

## Impact Analysis of Factors Associated With the Extent of Monitoring and Reporting of Risk

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**ABSTRACT** The study investigated factors associated with the extent of risk monitoring and reporting. Sixty-four (64) risk analysts of a University as the sample size participated. The study adopted a case study design. The respondents were sampled using a stratified random sampling technique and data analysed using correlation analysis technique. The findings revealed two facts: (1) the University does not have overall reporting processes designated to risk officers, (2) the University does not have formal risk management monitoring and reporting systems-FRMMP. However, the study showed that FRMMP is significant and does impact on the institutional risk management as a predictor ( $p < 0.05$ ), with odds ratio being 0.639, (a value  $< 1$ ). This indicates that the more FRMMP is applied in the institution, the less likely the institution is to report risk.

### INTRODUCTION

The prevailing definition of institutional risk management (IRM) adopted by most institutions is the one proposed by Committee of Sponsoring Organisations of the Treadway Commission-COSO (2004) process. It intended to establish key concepts, principles and techniques. In this framework, IRM is defined as a process. It is effected by an entity's board of directors, management and other personnel. This is to manage risk in order to provide reasonable assurance regarding the achievement of entity's objective. This definition highlights the fact that IRM needs to reach the highest level of the institutional structure and is directly related to the corporations' business strategies.

Despite its wide acceptance, the COSO (2004) definition is not the only available definition. For example, Casualty Actuarial Society-CAS (2003) offered an alternative definition of IRM. In CAS's definition, IRM is the discipline, by which an institution in any industry assesses, controls, exploits, finances, and monitors risks from all sources. The purpose is for increasing the institution's short- and long-term value to its stakeholders. Individual institutions may define IRM uniquely according to their own understanding and objectives. Creating a clear, institution-tailored definition is an important precursor to the institution implementing a successful IRM process.

### Background: Trends and Relevance of Institutional Risk Management

While institutional risk management as a whole appears to be a new concept in South Africa, in a sharp contrast though, a survey of international literature (COSO 2004; Liebenberg and Hoyt 2008; Lam 2006) suggests that of 271 large institutions, ninety-one percent (91%) are building, or planning to build IRM. A little over one-tenth (11 percent) have completely implemented IRM (Advanced IRM). A cross-industry survey of 137 global firms by the Lam (2006) also found that 45 percent have already appointed chief risk officers (CRO) or equivalent, while more than one-fifth (24 percent) planned to appoint a CRO. The above statistics suggest that the level of interest in institutional risk management has never been greater. Additionally, a survey of 1,000 directors indicated that 76 percent want to spend more time on risk management (Lam 2006). Yet, the rating agencies, led by Standard and Poor- S and P (2005), have also established IRM criteria for financial and non-financial institutions that would be applied in their corporate rating processes. In addition, the survey data indicated that 46 percent of Asia-Pacific chief executive officers (CEOs) strongly agree that IRM is a top priority to enhance institutional quality as compared to 28 percent of United States CEOs who strongly agree with that statement.

The above indexes suggest that institutions are implementing IRM processes to increase the

effectiveness of their quality management activities, with the ultimate goal of increasing stakeholder value. In fact, a survey by Liebenberg and Hoyt (2008) of insurance executives worldwide finds that institutional risk management has 'come of age,' with insurers giving 'institutional level risk management increasing attention, high-level accountability, and clear responsibilities.' Liebenberg and Hoyt (2008) examined characteristics of institutions and their IRM adoption status. Companies adopting IRM cited the influence of the risk manager (61 percent), encouragement from the board of directors (51 percent), as the key factors causing their adoption of IRM (Liebenberg and Hoyt 2008). The authors used chief risk officer appointments to examine the determinants of IRM adoption (Liebenberg and Hoyt 2008). The authors found that companies that appoint CRO enhance institutional quality and have higher leverage. In fact, Stoney (2007) found that large firms are more likely to adopt integrated risk management framework processes than smaller firms. In this regard, the researcher examines a research question in relation to the effect of formal risk management monitoring processes (FRMMP) on IRM as well as external auditors (EA).

