and it was found that six ERM functions out of eight in the COSO (2004) framework has no significant implication on performance of the firm.

Table 4. Studies on ERM Implementation and Firm Performance (From 2015 – 2020)

Authors	What was examined, population and the sample	ERM Proxy	Firm Performance Measurement & Analysis Techniques	Findings
Shatnawi et al, (2020)	The factors influencing the enterprise risk management (ERM) practices and firm performance in Jordan and Malaysia. **Context: Malaysia**	"Common factors influencing ERM in Jordan and Malaysia", "Management based factors", Firm- based factors" and " ERM performance based factors"	Non-Financial performance of "Amount of information acknowledgement on ERM in the annual reports of Jordanian and Malaysian firms that are listed in the main Amman Stock Exchange (ASE) of Jordan and the Board of Bursa Malaysia (BBM)"	Malaysia has more robust ERM research works, adoptions, practices, and compliance systems in place compare to Jordan. Malaysia has proved to have more improved and established ERM success factors compare to Jordan. There is a significant relationship between ERM, having CRO, Risk Management Committee (RMC), Audit Committee (AC) and firm performance.
Alawattegama (2018)	The impact of the adoption of enterprise risk management (ERM) practices on firm performance. Population: Sri Lankan Diversified Industry. Sample: **17** diversified, CSE listed companies. **Context: Sri Lanka**		- Return on Equity (ROE) - Multivariate regression analysis	Six out of the eight key functions suggested by COSO (2004) ERM integrated framework has no significant influence on organizational performance.
Alawattegama (2017)	The impact of the adoption of enterprise risk management (ERM) practices on firm performance. Population: Sri Lankan Banking and Finance industry. Sample: **45** Banking and Finance companies registered with Colombo Stock Exchange (CSE). **Context: Sri Lanka**	"Chief risk officer", "Enterprise risk management", "Firm performance", "Firm value", "Internal controls", "Return on equity", "Risk committee".	- Return on Equity (ROE) - Multivariate regression analysis	None of the eight key functions suggested by COSO (2004) ERM integrated framework has a significant impact on firm performance. These findings induce the corporate managers for cost-benefit comparison when implementing ERM practices for their entities.

Authors	What was examined, population and the sample	ERM Proxy	Firm Performance Measurement & Analysis Techniques	Findings
Karaca & Senol (2017)	The effect of ERM on firm's financial performance and the determinants of ERM. Population: Top 200 Firms listed in the Stock Exchange Istanbul, (BIST) Turkey. Sample: **33** firms selected from BIST. **Context: Turkey**	"Risk management", "Financial performance", "Panel Data analysis", "Panel Logistics regression".		The effect of ERM on firm performance were not determined, whereas in the panel logistic regression, firm size was found to be determinant of ERM applications.
Sithipolvanichgul (2016)	Answers for the two questions of 1) Does ERM implementation have an impact on firm performance? 2) Which is the firm specific characteristics that lead to better ERM implementation level? Population: 518 Listed companies in the Thailand stock Exchange Sample: **116** **Context: Thailand**	"Enterprise risk management", "Firm performance", "Traditional risk management", "Return on equity".	Tobin's Q, Return on Equity (ROE) and Return on Assets (ROA) Cluster analysis, Principle Component analysis and Partial Least Squares	The proposed method well compared to the alternatives, both statistically and in prediction performance. The implementing ERM could improve firm performance.

3. Research Methodology

This study was conducted focusing the non-state higher education institutions in Sri Lanka. The major study was to test the identified statistical relationships from the comprehensive theoretical and empirical literature review. This study was conducted prior to the main data collection to confirm the identified latent constructs are reliably measured from the indicators that are intended to measure them. This study could be also named as 'feasibility study' that perform as a pre-testing of the survey instrument including questionnaire (Sekaran, 2003). This quantitative assessment helps the researcher to detect the possible flaws in measurement procedures and in the operationalization of the variables, to identify unclear or ambiguous items in the questionnaire and to reveal information related to embracement or discomfort respondents may experience concerning the content or the wordings of the questionnaire in the early stage (Bone & Kachroo, 2021). This study will also give advance warning where the main research study may fail and will indicate where research protocols might not be followed. Furthermore, it may identify possible practical problems of the research procedure while indicating whether proposed methods or instruments are inappropriate or too complicated. This study is therefore, critical for a research study for testing the feasibility of research instruments like questionnaires or interviewing schedules or the entire research process itself. The assessment of

relianbility of the measuring instrument of the main study was carried out using a sample of 32 respondents to represent the population of 705 senior managers employed by 94 N-SHEIs in Sri Lanka.

