

Telecommunication risk cultures: an African head office-subsidary comparison

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Mini- Mini-dissertation submitted in partial fulfilment of the
requirements for the degree
Master of commerce in Applied Risk Management
at the North-West University

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Graduation ceremony: April 2019

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PREFACE

This mini-dissertation is the final deliverable in the Centre for Applied Risk Management (UARM)'s taught master's degree programme. The mini-dissertation was written in article format and consists of three sections: Research project overview, Article, and Reflection.

This mini-dissertation is the student's work. The student was responsible for the final concept, set-up, execution of the research project and writing of the mini-dissertation. The members of the supervisory team contributed in an advisory and technical support capacity on study conception and design, analysis and interpretation of data and critical revision of the manuscript. The mini-dissertation was language edited before submission.

The main study supervisor gave the student permission to submit this mini-dissertation for examination.

ABSTRACT

Organisational scandals or unexpected losses are usually associated with risk governance weaknesses. However, formal risk management frameworks cannot be the only measure for evaluating the effectiveness of risk governance systems. Behavioural factors, such as risk culture, supporting these risk management systems also need to be evaluated. In this study, employee perception of the risk culture of a large telecommunications company's head-office was measured and compared with that of its dispersed African subsidiaries. The UARM Risk Culture Scale (RCS-2018) was used to provide information on two risk-culture-related factors: 1) perceived level of risk integration in decision-making in each market, and 2) perceived comfort with own risk management role. The risk culture perceptions varied between the different employee levels and between head-office and the subsidiaries. An expected result was that management tended to feel more confident about their understanding of their risk-related roles than staff in general. However, unexpectedly, the newer subsidiary companies had a more optimistic view of the perceived level of integration of risk than that of head-office personnel. This could be attributed to the limited response rates for some entities, sample composition, and greater positive response bias in the subsidiary markets. Participants indicated that communication and challenge on risks related to decision-making need to improve to increase the organisation's risk culture. Despite this study's sampling limitations, this work lays the foundation for further study in the company to guide interventions to strengthen or change risk culture. The lessons learned during this study are expected to be useful to academics planning to conduct a survey-based study of risk culture, and for other organisations interested in improving their risk cultures, as this exploratory academic study provides a novel view on the practical implications of measuring risk culture.

ACKNOWLEDGEMENTS

I want to thank:

- Jesus Christ, for giving me the health, strength and direction throughout this journey.
- My wife, Abigail Jeffries, for always being at my side, allowing me the space to balance between home, work, travel and studies and for always supporting me. I will always love you.
- My research supervisor, Professor Hermien Zaaïman, for her guidance during the interesting debates and discussion regarding risk culture, as well as for her excitement and interest when discussing the findings of my results.
- Ms. Hedré Pretorius, for assisting with my statistical analyses and keeping her patience with my ever-changing requests for additional analysis as the study matured.
- My employer, for giving me the support and providing me with the authorisation to conduct the study within the company and its subsidiaries.
- Wilna and Ané-a, who conducted the programme before me and provided the foundation for my study. I would also like especially to thank Ané-a for her support and guidance throughout my first year of this programme. Then there was the rest of the risk management department – everyone was always willing to act as a sounding-board and provided guidance.
- Thank you also to the Kerlick team for all the time they spent teaching us about article writing as well as reviewing and editing my dissertation.
- My colleagues, who persevered on this journey with me – you are now family.
- Lastly, my golf 'buddies'; yes, I know my handicap increased and I messed up our standing four ball due to limited time for golf, but I shall be back and one day I will win at least one of the trophies.

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RESEARCH PROJECT OVERVIEW

Research problem statement and objectives

The telecommunications company selected for this study has a centralised approach to risk management. Risk management policies, processes and frameworks are developed and adopted at head-office level and then distributed to subsidiary entities for implementation. The organisation's executive management and board actively support this approach.

The organisation's risk culture has been assessed in two studies conducted in conjunction with North-West University in 2016 (Harding, 2016; Meiring, 2016). These studies focused on the South African head-office only. Since the 2016 study, buy-in was obtained from executive management to implement programmes in the South African entity to address the identified gaps. This led to my expectation that the risk culture of the South African entity would be more mature than that of the more remote subsidiaries across Africa. The purpose of the study reported here was to conduct a first evaluation of the risk culture in the subsidiary markets and to compare them with the head-office in South Africa.

To do this, I collected and analysed data on two factors that influence risk culture and compared the risk culture between the head-office and its subsidiary markets. Furthermore, I evaluated the perceived risk culture level between management and non-management within entities. The aim of the study was to identify if there were statistically significant differences between these groups. This was expected to provide indications as to which areas could be focused on to improve the risk culture overall.

Expected contribution of this study

There is limited academic literature on the topic of risk culture, and especially in telecommunications companies. Moreover, no literature could be found evaluating the risk culture between an organisation's head-office and its subsidiary companies. This exploratory study therefore provides a foundation for further studies aimed at strengthening organisational risk culture programmes.

Audiences

The findings of the proposed research project are relevant to telecommunication executives as well as executives in other sectors who have an interest in improving their organisation's risk culture. In addition, risk managers could use this study to assist the implementation of risk culture programmes within their own environments. Furthermore, this study contributes to the academic body of knowledge by evaluating risk culture in an area where there is currently limited documented academic literature.

Selected journal

The accredited journal *Foresight* (ISSN 1463-6689)

<http://www.emeraldgrouppublishing.com/products/journals/journals.htm?id=fs>

was selected for submission of this mini-dissertation. The journal's Scopus CiteScore 2017 index is 0.91. It focuses on studies related to the future, including the 'management of uncertainty, complexity and risk'. The declared value of the journal is to influence decisions by individuals, organisations and governments under the philosophy that futurists have to prepare to move beyond the current reach and analysis of organisations and practices, with a long-term perspective on future operations. The articles in this journal therefore provide organisational management teams with greater insights on how their decisions could influence the organisational futures. The readership of this journal includes corporate and strategic planners, government advisors, regulatory executives and academics. The value of publishing in this journal is therefore that its audiences could influence risk culture-related decisions regarding multinational telecommunications companies.

I understand that more research work may have to be done before submission to this journal. For example, strengthening the sampling methods employed in the study, to increase the response rate and to review if the organisation's current risk culture programmes influence the companies' risk behaviour. The article will also have to be reworked according to the journal's specific submission requirements, as the UARM examination template is used in this version of the document.

The article for academic purposes follows next; this includes the introduction, the background forming the foundation for the study, the data collection methods, the analysis of the data, and the summary of the conclusions. I then consider the readiness of this article for publication within the reflection section. The appendices provide a summary of the risk culture survey scale used in the study as well as detailed sample demographic information, plus the breakdown of the results per subsidiary entity.

ARTICLE

Telecommunications risk cultures: an African head-office-subsidiary comparison

Abstract

Organisational scandals or unexpected losses are usually associated with risk governance weaknesses. However, formal risk management frameworks cannot be the only measure for evaluating the effectiveness of risk governance systems. Behavioural factors, such as risk culture, supporting these risk management systems also need to be evaluated. In this study, employee perception of the risk culture of a large telecommunications company's head-office was measured and compared with that of its dispersed African subsidiaries. The UARM Risk Culture Scale (RCS-2018) was used to provide information on two risk-culture-related factors: 1) perceived level of risk integration in decision-making in each market, and 2) perceived comfort with own risk management role. The risk culture perceptions varied between the different employee levels and between head-office and the subsidiaries. An expected result was that management tended to feel more confident about their understanding of their risk-related roles than staff in general. However, unexpectedly, the newer subsidiary companies had a more optimistic view of the perceived level of integration of risk than that of head-office personnel. This could be attributed to the limited response rates for some entities, sample composition, and greater positive response bias in the subsidiary markets. Participants indicated that communication and challenge on risks related to decision-making need to improve to increase the organisation's risk culture. Despite this study's sampling limitations, this work lays the foundation for further study in the company to guide interventions to strengthen or change risk culture. The lessons learned during this study are expected to be useful to academics planning to conduct a survey-based study of risk culture, and for other organisations interested in improving their risk cultures, as this exploratory academic study provides a novel view on the practical implications of measuring risk culture.

Keywords: risk culture, risk management, Africa, head-office, subsidiaries, telecommunications

1. Introduction

Risk culture has acquired prominence within banking and financial institutions due to regulatory pressures (APRA, 2016, 2017; BCBS, 2009; DNB, 2015; EBA, 2016; Palermo, Power, & Ashby, 2017; Power, Ashby, & Palermo, 2013). However, South African organisations in other sectors have also shown interest in implementing programmes to improve and enhance their risk cultures (IRMSA, 2018). As the company in this study is listed on the Johannesburg Stock Exchange, it, together with its external subsidiaries, must comply with the King IV report on Corporate Governance for South Africa (IoDSA, 2016). Principle 11 of the King IV report (IoDSA, 2016) states that governing bodies should oversee the company's risk to support the strategic objectives of the organisation. Furthermore, the King IV report advises companies to provide risk management assurance to their management and board. The combined assurance model, as defined by the King IV report, states that this assurance should allow businesses to make robust internal decisions.