In addition to the facts regarding the urgent need to enhance quality management processes with risk management, the final and important question is: what is an institutional-wide risk management potential in strategic thinking about quality? This question is important and may tempt critiques. The reason being that in South Africa, the Higher Education Quality Committee-HEQC (2004) has executive responsibility for quality promotion and quality assurance in higher education. In which case, the Higher Education Act of 1997 states that the functions of the HEQC are to: (1) promote quality in higher education, (2) audit the quality assurance mechanisms of higher education institutions, (3) accredit programs of higher education; implying that there is already quality (risk) being managed. But note that an institution can never be too careful in managing its risks, especially in an ever changing environment such as Universities. Thus, the question still remains important. Following the above question, it could be put in two sub-categories. Accordingly, one may be tempted to ask the questions: (1) what is quality management enhancement and (2) what difference does it make in terms of risk management?

It is important to acknowledge that the essence of the contestation here is not to establish a difference as it were, but to enhance quality using risk management techniques. Whether or not there is a difference, it is important to note the urgent need for enhancement of quality by using risk management models. Therefore, to address the above question(s), the researcher explicitly follows Stoney's (2007) argument relating the need for risk management techniques to enhance quality in higher education institutions (HEIs).

Inferring from the above indexes and even the support for risk management to enhance institutional quality, it could be said that none of these scholarly works addressed the issue of IRM in South African University context. In which case, this particular study serves to accomplish the objective of enhancing quality management with risk management procedures. This was done by investigating one of the processes (monitoring and reporting) that could be used in a University context.

Conclusively, to examine all of these areas as a whole, the researcher explored five research questions (cf. research questions) regarding an entity's IRM to enhance QM. As a consequence, this study is therefore an analysis of factors associated with the extent of Monitoring and reporting or risk. It was conducted in a historically black South African University.

## Research Questions

**RQ1:** Is the presence of a designated risk officer (DRO) positively associated with an institutions stage of IRM?

**RQ2:** Is a higher percentage of formal risk management monitoring and reporting processes (FRMMP) positively associated with an institutions stage of IRM?

**RQ3:** Are explicit use of resources to manage risk (RMR) for internal audit positively associated with an institution's stage of IRM?

**RQ4:** Is the presence of early warning indicators (EWI) for all key risks reported to management within regular management information reports positively associated with an institution's stage of IRM?

**RQ5:** Is the presence of external auditors (EA) positively associated with an institution's stage of IRM?

## RESEARCH METHODS

The researcher surveyed risk analyst to obtain data related to IRM. The original survey instrument used was drawn from a larger study that investigated the applicability and relevance of risk management in higher education context. The instrument was pre-tested with five academics and four practitioners and made revisions based on feedback received.

### Sample

Members of the University risk (quality) committee, who are primarily members of executive management team and non-executive management team, had access to and agreed to participate in this survey. An electronic invitation was sent to participants to participate well in advance. A few weeks later the questionnaires were sent. The survey process was controlled by anonymity of the respondents. All data used in the study were obtained from the surveys. The researcher received 64 survey responses, a rate of 70.1 percent. In any case, six observations after the response rate had to be deleted due to incomplete/not applicable data for one or more variables in the regression model (for example, some sections) did not have a specific risk officer; therefore, the question related to the specific risk officer was left blank.

### Multivariate Model

To address the five research questions, the researcher used the following ordinal logistic regression model:  $IRM\ STAGE = f(DRO, FRMMP, RMR, EW, EA)$ . The ordinal dependent variable,  $IRM\ STAGE^1$ , reflects a value ranging from 1 to 5. DRO was a dummy variable which represents whether or not the organisation has a designated risk officer. The percentage of formal risk management monitoring processes was represented by FRMMP variable. The researcher used an interval scale for RMR and EW (cf. research questions) that has a value ranging from 1 = strongly agreed 5 = strongly disagreed reflecting the extent of institutions' calls for internal audit involvement in IRM. The researcher included a dummy variable, EA, reflecting whether the institution has an auditor. LNEA measures the natural log of the institution's most recent audited nature.