3.1 The Conceptual framework

The identified variables and their relationships from the theoretical and empirical literature review are depicted in the conceptual framework of the study and shown in Fig. 1 below.

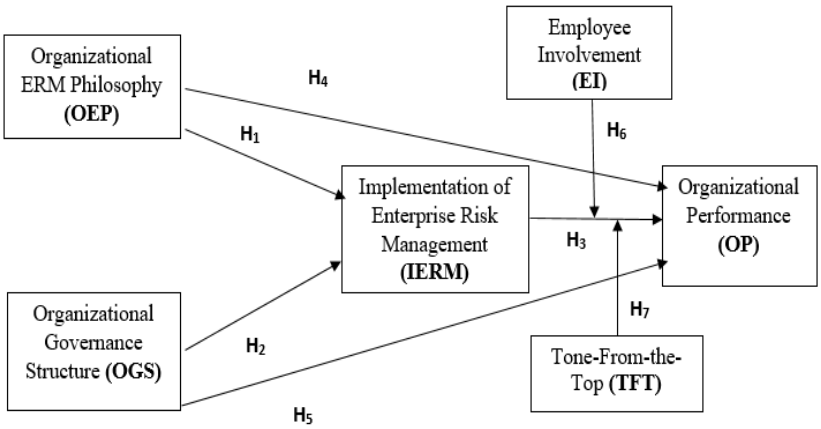

Fig. 1 Conceptual Framework of the Study

3.2 Variables and Hypotheses Development

Table 5 below shows the six variables identified from the critical literature review with the evidence. The two identified factors that positively impact the implementation of ERM are the organizational ERM philosophy (OEP) and the organizational governance structure (OGS) that are used as exogenous variables in the conceptual framework. The implementation of ERM (IERM) plays the role of the mediator of the model making the novelty of this study as in many other studies it played the role of independent or the dependent variable. This study tests the mediating impact of the ERM implementation in between the two factors of OEP, OGS and organizational performance (OP). The tone from the top (TFT) and the employee involvement (EI) are two moderating variables that are affecting the relationship between the IERM and the organizational performance (OP). The organizational performance is the endogenous variable of the conceptual framework which is affected by the three exogenous variables of OEP, OGS and the IERM. According to the study of Mohamed and Yusoff (2021), organizational performance is highly critical for every manager and organizational resources such as human, organization structure, organizational strategy, work process and technology should be managed efficiently. The performance of N-SHEIs in Sri Lanka is measured using the scale which is developed based on the "Key Performance Indicators (KPI) for higher education institutions" recommended by Ballard (2013).

Table 5. Summary of Variables

Variable	Empirical Literature Evidence
Organizational ERM Philosophy (OEP)	(Barac, 2015; Puntervolt, 2017; COSO, 2017)
Organizational Governance Structure (OGS)	(Barac, 2015; Togok, 2016; Sithipolvanichgul, 2016)

Variable	Empirical Literature Evidence
Implementation of ERM (IERM)	(Sithipolvanichgul, 2016; Karaca and Senol, 2017; Soliman & Muktar, 2017; Alawattegama, 2018)
Tone from the Top (TFT)	Togok, 2016
Employee Involvement (EI)	Togok, 2016
Organizational Performance (OP)	(Shatnawi et al, 2020: Rodrigo et al, 2012; Li et al, 2015; Najjar, 2015; Volmer, 2015; Alawattegama, 2017)

Nine relationships have been discovered from the comprehensive literature review and the following hypothesis were formulated to statistically test the existence of significant relationships among the variables in this study for the context of non-state higher education institutions in Sri Lanka.