Risk culture improvement programmes need to be based on valid data on the status of an organisation's risk management knowledge levels and management practices. The Chief Risk Officer (CRO) and senior executives in the telecommunications company that participated in this study also support this view. This means that the data should be obtained using defensible and academically valid methods based on the definition of the term risk culture used in the organisation. There is uncertainty about how to define risk culture; and about how risk culture should be measured or managed; moreover, it is possible that organisations are using risk culture as a 'buzzword' rather than as a management tool (IRMSA, 2018). Multiple definitions of the term risk culture used by regulatory bodies and professional associations (APRA, 2017; BCBS, 2009; CEB, 2017, 2018; Dominus, 2015; EBA, 2016; FSB, 2014; Levy, Lamarre, & Twining, 2010; Marks, 2016; O'Donovan, 2014) complicate the assessment and evaluation of risk culture. It is important that risk culture improvement programmes support the decision-making processes of organisations. A decision-focused definition of risk culture was therefore used in this study, as follows: 'The risk culture of an organisational group is manifested by the importance given to considering risk when the group makes decisions. The level of explicit inclusion of risk in decision-making represents the implicit, subjective value afforded to risk by the group.' (Zaaiman, Appendix A).

To assist the company to improve its risk culture across geographically distributed entities, the objectives of this study were to investigate and identify possible differences in the perception of risk culture between the telecommunications company head-office in South Africa and its subsidiary offices in four other African countries. The corresponding research questions were:

- How does the perceived risk culture compare between the head-office and its subsidiaries?
- How do the different levels of employees regard risk culture?
- How comfortable are groups of employees with their own risk roles?

These research questions were addressed by administering the UARM Risk Culture Scale (UARM RCS-2018) to managers and non-managers working for the head-office and subsidiary companies. The aim of the study was to identify if there were statistically significant differences when comparing

these groups. This was expected to provide indications as to which areas the company should be focused on to improve its overall risk culture.

Limited academic literature on risk culture exists outside the financial sector, and no risk-culture-related published articles could be found relating to the telecommunications sector. Based on my experience in conducting this study, this article is expected to provide academics and other risk stakeholders with novel and valuable information on the practical benefits and challenges of measuring the risk culture in an organisation.

2. Background

The selected telecommunications organisation studied in this research project has a workforce of approximately 6500 employees across its mobile communication operations, covering South Africa, Lesotho, Tanzania, Mozambique and the Democratic Republic of Congo (DRC). The company has well-established oversight structures for risk management. The board considers business risk when setting strategy, approving budgets and monitoring progress against the budgets. The organisation's risk methodology is based on the ISO 31000 standard (ISO, 2009) with continuous enhancements to the company's risk policy being made to improve the identification, assessment and monitoring of its overall risk.

The South African company's head-office sets the tone and direction for its subsidiary operations regarding risk management. An enterprise risk management policy is published centrally and owned by the head-office. All subsidiary companies are required to comply with this policy. To support the risk management function in each entity, the executive for business risk within the organisation's head-office ensures that there is continuous communication between entities. This includes quarterly meetings with each operation, physical visits to each country, as well as yearly risk management summit meetings, attended by all responsible enterprise risk managers from each of the entities.

Two risk culture studies were performed in 2016 in the South African head-office operation (Harding, 2016; Meiring, 2016), which assessed various aspects of risk culture. Harding (2016) identified inadequate knowledge of risk management at the lower levels within the organisation as an issue, indicating potential differences in perception of the organisation's risk culture between different levels of management and junior staff members. Furthermore, senior managers showed significantly greater comfort with their understanding of risk and risk management than middle managers (Meiring, 2016). Meiring (2016) further identified that managers in the South African organisation believed that risk accountability and responsibility were priorities for improvement, and the organisation should increase risk-related communication.

The findings of these studies were used to inform risk culture improvement initiatives in the South African operations in 2017/18 by:

- Creating greater board, senior management and middle management awareness of the organisation's approved risk appetite and tolerance levels;

- Strengthening relationships between the risk management function and other organisational functions to facilitate on key decisions within the company taking risk into account;
- Redesigning risk reports to be more focused on the management of risk, thereby providing a mechanism for senior management to take more accountability for risk;
- Creating risk awareness throughout the organisation through easy to understand booklets and videos on risk that emphasise the value and importance of risk management;
- Enterprise risk management training provided to middle managers in the South African operations.

Despite these programmes being recent, these initiatives created the expectation that the South African head-office employees would be better informed on risk management and therefore score higher on the risk culture scale than personnel in the distant subsidiaries.

2.1 Risk culture

Li, Griffin, Yue, and Zhao (2013) suggest that the fundamentals of an organisation's performance and survival are based on the soundness of corporate risk-taking approved by its board. Boards have a fiduciary duty to act in the best interests of the company, including initiating and supporting culture programmes to assist them in achieving their objectives (GIA, 2010). Barney (1986) believes that a strong organisational culture is needed to assist the company to meet its strategic objectives. The term 'organisational culture' refers to a set of values, norms and symbols which defines the way in which the entity conducts its business. These values, norms and symbols determine the organisation's unique corporate behaviours and characteristics (Barney, 1986; Bui, Fang, & Lin, 2018; Ring, Bryce, McKinney, & Webb, 2016). Risk culture is a sub-culture of organisational culture (Ring et al., 2016).

Regulatory bodies usually drive the requirements of risk culture improvement programmes. However, if the entities are implementing programmes only to comply with these regulations, they may not always realise the intended benefits of such programmes. Moreover, telecommunications companies, where risk culture is not specifically regulated, might require a risk culture business case with clearly expected benefits before starting initiatives aimed at formal risk culture improvements.

Organisational risk culture may not effectively support an organisation's long-term sustainability (IRM, 2012). Therefore, companies with inappropriate risk cultures could find themselves performing activities inconsistent with the organisation's risk appetite, policies or procedures. Company failures can usually be linked to weaknesses in risk management and therefore to risk culture as in, for example, the 2008 financial crises (FSB, 2014), and the Steinhoff (Cairns, 2018) and KPMG (Hosken, 2017) scandals. Sheedy, Griffin, and Barbour (2017) make a similar claim by stating that regulators and industries acknowledge the organisational risk environment as a factor to prevent these types of scandals and that undesirable risk behaviour can grow when a company permits or encourages it. On the other hand, organisations with strong risk cultures would encourage their employees to take and manage appropriate risks, as the decisions

should then align with the company's risk appetite. Bozeman and Kingsley (1998) state that the way employees perceive actions within the organisation is important. If people believe that others, and especially their superiors, are taking excessive risks, it could be perceived that such risk taking is legitimate and will not be disapproved of. Top managers therefore play an important role in influencing the perception of appropriate risk taking by staff. Furthermore, Sheedy et al. (2017) avers that risk culture should not only be measured at one level, but in different areas in the company, as not only the top managers come under scrutiny during a scandal, but so does everyone in the business. It is therefore important to measure and manage the perceived risk culture at different employee levels across the company.

2.2 Cultural change

Culture in an organisation cannot change overnight but needs nurturing to achieve the desired results. Hoogervorst, Van der Flier, and Koopman (2004) explain that organisational culture tends to be stable based on the business's cognitive memory and systems. However, a behavioural approach to culture allows for cultural change because the organisation's culture, structure and systems as well as management practices combine to influence employee behaviour. Such a view of culture links to the 'onion' model of culture of Hofstede, Hofstede, and Minkov (2010, p. 8), which consists of symbols, heroes, rituals, and values as cultural layers, with the symbols representing the most superficial layer and the values at the core of culture.

Hoogervorst et al. (2004) state that if the organisation's goals are not embedded within its formal structures and systems, it is likely that the business's objectives might not be met. Although the symbols are the furthest away from the values of the Hofstede et al. (2010) model, Hoogervorst et al. (2004) says that they are equally important when assessing culture. This implies that organisations need to be cautious about prematurely implementing programmes to strengthen their risk culture without having the supporting risk structures and systems in place. If the organisation has a weak level of risk management maturity 'symbols' (e.g. no risk appetite statements, key risk indicators, nor risk frameworks and policy), premature risk culture improvement programmes might not succeed (Kimbrough & Compton, 2009). Consequently, the inverse could also hold. Without a strong risk culture in the organisation, the risk management system may not be adopted and accepted by employees, who may not understand their risk management roles. Sheedy et al. (2017) avers that academic researchers have given the internal risk environment little attention, leaving it up to the risk practitioner/consultant community to drive ideas on the characteristics and assessment of desirable risk environments.

Horst, Sekhukhune, and Nyaba (2015) advise that before attempting to implement a risk culture improvement programme in an organisation, there first needs to be an understanding of what risk culture entails. Risk culture evaluation is required to understand the organisation's current culture. Its strengths and weaknesses should be analysed and only thereafter should the proposed risk culture programmes be designed and attempted. Horst et al. (2015) goes further to suggest that

a project plan should be created which tracks the actions needed. The project plan should develop a sense of risk management ownership among senior executives and the owners of the risk management process.