## RESULTS

### Descriptive Statistics

This section describes statistics on the variables used in the regression model. There is variation in the stage of IRM operations across entity included in the sample. 50 percent of the entities (n = 32 out of 64) in the sample had neither partially or completely implemented the factor of IRM in terms of monitoring nor reporting, while 35 percent (n = 22) had not made a decision to implement IRM or have no plans to implement monitoring nor reporting of IRM. 15 percent of the entities have appointed a designated risk officer in the form of quality assurance overseer. Suggesting that in terms of this variable, 85 percent are still lagging. Meanwhile, the extent of DRO or calls for internal audit involvement in IRM processes is near the midpoint of the scale. Most of the entities (45 percent) are audited, most importantly, and as a whole, the institution itself has been audited by an external auditor (a big four firm), while 68 percent of the entities are based in commerce and or business academic areas and the rest a stratum comprising of education, science and agriculture.

### Model Fitness and Regression Results

Table 2 headed Pseudo R-square<sup>2</sup> gives information of the usefulness of the model before any relevant interpretation. In this case, using Cox and Snell R Square and the Nagelkerke R values, they provide an indication of the amount of variation in the dependent variable. These are described as pseudo R square. The distribution in Table 1 reveals that the values are 0.265 and 0.286, suggesting that between 26.5 percent and 28.6percent of the variability is explained by this set of variables used in the model.

**Table 1: Pseudo R-Square**

Cox & Snell	0.265
Nagelkerke	0.286
McFadden	0.117

On the other hand though, in Table 3, the Omnibus Tests of Model Coefficients gives an overall indication of how well the model performed. For this set of results, highly significant value ( $p < 0.0005$ ) suggest that the model is far

better than SPSS’s original guess ( $\chi^2=75.02$ ,  $df=5$ ). Thus, both results (cf. Table 1: Pseudo R-square and Table 2 Omnibus Tests of Model Coefficients) suggest a significant model fitness for any reasonable interpretation thereof.

**Table 2: Omnibus tests of model coefficients**

	<i>Chi-square</i>	<i>df</i>	<i>Sig.</i>
Step 1 Step	75.020	5	0.000
Block	75.020	5	0.000
Model	75.020	5	0.000

Supporting the above model fitness, the other useful piece of information in terms of research results is distributed and begins in Table 3 provided in the Exp (B) column. These values are odds ratios (OR) for each of the independent variables. The table reveals that the odds of a section in the institution answering yes, ‘they have taken part in IRM’, is 6.356 times higher for a section that reports having problems with IRM and not implemented all factors equal. FRMMP is also significant and does impact on the institution risk management as a predictor ( $p=0.007$ ). The odds ratio for this variable, however, is 0.639, (a value  $<1$ ). This indicates that the more FRMMP in the institution, the less likely, the institution is to report risk. For extra FRMMP, the odds of FRMMP, reporting risk decreases by a factor of 0.639, *certis paribus*. Additionally, for each of the odds ratios Exp (B) shown in the distribution in 3, there is 95 percent confidence interval (95% CI for Exp (B)) displayed, giving a lower value and an upper. In simple terms, this suggest that this is the range of values that risk analyst can be 95 percent confident encompasses the true value of odds ratio. Furthermore, the CI tells a risk analyst that the confidence interval for the variable FRMMP (FRMMP; OR = 6.356) ranges from 3.58 to 13.57. So, although the risk analyst quotes the calculated OR as 6.356, he/she can be 95 percent confident that the actual value of OR in the population lies

**Table 3: Variables in the equation**

	<i>B</i>	<i>SE</i>	<i>Wald</i>	<i>df</i>	<i>Sig.</i>	<i>Exp(B)</i>	<i>95% CI for EXP(B)</i>	
							<i>Lower bound</i>	<i>Upper bound</i>
DRO	-0.208	1.031	0.123	1	0.731	0.453	0.380	1.600
RMR	-0.004	0.014	0.135	1	0.660	0.994	0.464	1.000
EWI	0.416	0.143	3.442	1	0.035	2.046	1.053	2.908
FRMMP	2.000	0.222	37.311	1	0.000	6.356	3.588	13.588
EA	0.340	0.145	7.366	1	0.007	0.639	0.462	0.703

somewhere between 3.58 and 13.57, quite a wide range of values. The CI in this case does not contain the value one (1), therefore, this suggest that this result is statistically significant at  $p<0.05$ .