- H1: Organizational ERM Philosophy (OEP) has a significant positive impact on the implementation of Enterprise Risk Management (IERM)
- H_2: Organizational Governance Structure (OGS) has a significant positive impact on the Implementation of Enterprise Risk Management (IERM)
- H_3: Implementation of Enterprise Risk Management (IERM) has a significant positive impact on the Organizational Performance (OP)
- H_4: Organizational ERM Philosophy (OEP) has a significant positive impact on the Organizational Performance (OP)
- H_5: Organizational Governance Structure (OGS) has a significant positive impact on the Organizational Performance (OP)
- H_6: Employee Involvement (EI) has a significant moderator effect on the relationship between implementation of ERM (IERM) and Organizational Performance (OP)
- H_7: Tone-From-the-Top (TFT) has a significant moderator effect on the relationship between Implementation of ERM (IERM) and Organizational Performance (OP)
- H8: Implementation of ERM (IERM) mediates the relationship between Organizational ERM Philosophy (OEP) and Organizational Performance (OP)
- H_9: Implementation of ERM (IERM) mediates the relationship between Organizational Governance Structure (OGS) and Organizational Performance (OP)

3.3 Operationalization of variables and the instrument development

The conceptual framework of this study has two exogenous, one mediator, two moderators and one endogenous variable and these are operationalized into reliable research instruments. These instruments are to measure the concepts that they intend to measure were developed based on the findings from theoretical literature review especially based on COSO 2004 model and ISO 31 000 standard.

The Table 6 below shows the variables in the conceptual framework and the indicators that are used to measure them. These indicators are all quantitatively assessed using 5-point Likert scale based on the responses of the senior managers in N-SHEIs in Sri Lanka. The organizational ERM philosophy is unidimensional, latent variable which is the first exogenous variable of the conceptual framework, and it is measured from eleven indicators. Organizational governance structure is the second exogenous variable of the conceptual framework which is a tridimensional latent variable where systems and procedures, organizational hierarchy and organizational culture are the three dimensions. Implementation of ERM is the mediating variable of the conceptual framework which is another latent variable and measured using eleven indicators. Organizational performance, a unidimensional latent variable is the endogenous variable of the conceptual framework, and it is measured from eighteen indicators. Employee involvement and tone from the top are the two moderating variables of the model which is hypothesized that the positive relationship between the ERM implementation and the

organizational performance is moderated by them. Employee involvement is a latent variable that is measured using five indicators and tone from the top latent variable is measured by three indicators.

Table 6. Latent Variables and their Indicators

Variable		**Indicators**
Organizational ERM Philosophy (OEP)	OEP1	Risk Attitude: My organization is a risk-taking institution
	OEP2	Risk Appetite: My organization is well prepared to undertake risk
	OEP3	Risk Awareness: The senior management has a complete awareness of the consequences of unmanaged risks
	OEP4	Implementation of ERM: My organization has implemented an effective Institution-wide Risk Management system
	OEP5	Employee Involvement: Employees are involved in the designing and implementing process of ERM system
	OEP6	Tone from the Top: Senior managers and the board members are involved in the designing and the implementation of ERM system
	OEP7	Risk Culture: All the employees are fully educated on types of risks the organization is vulnerable to face
	OEP8	Risk Identification: My organization has a clear system/process to identify the currently unknown but, emerging risks
	OEP9	Risk Assessment: My organization uses an effective enterprise –wide risk assessment matrices to constantly assess the possible risks
	OEP10	Risk Integration with strategic planning: Enterprise –wide risk considerations are incorporated into the firm's strategic decision-making process
	OEP11	Assessment of ERM Effectiveness: My organization regularly reviews the effectiveness of firm's ERM processes and monitor ERM best practices emerging in the market
Systems and Procedures (SAP)	SAP1	My organisation establishes systems and procedures to show how employees can make suggestions for organizational changes
	SAP2	My organisation establishes systems and procedures to reflect the experience learned from the past.
	SAP3	My organisation establishes systems and procedures to guide employees to implement improvement at work.
	SAP4	My organisation establishes systems and procedures to encourage employees to be creative in dealing with problems at work
	SAP5	The employees in my organisation can share opinions with their superior and get involved in making decisions
	SAP6	It is easy to work and making decisions due to the proper systems and procedures in place.
	SAP7	All kinds of business information properly flow electronically across the organisation.
	SAP8	The systems for financial and accounting information, human resource information, supply chain information, where applicable, is fully integrated.
Organizational Hierarchy (OH)	OH1	There are only a few layers in my organisational hierarchy.