2.3 Risk culture measurement

Sheedy and Griffin (2017) state that measuring the effectiveness of risk governance cannot rely only on risk management structures and policies, i.e. the 'symbols', but has to include how risk management is implemented in the company. Therefore, if organisations evaluate only their risk management systems and structures, they may not be measuring the effectiveness of their programme. Sheedy and Griffin (2017) go further to state that measuring the effectiveness of risk governance should be based on the company's outcomes, but this can only be evaluated in the long-term, by which time the opportunity for intervention might be past. They propose a different approach by analysing the employees' perception of the effectiveness of risk, using survey instruments. Employing a risk culture scale allows for early identification of risk cultural weaknesses and provides the opportunity for intervention. This approach also allows for evaluating differences in perception among employee groups and can inform the company as to possible improvement areas. A similar approach, using a different risk culture scale, was used within this study. This article forms part of a larger project to validate the UARM Risk Culture Scale (RCS).

3. Method

A quantitative approach was used in this study by using the UARM RCS. This scale is divided into two sections. The first section (9 questions) collects demographic data, and the second (42 items) collects information used to evaluate the perceived risk culture in an organisation. An additional item at the end of the scale provides the means to collect information on how the participants believe the organisation's risk culture may be improved. A summary of the scale is available in Appendix A.

An email was sent from the company's Chief Risk Officer (CRO) to all employees via the head-office internal communications department, to provide staff with the message that the CRO supported the study, thereby adding more weight to the process of obtaining responses. The survey was administrated online by North-West University (NWU) to ensure anonymity of the participants. The web-link to the questionnaire was available for 21 days to enable staff to complete the survey. Follow-up reminders, intended to increase the response rate, were sent to all participants at seven and fourteen days after the initial electronic invitation to participate in the study.

3.1 Population and samples

The survey was sent to all permanent employees within the company, with the aim to provide a valid sample that reflects its population. The response rates are presented in Table 1. However, participation by employees in this study was not mandatory; therefore, the lower than expected participation rates in some of the entities meant that the study findings should be seen as indicative

only and to be investigated further in future studies. Although the survey was completed anonymously, respondents were categorised according to their level within the organisation and the entities they worked for. Managers and non-managers were classified at employment band level defined by the company's human-resources policy. The response rates for managers and non-managers were 20% and 80%, respectively.

Table 1: Population of employees in each entity

	Head-office	Combined subsidiaries	Subsidiary companies			
	South Africa		DRC	Lesotho	Mozambique	Tanzania
Employees per entity	5007	1854	578	209	530	537
Responses per entity	285 (6%)	296 (16%)	32 (6%)	52 (25%)	72 (14%)	140 (26%)
Number of managers and non-managers from sample per entity						
Managers in sample per entity	65 (23%)	67 (23%)	6 (19%)	11 (21%)	19 (26%)	31 (22%)
Non-managers in sample per entity	220 (77%)	229 (77%)	26 (81%)	41 (79%)	53 (74%)	109 (78%)

3.2 Factor scores

The UARM RCS-2018 data were used to assess the risk culture in each of the entities. This 5-point Likert scale provides data on two factors: Factor 1 measures the perceived level of integration of risk in decision-making processes (24 items). This factor is directly linked to the definition of risk culture used in this study. Factor 2 provides additional risk-culture-related data by measuring employee comfort with their own risk-related roles (18 items).

Descriptive and inferential statistical analyses were performed on the data. The Cronbach's alpha coefficient for this sample was 0.97, implying high internal consistency and scale reliability for the study sample. The score distributions of the factors were not bell-shaped as expected for normality. Since normality could not be assumed, statistically significant differences were identified using non-parametric tests at a 95% confidence level. To identify which groups differed, the Mann-Whitney U test was used when comparing two groups and the Kruskal-Wallis test was employed when comparing more than two groups.

Table 2: Risk culture scale

		UARM RCS- 2018 (FS = Factor score)				
		1. $0 \leq FS < 1.5$	1.5 $\leq FS < 2.5$	2. $2.5 \leq FS < 3.5$	3. $3.5 \leq FS < 4.5$	4. $4.5 \leq FS \leq 5.0$
Factor 1	Perceived level of integration of risk in decision-making processes	Very low level of perceived integration	Low level of perceived integration	Medium level of perceived integration	High level of perceived integration	Very high level of perceived integration
Factor 2	Comfort with own risk management role	Very low level of comfort	Low level of comfort	Medium level of comfort	High level of comfort	Very high level of comfort

The factor scores were calculated using the average of the responses over the items making up the factor. The UARM RCS risk-culture-maturity scale is shown in Table 2. The factor scores were

compared in three ways as shown in Figure 1. Initially, I reviewed the risk culture factors in the organisation as a whole (including head-office and its subsidiaries). Thereafter, factor scores of the subsidiaries were compared with the corresponding head-office results. Last, possible differences between management and non-management groups were also analysed.

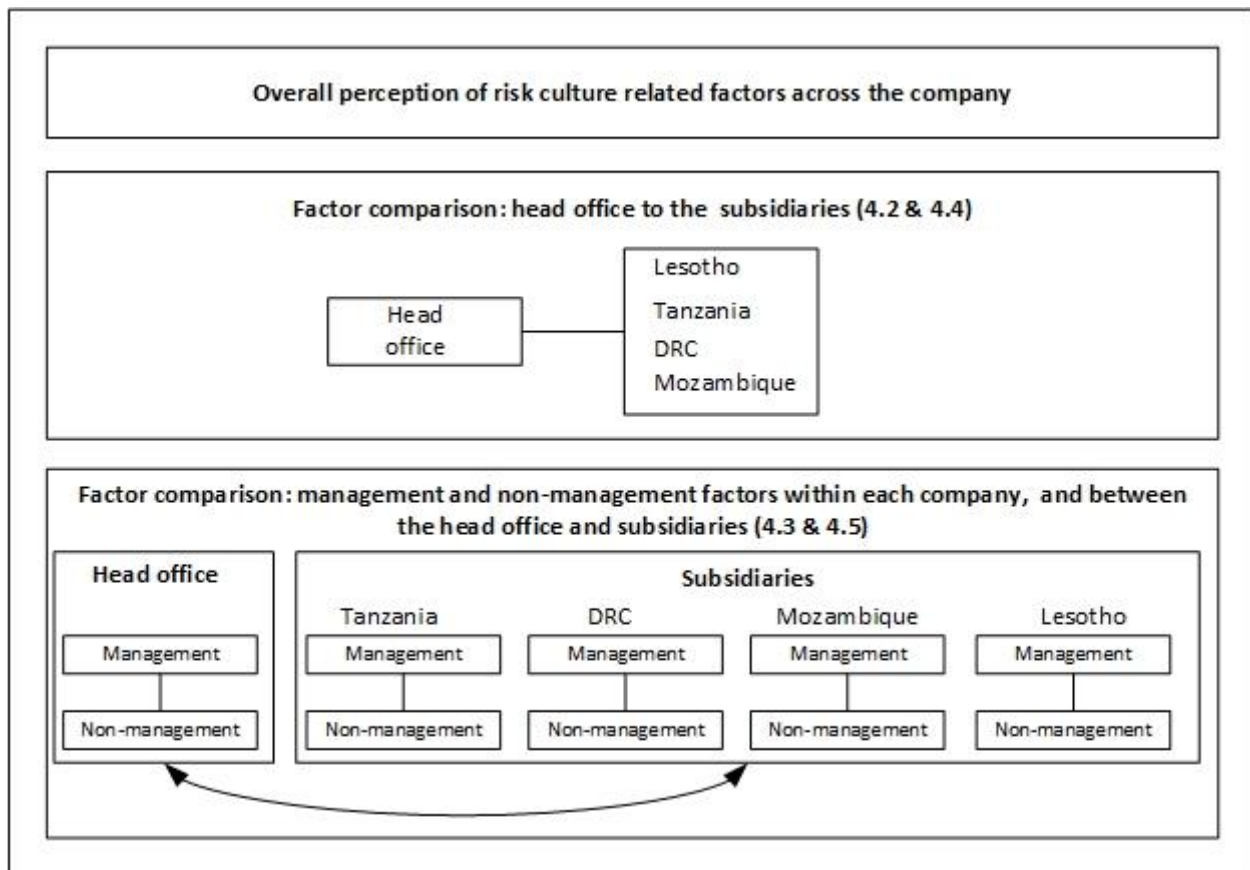


Figure 1: Diagrammatic representation of analysis conducted on the UARM RCS 2018 factor data.

3.3 Additional analyses

An option to select 'I do not know' was included for each scale item to avoid forced responses, thereby contaminating the results with spurious answers. The 'I do not know' responses were not included in the calculation of the factor scores but were analysed separately. Only participants with fewer than 30% 'I do not know' answers per factor were included in the calculation of the factor scores. This means that the respondents had to have answered at least 16 of the items in Factor 1 and 12 items in Factor 2 to be included in the calculation of the factor score. The separate analysis of the full data set's 'I do not know' answers provided valuable information on the levels of uncertainty about risk-culture-related aspects in the study sample that could be indicative of possible risk-related knowledge issues in the study population.