Furthermore, the results in Table 4 reveal quite interesting explanations. The positive and significant coefficient for DRO suggests that the presence of a designated risk officer is positively associated with the extent of IRM monitoring and reporting ( $p=0.00$ ). This finding suggests that the presence of a risk champion among the senior management team significantly increases the sections stage of IRM process (monitoring and reporting). Similarly, a more formal risk management monitoring processes for internal audit involvement in IRM also are positively associated with an institutions extent of IRM monitoring and reporting ( $p=0.01$ ). Collectively, these results suggest that a high tendency of quality IRM factors is critical to IRM monitoring and reporting with these factors. More so, institution’s section that is larger and is externally audited is more likely to be further into IRM monitoring and reporting than smaller sections. Similarly, sections in the business and commerce are further into their IRM monitoring and reporting, which is likely due to explicit calls for more effective risk management emerging from business regulators or leaders.

**Table 4: Ordinal logistic results**

<i>Variable</i>	<i>Coefficient</i>	<i>Z stat</i>	<i>p-Value</i>
DRO	1.614	3.73	0.00
RMR	0.021	2.41	0.02
FRMMP	0.413	3.00	0.02
EWI	0.345	1.44	0.00
EA	1.806	2.44	0.00
<sup>3</sup> EE	-2.509	-5.08	0.00

**Sensitivity Tests**

While, the main model included a measure reflecting the DRO level of independence, the

researcher separately considered additional institutional measures: the number of directors, the nature of work for internal audit involvement, and the audit committee. None of these variables is significant. Also, to assess the organisations investment in internal auditing, the researcher added LNEA, the natural log of the internal audit, to the model. LNEA is positive and significant ( $p = 0.02$ ), indicating that sections with larger internal audit investments are farther down the path to full IRM adoption. When LNEE (effective early warning indicators) is added, LNREA is no longer significant ( $P=0.07$ )

**Sub-variables Associated with the University-wide Risk Reporting and Monitoring**

In this category of risk reporting and monitoring, there were five sub-variables as evidenced in Table 5. This was primarily based on the sections which have not yet implemented IRM monitoring and reporting processes in relation to the entire institution. The essence is to give a wider view in terms modal responses to support research questions. The distribution of the table was reported in their modal responses. Although, the above results note the effects of the factors, this distribution in Table 5 revealed that the modal response was in each case disagreed with each sub-variable. The only sub-category which respondents agreed to was external auditors conduct audits as part of stator regulation. Indeed a reference to documentary evidence also supports the view of external auditing taking place.

The concern though was the fact that there were no formal risk management monitoring and reporting arrangements that was put in place for the executive management team/audit committee. But the above results urgently suggest the use of FRMMP based on those sections which

have implemented IRM monitoring and reporting. Another area of concern which interviewees noted was the fact that the university does not apply sufficient resources to risk management and its development (RMR). The other form of analysis carried out was the combined response of the risk reporting and monitoring.

**Composite Associated with the University-wide Risk Monitoring and Reporting**

In response to the above, the research investigated how the University fares with risk monitoring and reporting in general. Referring to Table 6, even though, nearly two-thirds (68.1percent) agreed that the institution does risk reporting and monitoring, a concern number of respondents (20.0 percent) disagreed, while 7.8 percent were not sure of the situation in the institution. Thus, a risk analyst could reason that, since the committee members are mandated to report and monitor risk, it becomes a matter of concern for 20.0 percent of them to disagree.

**Table 6: University-wide risk monitoring and reporting**

		<i>Responses</i>	
		<i>N</i>	<i>Percent (%)</i>
Risk reporting	Disagree	64	20.0%
Monitoring	Unsure	25	7.8%
	Agree	218	68.1%
	Strongly agree	13	4.1%
Total		320	100.0%

With reference to the results above, an analyst may reason that the University undertakes audits to an extent as the indexes (external audit sub-variable) revealed.