Variable		Indicators
	OH2	My organisation is a lean organisation.
	OH3	My organisation has only few management layers between staff at the basic level and the CEO.
	OH4	My organisation establishes proper Job Descriptions to employees with clear job roles in each layer of the hierarchy
	OH5	It is easy to make decisions due to clear organizational structure in place.
Organizational Culture (OC)	OC1	The employees in my organisation have the authority to correct problems when they occur.
	OC2	The employees in my organisation are empowered and have control over their job.
	OC3	My superiors are supportive of the decisions made by their team.
	OC4	The existing organizational culture supports decision makers with minimum restriction
	OC5	The positive behaviour of employees has minimized the conflicts among the employees
Implementation of ERM (IERM)	IERM1	My organization identify, assess, and control strategic, financial, operational, and compliance risks; ERM is an integral part of the (strategic) planning & control cycle.
	IERM 2	My organization identify, assess, and control strategic, financial, operational, and compliance risks; we are in the process of implementing a complete ERM system.
	IERM 3	My organization identify, assess and control risk in specific area; we are planning to implement a complete ERM system.
	IERM 4	My organization actively controls risk in specific areas (e.g. health & safety, financial risk); we are considering to implement a complete ERM system
	IERM 5	Risk management is mainly incident-driven; no plans exist to implement ERM
	IERM 6	My organization seamlessly integrates all business modules in the Enterprise Risk Management system.
	IERM 7	My organization seamlessly integrates all internal business transactions in the Enterprise Risk Management system.
	IERM 8	My organization seamlessly integrates the Enterprise Risk Management system with customer and supplier systems, using communication protocols and standards.
	IERM 9	9 My organization implements risk management software to capture all risk information which includes the risk events, response and status of each response.
	IERM 10	The risk management software used in my organization is accessible to all the applicable risk owners, line management and the dedicated risk team.
	IERM 11	The risk management software used in my organization is integrated with all the other operating systems in the institution.
Organizational Performance (OP)	OP1	My organization has achieved the expected budgetary performances
	OP2	My organization has achieved the targeted revenue performances

Variable		Indicators
	OP3	My organization maintains the service quality what is expected by the stake holders
	OP4	My organization maintains high teaching quality making positive feedback from student surveys.
	OP5	My organization has properly developed systems and procedures in place easing to work with.
	OP6	My organization has poor labor turn over due to satisfied employees
	OP7	My organization has been able to survive in the competition still been profitable.
	OP8	My organization has been able to reach the short term goals set by the shareholders
	OP9	My organization has been able to reach the objectives of the firm
	OP10	My organization has provided students high safety inside the campus premises
	OP11	My organization has produced graduates with high employability
	OP12	My organization maintains high rapport with the alumni.
	OP13	Employees of my organization are highly involved with research and publications
	OP14	My organization encourage and facilitate employees for research and publications.
	OP15	My organization maintains high retention rate of students.
	OP16	Our graduates are highly employable
	OP17	My organization has been able to reach the targeted enrolments
	OP18	Overall, my organization has been able to achieve the expected performances by the shareholders
Employee Involvement (EI)	EI1	Employees are involved in identifying the key risk areas
	EI2	Employees are involved in defining the risk mitigating initiatives
	EI3	Employees put in great efforts to implement the ERM processes/activities
	EI4	Employees are aware of the outcomes the effective use of ERM activities.
	EI5	Employees are trained on the ERM activities.
Tone From the Top (TFT)	TFT1	The internal environment in my organisation provides an appropriate foundation for ERM.
	TFT2	The 'tone from the top' sends an appropriate level of emphasis on the importance of ERM in my organisation.
	TFT3	Board of directors or committee of the board in my organisation is actively involved in the risk management activities.