The final item in the survey provided respondents with the opportunity to explain their recommendations on what the organisation should start with in order to improve the inclusion of risk in decision-making. Answers to this item gave indications as to what they perceived the potential

critical problem areas within their company to be. This item allows for findings on what to do based on the results of the survey. Responses to this item were also analysed separately.

3.4 Lessons learned from the data collection method

Advantages

- The population was geographically distributed. Using an electronic survey method to collect the data was cheaper than a paper-based approach that would have involved using postal services for questionnaire delivery and collection for each country.
- The electronic survey method also provided a faster way to obtain data for analysis as no transcriptions were required as with, for example, qualitative time-consuming interview-based research methods.
- Data completion progress by each entity could be monitored and follow-up emails could be sent.
- Participants completed the survey individually and, unlike with interviews, the researcher could not influence or bias participants' responses.

Disadvantages

- Participants completed the survey anonymously. This resulted in not being able to identify which participants had already completed the questionnaire. Reminder emails could not target specific individuals and therefore had to be sent to the full group.
- Although English is the formal language used in the company, the official languages of some of the countries used in the survey are French and Portuguese. The survey was not translated into these languages, which could have had an impact on the number of respondents completing the questionnaire.
- During the time in which this survey was carried out, the company was running additional campaigns (an ethics survey, finance survey, etc.), which could have led to survey fatigue and therefore limited the number of participants who completed the survey.
- A possible negative aspect of sending the survey from the CRO was that lower level employees, or personnel working in a non-risk-related function in some entities, might not have been aware of who the CRO was, and might therefore have ignored the email.

3.5 Ethical considerations

Permission to conduct the study was granted by the NWU's ethics committee and the company's CRO. The researcher undertook not to reveal the company, subsidiary or participant identities, thereby ensuring their confidentiality and anonymity.

4. Results and discussion

The results are presented and discussed in the following sequence: participant demographics, the UARM RCS factor scores, the 'I don't know responses', and, finally, the suggested improvements for promoting risk culture in the company.

4.1 Study sample overview

Two-thirds of the study sample had a bachelor's or postgraduate degree and the rest had completed either high school or obtained a diploma (Table 3). Seventy percent had worked for the company for over 3 years (Table 4); furthermore, the percentage of respondents in the head-office had had a longer tenure with the company than personnel at the subsidiaries. This is mainly due to the South African operation being in existence longer than the subsidiary companies. Eighty-three percent of participants were older than 30 years (Table 5), with proportionally more older respondents being at head-office. The sample distributions related to educational level, age and length of tenure with the company provided confidence that this sample could contribute value to the study. This confidence was based on expected risk-related experience and exposure to be able to evaluate the company's approach to its risk management. The demographic data for this study are summarised in Tables 3–5. Detailed demographics are available in Appendix B.

Table 3: Level of education per market (percentage of sample)

	Head-office		Subsidiaries	
	Management	Non-management	Management	Non-management
High school	6	16	4	5
College	17	25	7	11
University bachelor's degree	23	25	36	52
University post-graduate degree	48	26	51	25
Other	6	9	1	7

Table 4: Number of years working for the company (percentage of sample)

	Head-office		Subsidiaries	
	Management	Non-management	Management	Non-management
<= 1 year	8	7	15	13
>1 year <= 3 years	14	14	21	26
>3 years <= 5 years	12	10	16	19
>5 years <= 10 years	22	19	25	24
>10 years	45	49	22	17

Table 5: Age range of participants (percentage of sample)

	Head-office		Subsidiaries	
	Management	Non-management	Management	Non-management
20–29	6	10	13	28
30–39	22	29	39	48
40–49	49	39	42	19
50–59	22	19	6	4
60 or older	1	8	0	3

4.2 Factor 1 scores: head-office versus subsidiary offices

The Factor 1 scores, providing a measure of perceived risk integration during decision-making, was 3.8 for all participants across the company (including all subsidiaries). The head-office and the combined subsidiary groups scored 3.7 and 3.9, respectively (Table 6). Likewise, all markets scored between 3.5 and 4.1, which indicate there was a high perception of integration of risk in the decision-making processes throughout the organisation according to the UARM RCS maturity scale (Table 2).

Table 6: Overall results for Factor 1

	Overall score	Head office	All subsidiaries	DRC	Lesotho	Mozambique	Tanzania
Factor 1	3.8	3.7	3.9	3.8	3.5	3.8	4.1

Pairwise Mann-Whitney U tests for statistically significant differences were performed between the Factor 1 scores of the head-office and each associated market. Only Tanzania showed a statistically significant difference from the head-office at a 95% confidence level for Factor 1, with Tanzania having a higher score for perceived integration of risk. This can be expected as Tanzania had the highest number of respondents of all the subsidiaries, with the other markets having fewer participants. The other subsidiaries would require larger differences to obtain a statistical difference compared to the head-office. Statistically significant differences may also have been obtained for larger participation in the other subsidiaries. For the rest of the article, therefore, I focus on the combined results for the subsidiaries and compare them with the corresponding head-office findings, rather than considering any differences in terms of each individual subsidiary. The Kruskal-Wallis test and the Pairwise Man-Whitney U tests per subsidiary are presented in Appendix C (Table 23, Table 24).

The Factor 1 differences for the combined subsidiaries in relation to the head-office (Table 7) showed an unexpected result in that the subsidiaries scored significantly higher on perceived level of risk integration in decision-making. Possible reasons for this are discussed in Section 4.6.

Table 7: Factor 1 test for statistically significant difference between head-office and combined subsidiaries

	n	Mann-Whitney U test Wilcoxon mean score	Chi-square test statistic	p-value	Significant difference at $\alpha = 0.05$?
<i>Factor 1: Perceived level of risk integration in organisation</i>					
Head-office	272	263.4	6.232	0.013	Yes
Subsidiaries	289	297.6			

4.3 Factor 1 comparison: management versus non-management

The values for Factor 1 for management and non-management across the company were 3.9 and 3.8, respectively (Table 8). Likewise, all groups of employees scored between 3.5 and 4.5, which indicates there was a high perception of integration of risk in the decision-making processes throughout the organisation on the basis of the UARM RCS maturity scale (Table 2).

Table 8: Overall perception of risk integration in the organisation

	Overall score	Head-office	All subsidiaries	DRC	Lesotho	Mozambique	Tanzania
Management	3.9	3.8	4.0	3.9	3.8	3.9	4.1
Non-management	3.8	3.7	3.8	3.8	3.4	3.7	4.0

No statistically significant differences were identified between management and non-management participant groups for any of the individual entities in terms of Factor 1. This indicates that management and non-management personnel per entity are similarly comfortable with the level of integration of risk in decision-making in the organisation. The Pairwise Mann-Whitney U test results, to evaluate the differences between management and non-management for each market, are available in Appendix C (Table 25, Table 26) for further information.

Due to the relatively small number of respondents for the subsidiaries, I did not compare employee levels between each individual entity and the head-office, but combined the subsidiaries' scores to provide an overall comparison with head-office. The Mann-Whitney U test (Table 9) showed no statistically significant difference between head-office managers and those in the subsidiaries. This finding could again be attributed to the small sample sizes at management level. However, statistically significant differences were identified, when comparing the non-managers groups between the two groups of companies, with non-managers in the subsidiaries reporting significantly higher perceived levels of risk integration in their organisations. Possible reasons for this unexpected result are discussed in Section 4.6.

Table 9: Mann-Whitney U tests to evaluate difference between levels of employees in head-office and combined subsidiaries

	Mann-Whitney U tests				
	n	Wilcoxon mean score	Chi-square test statistic	p-value	Significant difference at $\alpha = 0.05$?
<i>Factor 1: Perceived level of risk integration in organisation</i>					
Head-office: Management	62	59.9	1.543	0.214	No
Subsidiaries: Management	65	68.0			
Head-office: Non-management	210	204.2	4.589	0.032	Yes
Subsidiaries: Non-management	224	230.0			

4.4 Factor 2 scores: head-office versus subsidiary offices

The Factor 2 scores measure the respondents' comfort of with their risk management role. The Factor 2 score was 3.8 for all participants across the company (including all subsidiaries). Furthermore, head-office and the subsidiary groups scored 3.7 and 4.0, respectively (Table 10). Likewise, all markets scored in the high maturity bracket on perception of comfort with own risk management role on the UARM RCS maturity scale (Table 2).

Table 10: Overall results for Factor 2

	Overall score	Head-office	Combined subsidiaries	DRC	Lesotho	Mozambique	Tanzania
Factor 1	3.8	3.7	4.0	4.1	3.6	4.0	4.0

The statistical differences between the subsidiaries and the head-office (Table 11) again show an unexpected result, with the employees in subsidiaries reporting a significantly higher perceived level of comfort with their own role regarding risk management than those at head-office. Possible reasons for this are discussed in Section 4.6.