**Table 5: Disaggregate of University-wide risk reporting and monitoring**

		<i>Overall reporting processes</i>	<i>Formal risk management monitoring and reporting</i>	<i>The university applies sufficient resources to risk</i>	<i>There are early warning indicators</i>	<i>External auditors</i>
N	Valid	64	64	64	64	64
Mode	2	2	2	2	4	
Percentiles	25	2.00	2.00	2.00	4.00	4.00
	50	4.00	4.00	4.00	4.00	4.00
	75	4.00	4.00	4.00	4.00	4.00

## DISCUSSION

The above index suggested that the practice of risk reporting does occur in the University, but what the indexes do not reveal is sufficient empirical evidence as to how the University undertakes risk monitoring and reporting. To interrogate how the University does this, the research turns to the interview sessions. During the interviews, one respondent noted that there was lack of efficient risk management processes and policies in the University's procedures. This as Lin remarked was: "...there are undefined structures in place, besides, both theoretically and practical implementations are problems, because of lack of clear policies, procedures and resources of University risk management."

Lin noted that the first measure the university undertakes in risk monitoring and reporting is the establishment of the internal audit department that cuts across all aspects of the institution's business (Standard and Poor 2005; Liebenberg and Hoyt 2008). It starts with the core business for example, research, teaching, examination, assessment and it also includes the management and utilisation of assets. The audit committee members report directly to EMT for further corrective measures to be taken if applicable. The other aspect is the various committees which are in place at the university (General Prospectus 2009). These committees are assigned the duty to quality assure the processes within various units. With regards to teaching, there is the central academic planning committee which is responsible for the approval of new programmes offered at the university and it has to make sure that there are correct resources available. It also deals with teaching and learning committee (TLC) whether there are sufficient resources to support students and staff in delivering programme. Further it also includes the financials; this deals with how it affects the institution financially, whether it would drain the institution or not. The responsibility of the committee also extends to addressing issues around human resources as whether the university has the human capacity to teach and support the programmes. There are also other structures that deal with executive committee of senate (senex) that looks at teaching assessment. In most cases, senex looks at the advancing of degrees. More so, interviewees noted the need to monitor physical risk as Standard and Poor (2005)

stress. In this direction, the University in 2008 appointed a practitioner who is a safety, health and environment officer (SHEO) to ensure that the quality of the buildings is safe for conducive occupation and use. Needless to say, compared to Nicholas and Steyn (2008), view as aforementioned (cf. context of study), the above were the measures undertaken by the University in relation to risk monitoring and reporting. It is imperative to note that there were still great strides to be made in the form of University-wide risk management policies and procedures, stressed by a respondent (Lin). Moreover, there were no documentary<sup>4</sup> evidence (both hard evidence and on intranet) readily available in the form of policies and procedures in relation institutional-wide risk management, suggesting that regardless of Lin's explanation of the University's monitoring and reporting, there is still more to be addressed with reference to this concern. This may be challenged and debated as the University has range of policies and procedures posted on its intranet. Apparently though, cross examination of all this policies and procedures revealed that they are all admission and labour relations documents. None relates to any University-wide risk policy and procedure. Thus, in view of the disaggregate data and composite data, the research recommends further investigations because (1) the University does not have overall reporting processes designated to risk officers on risk to make required annual audit, (2) the University does not have formal risk management monitoring and reporting systems, (3) the University does not have sufficient resources in relation to risk management and its development in the University. Contrary to the negative sides though is the fact that the external audits (if conducted) as part of statutory regulation within the University are brought to the authorities of the University.

With reference to the research question two, this research recommends further investigations (1) to address overall reporting processes designated to risk officers on risk to make required annual audit, (2) to address formal risk management monitoring and reporting arrangements, (3) to address sufficient resources to risk management and its development in the University. Although, there are no 'one solution to all', authors (Nicholas 2008; Standard and Poor 2005) assert that if that is an institutions situation, then it suggest that the institution (1) lacks of

clear and measurable Key Performance Indicators (KPIs) (2) needs more effective means of compliance monitoring and testing, (3) would like to possess a more efficient system for generating reliable data for internal and external reporting, (4) the institution's current reporting systems are cumbersome and unreliable, suggesting it must develop new performance measurement processes. In which case, it must create and deploy incident and institutional compliance reporting and monitoring.