The survey instrument of this study is a questionnaire that contains 7 sections and 17 main questions with 66 items. The measurement scales of the variables are nominal for demographic information and interval scale for five-point Likert scale variables with strongly disagree and strongly agree as endpoints. Section one of the questionnaire targets to gather the demographic information of respondents while section two aims to recognize the person who is responsible for the overall risk management (ERM Champion) of the institution and his strategic role based on the strategy formulation

process of the institution. Section three aims to collect the views of the respondents on the statements related to the organizational ERM philosophy. This section has 11 items all based on the COSO (2004) model. Organizational governance structure variable is also included in the same section with the three dimensions of systems and procedures, organizational culture and organizational hierarchy. Section four of the questionnaire aims to collect the insights of the respondents on the ERM implementation into their institutions and has 11 items. Section five contains 2 main questions targeting the opinions of respondents on the two constructs of employee involvement and tone from the top. Section six focuses on the insights of respondents on measuring the performances of organizations based on the 5-point Likert scale. This scale has 18 items that have been developed using the Ballard (2013) recommendations on key measures to assess the performances of higher educational institutions. The final section of this questionnaire is reserved for the comments and feedback of the respondents.

3.4 Population and the Sample size

The study population of this study is the senior managers working in 94 actively operating N-SHEIs in Sri Lanka and the content analysis was carried out scrutinizing the information available on websites and other published sources of these institutions. As a result of the content analysis, it was found that there are around 707 persons in the study population. Based on this population size, the sample size was determined according to the table prepared by Krejcie and Morgan in 1970, as 170 (Sekaran, 2003). The sample size for a pilot study should be in the range of 30 – 500 and in multivariate research like this should be as large as the number of variables in the structural model. The sample of 32 respondents was selected using stratified random sampling technique for the pilot study as the conceptual framework of this study has only two exogenous and one endogenous variable.

Table 7. The Population Size and the Sample Size

Institution Category	No of persons in Senior Management (N)	Stratified Sample proportions	Number of subjects in the main sample	Number of subjects in the study sample
• Professional Institutes	128	18%	30	6
• Institutes Registered with MOHE	68	10%	20	3
• Affiliated with Foreign Universities/Institutions	511	72%	120	23
Total	707	100%	170	32

Before the questionnaire was distributed among the target sample of 170 senior managers in N-SHEIs in Sri Lanka, the validity of the instrument was tested using the content validity, criterion validity and construct validity methods. The trust worthiness or the reliability of the questionnaire was tested using the Cronbach's Alpha (α) value. The responses obtained from the pre-test were used to modify the items that were not necessary to be included in the questionnaire. The reliability analysis of the survey instrument was conducted using the pilot-test results of 32 surveys using Statistical Package of Social Science (SPSS). 32 respondents were selected from all three strata of the institution categories following the same proportionate of the population for the compatibility of the pilot study results with the main study results. The pilot study contains six senior managers from the professional institutions, and it is 18% of the sample size, three from the institutions registered with the ministry of higher education and it 10% of the sample size and twenty-three respondents from the institutions affiliated with foreign universities as it is the dominating strata of the population with 72% of the sample size.

4. Data Analysis

Table 8 shows the demographic profile of the 32 respondents in this study. The majority of the respondents are male senior managers, and it is 62.5% of the sample where only 37.5% of the sample

are female senior managers. The uppermost percentage of the respondents are in the age group of 45-55 making it is about 44% of the sample. Nearly 31% of the respondents are senior managers above 55 years of age and about 19% are below 35 years of age. 69% of the respondents in the sample holds Masters or above qualifications is a distinct characteristic of this study and 19% of them holds professional qualifications. The balance 12.5% of the senior managers hold Bachelor's qualifications. When 31% of the respondents have 2-5 years of experience in the institution another 31% of them have 5-10 years of experience. However, 25% of the respondents have worked more than 20 years in their present employers and only 6% of the respondents in the pilot study has worked less than 2 years in their presently attached employer. The position that the respondent is holding in the presently attached institution is also reported in the table below. The maximum percentage of 12. % of the respondents are holding the positions of Compliance manager, Dean or Associate Dean or Senior manager and the other positions are equally held with the percentage of 6.3% each.