Table 11: Factor 2 test for statistically significant difference between head-office and combined subsidiaries

	n	Mann-Whitney U test Wilcoxon mean score	Chi-square test statistic	p-value	Significant difference at $\alpha = 0.05$?
<i>Factor 2: Perceived comfort with own risk management role</i>					
Head-office	282	259.7	17.500	<.0001	Yes
Subsidiaries	296	317.9			

4.5 Factor 2 comparison: management versus non-management

The Factor 2 values for managers and non-managers across the company were 4.0 and 3.8, respectively (Table 12). Likewise, all groups of employees scored in the high maturity bracket, which indicates there was a high perception of comfort with their risk management role by personnel throughout the organisation on the basis of the UARM RCS maturity scale (Table 2).

Table 12: Overall perception of comfort with own risk role

	Overall score	Head-office	Combined subsidiaries	DRC	Lesotho	Mozambique	Tanzania
Management	4.0	3.9	4.1	4.3	3.9	4.1	4.1
Non-management	3.8	3.7	3.9	4.0	3.6	3.9	4.0

Statistically significant differences were identified overall for Factor 2 between management and non-management, with managers more comfortable with their risk management roles than non-managers throughout the organisation (Table 13). This is an expected result, as management is more involved in the risk management processes, such as submitting reports to the executive

committees or boards on risk-related matters and therefore they should be more comfortable with their risk roles.

Table 13: Mann-Whitney U test to evaluate statistical difference between management groups for Factor 2

Company	n	Mann-Whitney U test		p-value	Significant difference at $\alpha = 0.05$?
		Wilcoxon mean score	Chi-square test statistic		
Factor 2: Perceived comfort with own risk management role					
Management	131	327.4	8.746	0.003	Yes
Non-management	447	278.4			

Statistically significant difference were identified on both the management and non-management levels, with the subsidiaries scoring significantly higher than the head-office (Table 14). This is again contrary to initial expectations. Possible reasons for this are discussed in Section 4.6.

Table 14: Mann-Whitney U tests to evaluate differences between levels of employees in head-office and subsidiaries combined regarding their comfort with their risk role.

Mann-Whitney U tests					
	n	Wilcoxon mean score	Chi-square test statistic	p-value	Significant difference at α = 0.05?
<i>Factor2: Comfort with own risk role</i>					
Head-office: Management	64	57.7	6.044	0.014	Yes
Subsidiaries: Management	67	74.0			
Head-office: Non-management	218	202.3	12.069	0.001	Yes
Subsidiaries: Non-management	229	244.7			

4.6 Discussion of factor-related findings

The objective of the study was to assess the respective risk cultures of a South African head-office and its subsidiary companies in Africa. The values obtained for both Factor 1 and Factor 2 using the UARM RCS 2018 scale showed a high perceived level of risk integration in the decision-making processes in the organisation and of employees' comfort with their own role in risk management. This indicates a general perception of a high risk culture in the company.

When evaluating the risk culture between head-office and the subsidiaries, the latter consistently scored significantly higher than that of the head-office, with the subsidiaries showing significantly higher scores, on both Factor 1 and Factor 2. This result was unexpected as the risk management department drives the risk management programme from the head-office. Furthermore, risk-training programmes for management and risk-awareness campaigns were implemented at the head-office over the past year. One possible explanation for the lower scores at head-office is that its personnel reported a longer tenure with the company and may have been more informed and realistic about the risk culture in the organisation. In contrast, more recently recruited employees in the subsidiaries could be providing a more optimistic view of the risk culture where

they worked, leading to their greater positive responses compared to the head-office personnel (Donaldson & Grant-Vallone, 2002).

As discussed in the limitations of the study (Section 3.4), the invitation to participate was sent from the Group CRO; non-risk-related business units within the subsidiaries therefore might not have responded to the survey, and so this population representation perhaps provided a skewed view. Another possible reason for these differences could be that respondents in the subsidiary markets might have been from risk-related functions and departments. The participants were not asked whether they worked in a risk- or business-related function in the survey, so this possibility could not be investigated. Further research is therefore required to understand and identify the role of participants in such a study.

Moreover, the number of employees per company differs, with the staff complement in the head-office approximately three times the size of their combined total in the subsidiaries (Table 1). Given this, it can be assumed that in smaller organisations, risk-related information is distributed more widely, due to fewer silos within the operations. Schneider, Ehrhart, and Macey (2013) aver that employees who interact more, where leaders communicate more with staff due to the relative proximity of distance (e.g. between managers and non-managers), and where clear vision is set, the culture in those entities might be stronger.

The participation rate in the head-office and some of the subsidiaries was small, potentially due to survey fatigue, which could have led to the results not showing representative views of the study population. Additionally, the survey was sent to countries that have English, Sesotho, French and Portuguese as their home language. Only a third of the participants declared that English was their first language so that further research is required to determine of a higher participant response rate would have been achieved and if a non-English first-language participant would have a different understanding of the items were the UARM RSC 2018 scale to be translated into their local tongue.

The risk culture evaluations between management and non-management showed that managers in general had a better perception of risk culture. This is an expected result, as management would be more involved in the risk management processes such as updating risk registers or submitting risk reports to the executive committees or boards on risk-related matters and therefore should be more comfortable with their risk role. Another possible explanation relating to managers reporting a higher perception of risk culture is that the management group has a higher level of education, as shown in Table 3, meaning that they could potentially be considering a wider range of decisions, including risk in these decisions.

When evaluating the risk culture of the managers and non-managers throughout the organisation, no significant difference was identified for managers' perception of the integration of risk during decision-making. However, non-managers in the subsidiaries scored significantly higher than non-managers in head-office. One possible reason for this is that the non-managers in the subsidiaries had worked for the company for a shorter time than their counterparts at head-office and therefore may have a less informed and a more optimistic view of risk integration in the company.

The management and non-management staff in the subsidiaries scored significantly higher than the corresponding groups at head-office, in respect of their evaluating comfort with their own risk management roles. A shorter length of tenure in the subsidiaries could again have influenced the outcome of this result, due to them having a more inexperienced and optimistic view of their own risk management abilities.

The unexpected higher scores of respondents in the subsidiary companies relative to those in head-office may therefore be explained by head-office employees having been longer with the company, having greater oversight of risk, being more exposed to risk management training and therefore being better informed than the subsidiaries. All of which provided a more realistic perception of the risk culture for the company.

One additional explanation for the unexpected results could be that the UARM RCS 2018 scale was not valid for the studied population studied. However, the scale has been validated in 12 independent studies and the results are most probably sample-based as discussed above.

4.7 Additional analysis

'I don't know' response analysis

For each of the items in the questionnaire, participants were given the opportunity to answer, 'I don't know', where they either did not understand the item or did not know the answer to it. The 'I don't know' option was not included in the factor calculations and is therefore analysed separately here.

As shown in Figure 2, respondents in both head-office and the subsidiaries were able to answer most of the items. However, there was a concentration of items (34, 39, 40, 41 and 42) that elicited a higher percentage of 'I don't know' answers. Table 15 shows the corresponding response rates for management and non-management for these items.

Table 15: Highest 'I don't know' response percentage per employee level (in descending order of 'I don't know')

Item	Item description	Management: I don't know (%)	Non-management: I don't know (%)
39	The organisation rewards staff members who take responsible risks.	23	35
42	Managers use risk management as criterion when evaluating the performance of staff members.	20	31
40	The organisation punishes staff members who take irresponsible risks.	21	26
41	Managers treat staff fairly when a risk materialises (i.e. when a risk event occurs).	17	23
34	I understand how to use risk management principles when making work-related decisions.	11	17

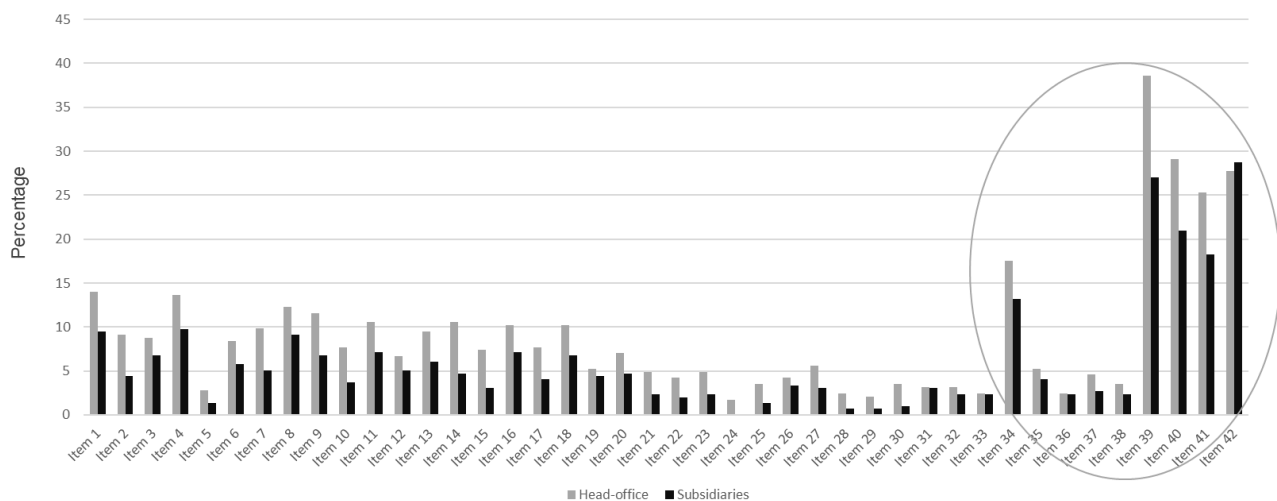


Figure 2: Percentage of 'I don't know' answers between head-office and subsidiaries

Items 39, 40, 41 and 42 relate to the organisation's approach to promoting risk management practices, using incentives or punishments. Figure 2 shows that some employees are not aware if the organisation holds them accountable for risk-based decision-making. These results can be expected, as the company does not include risk management as a separate item in the employees' performance agreement contracts. Instead, the organisation deems risk management to be implicit in employee performance contracts as the approach is that risk management is an essential enabler for meeting the business unit strategy.