The above suggest that risks monitoring and reporting involves measuring operational activities, analysing the resulting metrics, and comparing them to internally established standards and industry benchmarks to assess the effectiveness and efficiency of existing operations. In the above context, Xolani argued that "...measurable performance factors include resource usage, operations problems, capacity, response time, and personnel activity." The process should also review metrics that assess business unit and external customer satisfaction. Xolani's view explained the fact established that diminished system or personnel performance not only affects customer satisfaction, but can also result in noncompliance that could result in regulatory penalties. If economically practicable, the process should automate monitoring and reporting processes. Nicholas and Steyn (2008) explained that there are also after-market reporting tools and vendor-supplied performance analysis tools available for risk systems. Client-server systems are not always equipped with analysis and reporting tools. Often management should decide between purchasing expensive after-market reporting tools to automate the data gathering and reporting or generating the reports manually.

To sum up the discussion, Nicholas and Steyn (2008) explain that each risk that requires monitoring and reporting or a contingency plan to be prepared should be assigned to a member of the University team to monitor. The risk monitor should be responsible to the University-wide risk manager/audit section for monitoring the risk, reporting any change in condition, taking the agreed contingency action (plan) if the risk occurs. Inferring from the Nicholas' (2008) view, monitoring of University-wide risks can be achieved by using the following actions: (1) include risk mitigation tasks in the University schedule (2) define appropriate risk milestones

(3) review risk tasks regularly in University-wide risk management meetings (4) perform inspections on risk status, accordingly, risk monitoring reporting form and essential part of completing a University-wide risk management process.

## CONCLUSION

There are two forms of findings in relation to this study. The first findings of this study was conclusive on three facts: (1) the University does not have overall reporting processes designated to risk officers on risk to make required annual audit, (2) the University does not have formal risk management monitoring and reporting systems, (3) the University does not have sufficient resources in relation to risk management and its development in the University. Contrary to the above three facts was one positive fact that the external audits (if conducted) as part of statutory regulation within the University are brought to the authorities of the University.

In response to the fact that little is known about why some organisations embrace IRM while others do not. This study provides some initial exploratory evidence that highlights institutional characteristics associated with the entity's extent of IRM operation. The results suggest that DRO and FRMMP on IRM is critical to extensive IRM operation, and other sections characteristics, such as EA, RMR and EE also help to explain the extent of IRM operation. The researcher acknowledges limitations in this research approach.

## RECOMMENDATIONS

First, the researcher used survey data obtained from one University risk analysts. To the extent those executives do not have accurate first-hand knowledge about IRM operations within their sections, suggesting limited nature of the results. Thus more Universities should be considered in light of the objectives of the research. Second, due to the limited data, the researcher did not consider interactions among the independent variables in the model. Finally, there may be important organisational characteristics or dimensions of IRM operations that were not reflected in the study. The researcher believes this study provides an initial foundation that can spawn additional research on IRM in South African University. Other researchers

are encouraged to examine such issues as IRM effectiveness, particularly specific ways that IRM protects or enhances shareholder value; ways to measure risks that may be more quantitative in nature; effective methods for measuring correlations and interactions of various risk events in order to have a portfolio view of risks; and incentives and barriers to IRM operations.

### NOTES

1. IRM STAGE = 5, if complete IRM is in place; IRM STAGE = 4, if partial IRM is in place; IRM STAGE = 3, if planning to report IRM; IRM STAGE = 2, if investigating IRM, but no decision made yet; IRM STAGE = 1, if no plans exist to report IRM.12
2. The  $r^2$  is the proportion of the variability in Y (dependent variable) that can be predicted, or explained, from X (independent). It is used as a measure of the association between X and Y. For example, if  $r^2$  is 0.90, then 90% of the variance of Y can be "accounted for" by changes in X through the linear relationship between X and Y.
3. With the exception of Exp sign of EE being negative (-), the Exp sign of the rest are all (+)
4. See for instance From <<http://intranet.ufh/beta.php>> (2009) intranet.ufh/Final Report For UFH\_ April 2009. pdf> It is VERY IMPORTANT to note that these sites together with the documents need special permission to be assessed.

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