Table 8. Demographics of respondents in the pilot study (n = 32)

Demographic Characteristic	Categories	Frequency	Percent
Gender	Male	**20**	62.5
	Female	12	37.5
Age	Below 35 years	6	18.8
	Between 35 - 45 years	2	6.3
	Between 45 - 55 years	14	43.8
	Above 55 years	10	31.3
Education Level	Bachelors	4	12.5
	Masters or above	22	68.8
	Professional	6	18.8
Length of Experience	Less than 2 years	2	6.3
	Between 2 - 5 years	10	31.3
	Between 5 - 10 years	10	31.3
	Between 10 - 20 years	2	6.3
	More than 20 years	8	25.0
Position held	Academic Board Member	2	6.3
	Board Member	2	6.3
	Compliance Manager	4	12.5
	COO/CEO	2	6.3
	Dean/Associate Dean	4	12.5
	Director	2	6.3
	Head of Department	2	6.3
	HR Manager	2	6.3
	Manager Marketing	2	6.3
	Operations Manager	2	6.3
	Senior Compliance Officer	2	6.3
	Senior Deputy Principal	2	6.3
	Senior Manager	4	12.5

The reliability analysis of the survey instrument was conducted using the pilot-test results of 32 surveys using Statistical Package for Social Science (SPSS). There are six latent variables and the Cronbach's alpha value of each construct was calculated to test whether the items in the scale are sufficiently fitting to the indicator to measure the latent variable which was measured using 5 point Likert scale. The summary of the variables, number of items in each scale, resultant Cronbach's alpha value and the conclusions made are given in the Table 9 below.

Table 9. Results of the reliability analysis of the study (n = 32)

Variable	No of Items	Cronbach's Alpha	Conclusion
Organizational ERM Philosophy (OEP)	11	0.911	*A reliability analysis was carried out on the construct of "Organizational ERM Philosophy (OEP)" scale which is comprising 11 items. Cronbach's alpha showed that the questionnaire has reached the acceptable reliability, α= 0.911. All items appeared to be worthy retention, resulting the removal of none of these items.*
Organizational Governance Structure (OGS)	18	0.842	*A reliability analysis was carried out on the construct of "Organizational Governance Structure (OGS)" scale which is comprising 18 items. Cronbach's alpha showed that the questionnaire has reached the acceptable reliability, α= 0.842. All the items appeared to be worthy retention, which showed similar Means. But, item 11.2.1* and item 11.2.3* are reverse coded and they show negative weak Correlations with the other items in the inter-item correlation matrix, resulting the removal of these items may be considered. Also, it has a negative Corrected-Item Total Correlation value and a small value respectively.* *Most of the items showed a decrease in the alpha if deleted, the two exceptions to this were item 11.2.1* and Item 11.2.3* which would increase the alpha if deleted. As such, removal of these two items may be considered.*
Implementation of ERM (IERM)	11	0.817	*R reliability analysis was carried out on the construct of "Implementation of ERM (IERM)" scale which is comprising 11 items. Cronbach's alpha showed that the questionnaire has reached the acceptable reliability, α= 0.817. All the items appeared to be worthy retention, which showed similar Means. But, item 12.5* shows negative weak Correlations with the other items in the inter-item correlation matrix, resulting the removal of this items may be considered. Also, it has a small Corrected-Item Total Correlation value.* *Most of the items showed a decrease in the alpha if deleted, the one exception to this was item 12.5* which would increase the alpha if deleted. As such, removal of this item may be considered.*

Variable	No of Items	Cronbach's Alpha	Conclusion
Tone from the Top (TFT)	3	0.759	*A reliability analysis was carried out on the construct of "Tone-From-Top(TFT)" scale which is comprising 03 items. Cronbach's alpha showed that the questionnaire has reached the acceptable reliability, α= 0.759. All items appeared to be worthy retention, resulting the removal of none of these items.*
Employee Involvement (EI)	5	0.909	*A reliability analysis was carried out on the construct of "Employee Involvement(EI)" scale which is comprising 05 items. Cronbach's alpha showed that the questionnaire has reached the acceptable reliability, α= 0.909. All items appeared to be worthy retention, resulting the removal of none of these items.*
Scale 06 - Organizational Performance (OP)	18	0.911	*A reliability analysis was carried out on the construct of "Organizational Performance (OP)" scale which is comprising 18 items. Cronbach's alpha showed that the questionnaire has reached the acceptable reliability, α= 0.911. All items appeared to be worthy retention, resulting the removal of none of these items.*