Item 34 relates to understanding the risk management principles during the decision-making process. This was an unexpected result, especially within the head-office environment (Figure 2), as awareness campaigns and training programmes had been implemented at management level at the head-office and are not supported by the high maturity levels indicated by comfort with own risk management (Factor 2). However, one needs to take into account the low percentages of persons selecting 'I don't know' here when evaluating this result, as it may be a spurious outcome to be investigated in future studies. Such future research should take into account that it seems that mainly non-managers selected this option, as seen in Table 15.

Table 16: The lowest 'I don't know' responses in ascending order

Item	Item description	Management: I don't know (%)	Non-management: I don't know (%)
24	I understand what the term 'risk' means.	1	1
29	I understand the consequences of not managing the risks connected to my role.	2	1
28	I understand how to manage risk as part of my work role.	1	2
5	I trust the messages from management on risk-related issues.	3	2

The items with the lowest 'I don't know' responses were 5, 24, 28 and 29, as shown in Table 16. Participants in this study therefore believe that they understand the meaning of the term 'risk' (item 24) and their role regarding risk management (item 28). The low rate of the 'I don't know' response to item 29, compared to the high 'I don't know' response rate on the incentives-related items

discussed above (Table 15), could be because the respondents interpret item 29 as referring to the organisational, rather than the personal, consequences of risk management. Such interpretation links to the understanding of the risk theme in the other low 'I don't know' items. A suggestion from this study is that item 29 be rephrased in the 2019 version of the scale, to refer to the organisational consequences if risk is not managed, to reduce possible uncertainty about the meaning of this item.

Evaluating the 'What needs to change first?' diagnostic item

The scale contained an additional non-factor-related item: 'To improve the inclusion of risk in decision-making in the organisation, I believe that we must start with improving...' with the options shown in Table 17. The distribution of answers to this item provides an indication as to what most respondents believe is a priority to improve the risk culture in their entities. Data per employee group for each entity are available in Appendix D.

Table 17: 'What needs to improve first?', ranked in descending order (options were displayed in alphabetical order to the participants)

What need to improve first	Percentage (%)
Effective communication and challenge on decision-related risks	23
Accountability for including risk when making decisions	12
Leadership: tone from the top about the active inclusion of risk when making decisions	12
Risk management framework (functions, systems, processes, data)	11
Shared understanding of risk	11
Group dynamics: how risk is included in decision-making in different groups in the organisation	10
Risk-related role clarity	8
Structural incentives for including risk when making decisions (e.g. remuneration, succession planning and talent development)	8
Quality of risk-related information	6

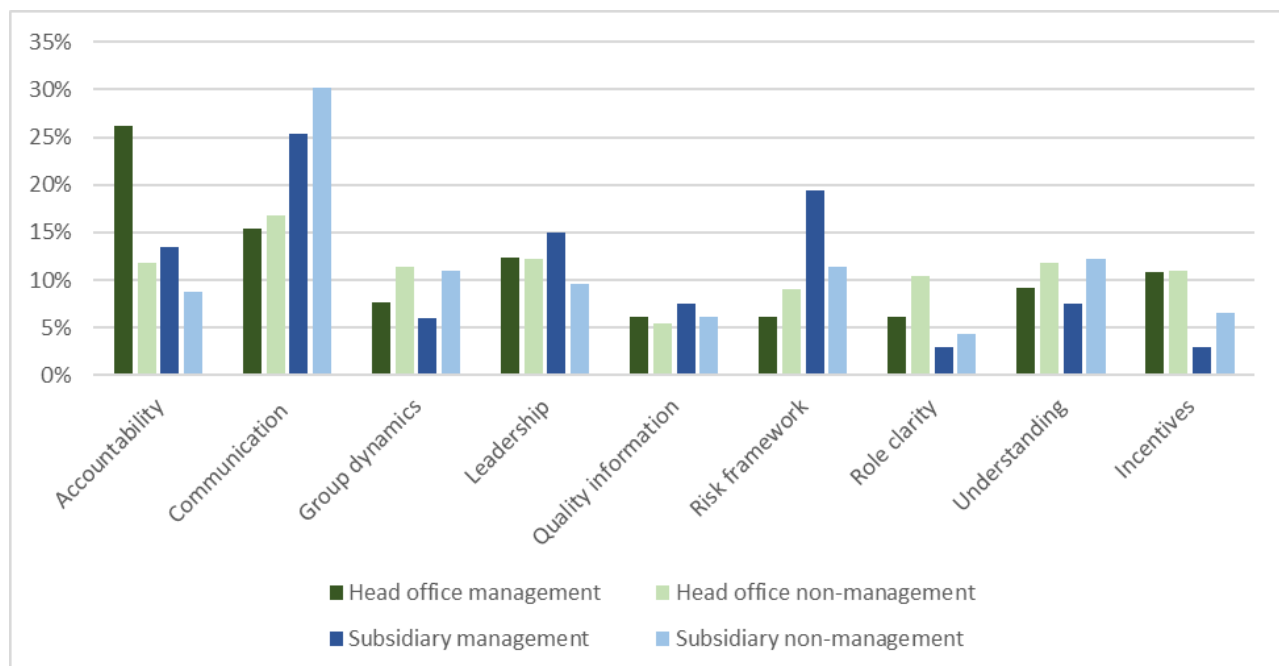


Figure 3: 'What need to improve first?' – Comparison between head-office and combined subsidiaries management and non-management groups.

Highest selected options

Overall, effective communication and challenge on decision-related risk, at 23%, was selected as the most important area for improvement (see Table 17). When further analysing the data between the different groups (Figure 3), the employees in the subsidiaries at all levels selected this option more than head-office staff. This is an expected result as the risk department is located in South Africa and communication between the head-office and its distant subsidiaries could be hampered by a lack of effective collaboration with non-risk-related functions. The higher response rate of the non-management employees in the subsidiaries could potentially also be attributed to the risk department communicating to the management level within the subsidiaries, rather than to the non-management. However, analysing this option is complicated by the inclusion of two behaviours in one option, namely, communication and challenge. Therefore, if a respondent felt strongly about either communication or challenge, they would have selected this option. This issue will be corrected for the 2019 version of the scale. In the current results, further research is required to identify how participants understood the item.

Next, accountability was most selected, at 12% overall. Figure 3 shows that this option was selected most by the head-office management team. A possible explanation is that head-office management would like to see more reward and punishment for good/inappropriate risk behaviour that could lead to more accountability for risk as they have been through risk management training, as discussed in Section 2. This is also supported by the number of employees who selected 'I don't know' for items 39, 40, 41 and 42 (as shown in Figure 2), which also related to incentives and accountability for risk.

Leadership and tone from the top were the next most-selected options, at 12% each. The response rates were similar across the groups analysed. This could indicate that employees are keen to follow the organisation's leaders, but that they would also like to see more leadership action regarding risk-related issues. This is an area where the organisation could investigate how the tone from the top, related to the active inclusion of risk during decision-making, could be improved.

Of the remaining options, a surprising result was that there was a high percentage (19%) of managers within the subsidiaries who selected 'risk management framework (functions, systems, processes, and data)' as the one which needs to be improved first. One possible explanation for this could be that risk policies and frameworks are developed at the head-office without input from the subsidiaries. Another possible explanation is that employees within the South African head-office were trained on risk management in 2017 and therefore feel more confident about their ability to use the policies and frameworks. This could be an indication that more awareness and training are required regarding the risk policies in the subsidiary groups.

Lowest selected options

The quality of risk-related information had the lowest value (6%), which could imply that the perceived view is that current risk reporting is sufficient for the organisation's needs. This might mean

that the risk participants perceive that the new risk reports, discussed in the Background section, provide the head-office and committees sufficient risk information for those stakeholders' requirements.

At 8%, employees also did not believe that incentives for including risk when making decisions were particularly important to improve the organisation's risk culture. However, head-office respondents selected this option more than personnel in the subsidiaries. Risk-related role clarity also had a value of 8% overall, with the subsidiary entities scoring lower than the head-office for both the management as well as the non-management groups. This could indicate that groups within the subsidiary markets believe that they understand what their role is regarding risk management. As discussed in Section 4.6, employees in the subsidiaries demonstrated significantly higher comfort with understanding their risk-related roles than head-office.

Although these options were selected the least, the item requested that participants should select the aspects that should improve first. However, it is important that these lower-rated answers are not discarded and that further enquiry is required to investigate what needs to be improved on all selected options.

5. Conclusion

The pilot UARM RCS 2018 scale provided an indication that risk culture perceptions varied between the different employee levels and between head-office and the subsidiaries. Management tended to feel more confident about their understanding of their risk-related roles than staff in general. However, newer subsidiary companies had a more optimistic view of the perceived level of integration of risk than that of head-office personnel. This pilot study provides results that could form the basis for further, more focused studies within the organisation.

People, groups and nations feel, think and act according to the national and home cultures to which they belong. Consequently, multicultural work environments are expected to influence the risk culture within an organisation. Sheedy et al. (2017) identified that national culture and regulatory environments could impact on an organisation's culture. Given the resources available for this research project, this study focused on organisational risk culture and did not include the influence of respondents' home backgrounds or of national cultures on risk culture. Future studies therefore could include reviewing the influence which national culture could have on the risk culture within the organisation. Sheedy et al. (2017) also suggest that employees within the same business unit tend to show levels of agreements regarding their approach to risk culture. For example, employees within a sales environment may have a different perception of risk culture from that of personnel within a governance setting. Therefore, further research is required to evaluate the difference in risk culture at a business unit level within the company, with the aim of identifying focus areas for improvement.

In addition, the sample limitations discussed in the article indicate a need for more careful sample designs in future studies. The study populations may also have been influenced by respondent self-selection in which participants who are positive about their roles take the time to

complete the survey. These study limitations should be investigated in further research, using additional methods such as interviews at management and non-management levels, testing employees' understanding of risk management, as well as the collection of evidence of how risk principles were acknowledged during decision-making processes.

Developing and sustaining a mature risk culture needs active support from the board and executive management in an organisation, resulting in a strong tone from the top to ensure that there is clear accountability and responsibility for risk management within the company. Further research initiated and supported by the board and executive management could assist the organisation to reach its goals in this regard.

This research demonstrated how a focused risk culture scale can be used as part of an exploratory study in response to the need for multinational telecommunications companies to measure and monitor their risk cultures. The results and lessons learned during this exploratory investigation provide a basis for further studies, as well as valuable pointers for other multinational companies on how to evaluate the risk cultures between geographically separate entities to inform risk culture improvement programmes.

(Word count – 7977)

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REFLECTION

I undertook this programme, as I was interested in evaluating and improving the risk culture at the telecommunications company where I work. The research study answered questions that I had about the company and provided insights as to what was required for improvement. The study built on two previous studies conducted in 2016. Programmes within the South African head-office were implemented after the 2016 studies and I was interested if these changes had had an impact on the organisation.

There was an assumption within the company that although we were improving our risk management implementation systems and strategy throughout the organisation (head-office and distant subsidiaries), that the head-office had a stronger risk culture than that of the subsidiaries. This was mainly due to the group risk management department being physically located in South Africa with a resulting stronger influence within the head-office. The second assumption was that, within our subsidiary markets, management understood the principles of risk management; however, these risk principles were not always communicated and accepted by non-management employees in the subsidiary companies. The results of this study, however, showed a different picture. Some findings indicated that management had a strong perception of risk integration when making decisions. However, non-management employees' perception of risk integration was not as poor as expected.

Article readiness for publication

The accredited journal *Foresight* (ISSN 1463-6689), selected as a possible journal for publication of this study, accepts articles of between 5000 and 7000 words. Therefore, this academic article will need to conform to the journal's specifications. As this study was exploratory, and the participation rate was low, further work is required to increase the response rates to provide a more sound study. Furthermore, additional data collection methods could be included, such as observations of risk inclusion in decision-making and interviews to cross-reference the perceived risk culture survey to obtain a more realistic interpretation of the results.

Personal insights

After starting my studies, the organisation that I worked for made changes to how it approached risk management. These changes required that I increase my travel to our subsidiary markets in Africa as well as adding to my workload in South Africa. After receiving the results of my first assignment, therefore, I started to question if I was suited for this programme and if its timing was conducive to the pressures that I was under at work. I then made the conscious decision that I needed to persevere and prove to colleagues and myself that I could continue with the programme and made a concerted effort to be diligent with my studies. Furthermore, I had the vision that a study of this nature would not only be beneficial to myself, but would assist the organisation in maturing its risk management objectives.

Prior to the study, my exposure to the risk management environment was mainly on the 'symbols' level, as defined by Hofstede et al. (2010), such as the implementation of risk policies, collecting risk information and reporting on this information. Performing this study exposed me to a different aspect of risk management, namely, the people and social aspects of how risk is accepted within the organisation. My personal learning during this project was to experience how research projects are performed.

Next steps and recommendations

The results of the study were presented to the management groups within each of the operations and were well accepted. Most subsidiaries welcomed further studies of this nature, to ascertain their level of risk culture. As this was the first study that measured risk culture within the subsidiary companies, their respective managements were interested in applying what was learnt from this study and to implement programmes to maintain and further strengthen their risk culture. They furthermore made suggestions such as creating awareness campaigns prior to future studies of this nature or making the survey mandatory to increase participation rates.

To ensure that the findings from this study are translated into actionable risk culture programmes, the group risk management department will communicate to the internal communication department and other stakeholders to improve communication about risk to the subsidiary companies. Furthermore, risk management training will be rolled out to the subsidiary markets to ensure that a similar level of understanding regarding the risk management system is understood and that staff understand the risk process better.

APPENDICES

Appendix A

UARM Risk Culture Scale (UARM RCS-2018)

An Overview

Hermien Zaaiman and Hedré Pretorius

Aims

This document provides a summary of the North-West University (NWU)'s Centre of Applied Risk Management (UARM) Risk Culture Scale (UARM RCS). Current approaches to risk culture tend to be qualitative, using a general view of what risk culture is. Where risk culture questionnaires are applied, it is important to ascertain the validity and reliability of the resulting information against the broad construct of risk culture. The UARM Risk Culture Scale (UARM RCS) was developed to meet the need for an academically validated instrument to measure the risk culture in organisations.

Approach

Multiple definitions of risk culture exist in regulatory papers and risk standards. One of the more comprehensive definitions is that of the Basel Committee on Banking Supervision (BCBS) defining risk culture as: 'A bank's norms, attitudes and behaviours related to risk awareness, risk-taking and risk management, and controls that shape decisions on risks. Risk culture influences the decisions of management and employees during the day-to-day activities and has an impact on the risks they assume' (BCBS, 2015, p. 2).

However, applying such broad definitions to evaluate and improve the risk cultures of organisations is complex. This process requires the development of instruments to assess and measure specific aspects of risk culture. The UARM RCS was developed using our decision-focused view of risk culture as basis for the development and testing of its items:

'The risk culture of an organisational group is manifested by the importance given to considering risk when the group makes decisions. The level of explicit inclusion of risk in decision-making represents the implicit, subjective value afforded to risk by the group.'

The scale items were therefore developed to represent aspects of the integration of items in risk culture based on our Risk Culture Indicator (RCI) model, described by Zaaiman in the Appendix: 'Risk Culture Indicator Model – An Overview'.

Status

The UARM RCS provides three sets of results that can be used to assess the

1) Two risk-culture-related factors

The 42-item five-point Likert scale has been developed and piloted over 3 years (2016-2018). The scale is now mature and can be regarded as valid, as the scale items map to the RCI model and has shown in multiple studies to work well across sectors, functions and management levels (content validity). The scale also shows a high Cronbach α reliability coefficient of 0.97 (internal consistency).

The scale measures two risk-culture-related factors:

- Perceived level of integration of risk in decision-making processes (24 items)
Note: Although the items cover the indicators in the RCI Model, only one factor is found in the answer data. This can be ascribed to the interlinked nature of the indicators and provides an indication of the validity of the scale for the study of this aspect of risk culture.
- Comfort with own risk management role (18 items)

The factor scores are calculated as the average of the responses over the items making up the factor. This translates to the following risk-culture-maturity scale for the decision-based view of risk culture used in this study.

		UARM RCS- 2018 (FS = Factor Score)				
		1.0<=FS<1.5	1.5<=FS<2.5	2.5<=FS<3.5	3.5<=FS<4.5	4.5<=FS<=5.0
Factor 1	Perceived level of integration of risk in decision-making processes	Very low level of perceived integration	Low level of perceived integration	Medium level of perceived integration	High level of perceived integration	Very high level of perceived integration
Factor 2	Comfort with own risk management role	Very low level of comfort	Low level of comfort	Medium level of comfort	High level of comfort	Very high level of comfort

2) The I-do-not-know/I-do-not-understand-the-statement answer option

Item response options include an 'I do not know' or 'I do not understand the statement' option to mitigate possible spurious effects of respondents who truly do not know the answer to an item. The I-do-not-know answers were not included in the scale's factor analysis, and only participants with fewer than 30% of I-do-not-know answers (per factor) were included in the calculation of the factor scores. This means that the participant had to have answered at least 16 of the items in factor 1 and 12 items in factor 2 to be included in the calculation of the factor score.