5. Discussion

The findings of this investigation that was performed to test the reliability of the measuring instruments before they were applied for measuring the latent constructs in the main study. The demographic characteristics of the respondents such as gender, age, education level, length of experience in the current employment and the position presently holding were explained using the frequencies and percentages. The reliability of the questionnaire was tested using the Cronbach's Alpha value and it was found that the questionnaire is reliable and valid to use for the data analysis. The eleven items in scale 01 which is the measure of organizational ERM philosophy latent variable are well-fitting to each other with the Cronbach alpha value of 0.911 which is greater than 0.70. It shows that none of the items should be removed from the scale to improve the alpha. Scale 2 which measures the organizational governance structure also shows an alpha value greater than the threshold of 0.70 with similar means indicating that eighteen items in the scale are reliably fitting to each other where there is no need for deleting any items to improve the Cronbach's alpha value from its original value of 0.842 as it is well above 0.70 thresholds. Scale 3 is the measure of mediating variable of implementation of ERM that contains eleven items also shows a Cronbach's alpha value of 0.817 which is greater than 0.70. This indicates that all the items in the scale are worthy of retention and have reached acceptable reliability and there is no need for deleting items from scale 3 to improve the alpha value. Scale 4 is the measure for the moderator variable of tone from the top which is a latent variable containing three items. The Cronbach's alpha value of this scale is 0.759, which is slightly higher than the threshold of 0.70 but, shows all equal means. This means that all the items appeared to be worthy of retention resulting the removal of none of the three items. When the scale 5 which measures the employee involvement is concerned, it has five items to measure the latent variable yet shows the alpha value of 0.909 which is well above the threshold 0.70 shows that the scale has reached acceptable reliability and none of the items should be removed. Scale 6 is the measure of the endogenous latent variable which comprises 18 items. This scale also shows an alpha value of 0.911 which is greater than 0.70 indicating that all the items in the construct are worth retaining. The items on scale 6 have equal means among the items resulting that the removal of none of the items.

As per the findings of the reliability analysis of the survey instrument achieved from this study of 32 respondents selected from the senior managers in N-SHEIs in Sri Lanka, it is concluded that the questionnaire which was compiled using two validated questionnaires and empirical literature findings is valid and reliable to apply for the main analysis. The indicators that are used to measure the latent constructs in the conceptual framework are reliable enough to assess the variables they are intended to measure.

6. Conclusion

This paper was presented with the main intention of revealing the findings of the study of the empirical research that was conducted on the topic of the impact of the implementation of enterprise risk management on the performance of N-SHEIs in Sri Lanka. A comprehensive literature review was performed to discover the factors influencing the ERM implementation and the association between ERM implementation and the firm performance with the support of published journal articles, theses and dissertation reports published by scholars, practitioners and especially the institutions who were interested on risk management. Based on the findings from the literature review, the conceptual framework was developed with two exogenous, one mediating, two moderating and one endogenous construct where all are latent variables. Except for one exogenous construct, all the other constructs are unidimensional variables yet with many items to measure them. Nine hypotheses were defined based on the conceptual framework and they were tested using quantitative data that were collected from a sample of hundred and seventy (170) respondents who are the senior managers of non-state higher education institutions in Sri Lanka. Before the main analysis was conducted, the survey instrument was developed and tested for face validity and then tested for reliability using a sample of 32 respondents conducting the pilot study which the results were presented in this paper. The survey instrument was compiled adapting and adopting two previously validated questionnaires from Togok (2016), Sithipolvanichgul (2016) and adding a new scale to measure the dependent variable with the support of empirical and theoretical literature. The reliability of the survey instrument was tested using a reliability analysis tool in SPSS. According to the findings of the pilot study, all the items in the scales were valid and reliable without eliminating items from scales. The pilot study, therefore, concludes that the survey instrument is valid, reliable, and adequate to be applied for the main analysis.

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8. Co-authors' Contributions

The authors were involved in conducting this research, advising in the process of data collection and analyzing, proofreading and reviewing articles under the obligations of research group members.

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