In addition, the full set of the study's I-do-not-know answers are analysed separately, thereby providing valuable information on the levels of uncertainty about risk-culture-related aspects in the study sample(s) that could be indicative of possible risk-related knowledge in the study population(s).

3) The what-needs-to-change-first diagnostic question

The scale also contains a further RCI model-based diagnostic question:

'To improve the inclusion of risk in decision-making in the organisation, I believe that we must start with improving....'

Evaluating the responses to this question allow for suggestions on the way forward on improving the risk culture of the organisation.

Interpretation of results

When the scale is applied, the results have to be interpreted in the context of the study for which the results were obtained.

To keep in mind when analysing and interpreting the scale results:

- 1) In a questionnaire like this, only the group response makes sense and the individual's factor score cannot be used as an indication of the individual's 'risk culture' as culture is always a group concept.
- 2) Maturity levels of the measured factor could be inflated by response biases (e.g. social desirability influence).
- 3) The results of the scale are valid at factor level. As scale-based factor is based on the coherence for the group of items that make up the factor. These items were designed based on the measurement aims of the scale but do not contain every possible item that could have been used. Other items that refer to the construct may have shown the same result, implying that focusing on differences at item level could divert the user's attention to inadequately tested aspects of the underlying construct, while not considering the validated construct. The scale is able to provide indications of where risk culture-related issues lie in the organisation, and was not designed to identify micro-level issues. Other scales and research methods are required to do detailed follow-up investigations.

For more information on the UARM RCS, please contact: Hermien Zaaiman at
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Appendix B

Demographic information for each entity is shown in the tables below.

Table 18: Level of education per market, comparing management with non-management (percentage)

	Head-office		DRC		Lesotho		Mozambique		Tanzania	
	M	NM	M	NM	M	NM	M	NM	M	NM
High school	4	35	0	0	1	0	2	10	0	2
College	11	55	0	1	1	4	1	2	3	18
University bachelor's degree	15	54	5	16	3	22	4	26	12	55
University post-graduate degree	31	57	1	8	6	13	12	12	15	25
Other	4	19	0	1	0	2	0	3	1	9

*M = Management; NM = non-management

Table 19: Number of years working for each company, comparing management with non-management (percentage)

	Head-office		DRC		Lesotho		Mozambique		Tanzania	
	M	NM	M	NM	M	NM	M	NM	M	NM
<= 1 year	5	16	0	2	2	5	1	4	7	19
>1 years <= 3 years	9	31	2	4	4	9	0	21	8	26
> 3 years <= 5 years	8	23	1	6	1	11	5	11	4	16
>5 years <= 10 years	14	42	1	5	2	9	8	12	6	30
>10 years	29	108	2	9	2	7	5	5	6	18

*M = Management; NM = non-management

Table 20: Age range of participants per company, comparing management with non-management (percentage)

	Head-office		DRC		Lesotho		Mozambique		Tanzania	
	M	NM	M	NM	M	NM	M	NM	M	NM
18–19	0	0	0	1	0	0	0	0	0	0
20–29	4	21	0	5	3	11	3	21	3	27
30–39	14	64	2	8	3	21	8	26	13	54
40–49	32	85	3	5	3	7	8	6	14	25
50–59	14	42	1	7	2	1	0	0	1	1

*M = Management; NM = non-management

Table 21: Nationality of respondents (percentage)

Basotho	9
Congolese	5
Mozambican	12
South African	48
Tanzanian	23
Other	3

Table 22: English first language? response rate (percentage)

Yes	33
No	67

Appendix C

The information within this appendix shows the difference per subsidiary group to the head-office which can be used for further analysis of the data. These sets of results were excluded from the article's analysis due to the unequal and small participation rates across the different subsidiary groups.

Table 21 shows that when evaluating the head-office in relation to each of the subsidiaries, statistical differences were identified using the Kruskal-Wallis test for each factor.

Table 23: Kruskal-Wallis test to identify statistical difference between the head-office and subsidiaries

Company	n	Wilcoxon mean score	Chi square test statistic	p-value	Significant difference at $\alpha = 0.05$?
Factor 1: Perceived level of risk integration in organisation					
Head-office	272	263.4	25.171	<.0001	Yes
DRC	32	279.1			
Lesotho	48	235.4			
Mozambique	71	267.5			
Tanzania	138	339.0			
Factor 2: Perceived comfort with own risk management role					
Head-office	282	259.7	24.839	<.0001	Yes
DRC	32	346.0			
Lesotho	52	266.8			
Mozambique	72	309.8			
Tanzania	140	334.5			

Pairwise Man-Whitney U tests were then performed to identify which markets differed from the head-office. Table 22 shows that Tanzania's mean score is significantly higher than that of head-office for Factor 1. Furthermore, head-office also significantly differs from DRC, Mozambique and Tanzania for Factor 2, with employees in these subsidiaries showing a greater degree of comfort with their role in risk management. Differences between different subsidiary groups were also identified, although these fell outside the scope of this study.

Table 24: Pairwise Mann-Whitney U tests to identify significant differences between the head-office and each subsidiary market

Level of role	n	Wilcoxon mean score	Chi square test statistic	p-value	Significant difference at $\alpha = 0.05$?
<i>Factor1: Perceived level of risk integration in organisation</i>					
Head-office	272	187.0	19.605	<.0001	Yes
Tanzania	138	241.9			
<i>Factor 2: Perceived comfort with own risk management role</i>					
Head-office	282	152.7	7.665	0.006	Yes
DRC	32	199.6	5.841	0.016	Yes
Head-office	282	170.9			
Mozambique	72	203.54	18.512	<.0001	Yes
Head-office	282	193.54			
Tanzania	140	247.7			

Furthermore, as described in Section 4.3, no statistically significant differences were identified between management and non-management participant groups within any of the individual entities when evaluating Factor 1 and Factor 2. The Pairwise Mann-Whitney U tests, testing the differences between employees for each market, are shown in Table 23 and Table 24.

Table 25: Pairwise Mann-Whitney U tests between management and non-management per entity for Factor 1

	n	Wilcoxon mean score	Chi square test statistic	p-value
Factor1: Perceived level of risk integration in organisation				
		Head-office		
Management	62	144.2	0.763	0.382
Non-management	210	134.2		
		DRC		
Management	6	17.3	0.047	0.828
Non-management	26	16.3		
		Lesotho		
Management	10	26.2	0.176	0.675
Non-management	38	24.3		
		Mozambique		
Management	19	39.6	0.792	0.374
Non-management	52	34.7		
		Tanzania		
Management	30	75.0	0.721	0.396
Non-management	108	68.0		

Table 26: Pairwise Mann-Whitney U tests between management and non-management per entity for Factor 2

	n	Wilcoxon mean score	Chi square test statistic	p-value
Factor 2: Perceived comfort with own risk management role				
		Head-office		
Management	64	158.7	3.700	0.054
Non-management	218	136.4		
		DRC		
Management	6	17.3	0.058	0.809
Non-management	26	16.3		
		Lesotho		
Management	11	30.3	0.886	0.347
Non-management	41	25.5		
		Mozambique		
Management	19	42.8	2.314	0.128
Non-management	53	34.3		
		Tanzania		
Management	31	82.6	3.559	0.059
Non-management	109	67.1		

Appendix D

‘What need to change first?’ to improve risk culture per entity group, depicting the different levels of employees’ responses.

Table 27: What need to change first per entity and per employee level (percentage)

	Head-office		DRC		Lesotho		Mozambique		Tanzania	
	M	NM	M	NM	M	NM	M	NM	M	NM
Accountability	26.2	11.8	16.7	3.8	9.1	2.4	5.3	3.8	19.4	14.7
Communication and challenge	15.4	16.8	33.3	30.8	27.3	26.8	15.8	30.2	29.0	31.2
Group dynamics	7.7	11.4	0.0	7.7	9.1	12.2	5.3	15.1	6.5	9.2
Leadership	12.3	12.3	0.0	3.8	18.2	17.1	26.3	11.3	9.7	7.3
Quality information	6.2	5.5	0.0	19.2	9.1	2.4	15.8	7.5	3.2	3.7
Framework	6.2	9.1	0.0	3.8	9.1	22.0	21.1	5.7	25.8	11.9
Role clarity	6.2	10.5	33.3	7.7	0.0	0.0	0.0	5.7	0.0	4.6
Understanding	9.2	11.8	16.7	11.5	18.2	12.2	5.3	15.1	3.2	11.0
Incentives	10.8	10.9	0.0	11.5	0.0	4.9	5.3	5.7	3.2	6.4

* M = Management; NM = non-management