

Comparing senior and middle manager perceptions of risk culture in a mining company

J van Wyk

 **orcid.org 0000-0001-8006-3543**

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

Supervisor: Mr JF Goede

Graduation ceremony: April 2019

Student number: 10658890

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

Managers apply risk management when seeking balance between risk taking and reward. The existence of a mature risk culture, rather than the presence of risk management capability, confirms the value that risk management contributes to the achievement of organisational strategies. This study assessed differences in perceptions of risk culture maturity between 31 top and 225 senior mining managers, and among a corporate office and two groups of 10 mining facilities. Risk culture maturity perceptions were assessed by applying the North-West University Centre for Applied Risk Management Risk Culture Scale (UARM RCS-2018). Results from the UARM RCS-2018 assessment confirmed that the management of the mining company studied perceived it to have a mature risk culture. However, there were significant differences in perceptions of risk culture at a 5% probability between both the top and senior management levels, and between the corporate office and the two groups of mining facilities. Twenty-three percent of participating managers selected 'lack of accountability for managing risk' as a priority item to improve the inclusion of risk in decision-making. The outcome of the study could be useful to board and executive members, since it confirms that the company's investment in risk management capability enabled a risk management approach in support of risk-informed decision-making. In view of the lack of academic risk culture research available to the mining industry, this study offers introductory research that confirms risk management's value by verifying the existence of a mature risk culture rather than assessing risk management capability.

Keywords: risk culture, risk decision-making, global financial crises, risk management

ACKNOWLEDGEMENTS

I would like to thank my Lord and Saviour Jesus Christ for being there for me through this journey of enhancing my earthly knowledge. Thank you, Holy Spirit, for the comfort and strength provided so graciously, helping me overcome various challenges along the way. May the fruit of this endeavour be to the benefit of God's eternal kingdom.

Thank you to my beloved wife Nicolette and our four children, Andrea, Carla, Anton and Hugo, for their tireless encouragement and support under testing circumstances.

My sincere gratitude and appreciation to the board and executive committee of the mining company studied, affording me an opportunity with the necessary support to complete this article. Great honour and admiration are due specifically to the risk management team for their openness and overwhelming assistance that made it possible for me to grow my insight and understanding about their company in a most pleasant manner.

Finally, I want to thank the UARM team under the leadership of Professor Hermien Zaaiman for the professional but entertaining learning experience provided. I thank also Hedré Pretorius for her help with the statistics. Special thanks are due to my supervisor, Fred Goede, for his support, assistance and guidance in completing this mini-dissertation. I admire your honest feedback and practical sharing of knowledge gained throughout your career.

TABLE OF CONTENTS

PREFACE	i
ABSTRACT	ii
ACKNOWLEDGEMENTS.....	iii
LIST OF TABLES	v
LIST OF FIGURES	v
RESEARCH PROJECT OVERVIEW	1
ARTICLE	3
1. Abstract.....	3
2. Introduction	4
3. Background	5
3.1 South African mining	5
3.2 Characteristics of the mining industry	6
3.3 Overview of risk management in listed mining companies	6
3.4 The organisation studied	7
3.5 The relationship between risk, risk management and risk culture	7
3.6 Focus on risk culture	8
3.7 Tone at the top	10
3.8 Accountability for managing risk	11
3.9 Risk-based compensation	12
4. Method	12
4.1 Research methodology	12
4.2 Study population	13
4.3 Data sources	14
4.4 Data analysis.....	15
4.5 Benefits and limitations of data collection	17
4.6 Research ethics	17
5. Results and Discussion	17
5.1 Participant analysis	17
5.2 Risk culture assessment	18
5.3 Comparative risk culture assessments	19
5.4 Interpretation of items and suggestions for mitigation.....	22
5.5 Diagnostic questions and the 'I don't know' assessment	24
6. Conclusion	30
7. References.....	32
REFLECTION	40
APPENDICES	42

LIST OF TABLES

Table 1: Diagnostic items included in the risk culture survey	14
Table 2: Risk culture maturity scale related to a decision-based view of risk culture	15
Table 3: Survey response rates for the different mine facilities	18
Table 4: Risk culture maturity scores per factor for different participant groups	19
Table 5: Descriptive statistics per factor for top and senior management distributions	20
Table 6: Wilcoxon rank sum test results per factor for top and senior management	20
Table 7: Factor based descriptive statistics for Corporate Office, Big 4 and Other mining facility distributions	21
Table 8: Kruskal-Wallis test results for Corporate Office, Big 4 and Other mining facilities per factor	21
Table 9: Kruskal-Wallis results used for comparing each combination of the predefined company groups for Factor 1	22
Table 10: Suggested priority of risk management aspects that would best improve the inclusion of risk in company decision-making.	25
Table 11: Participant suggestions for 'other' owners	27
Table 12: 'Other' risks categories suggested by participants	28

LIST OF FIGURES

Figure 1: Outcome of perceived risk ownership selected by management participants	26
Figure 2: Outcome of perceived risk considered by management participants when completing the survey	28
Figure 3: Percentage of 'I don't know' responses selected per item for top and senior management participants	29

RESEARCH PROJECT OVERVIEW

Study in relation to the field of risk management

Risk management should support strategic decision-making (March & Shapira, 1987). It makes available relevant and updated information regarding uncertainties associated with company-chosen strategies and objectives (COSO, 2017). However, unless it leads to strategic risk-informed decision-making, it merely serves as compliance mechanism creating a false sense of value (FSB, 2014). The 2008 global financial crisis has shown that risk-informed decision-making is not always embraced by executives, which creates a concern for investors, regulators and other stakeholders (Sheedy, Griffin, & Barbour, 2017). This study is about evaluating risk-informed decision-making, by assessing the risk culture maturity of an organisation, and thereby confirming the value obtained from risk management.

Interest in topic

When scrutinising recent annual reports from listed mining companies, evidence was presented that risk management programmes have been integrated with business activities and strategic decision-making. However, the evidence that was presented by some of the mining companies did not correspond with the personal experiences I had in visiting close to 100 different mining facilities in South Africa, as a contractor working in the mining services industry. In my view, some of the mining companies were overstating their risk management capability, which made me wonder how investors judged the executive leadership's ability to execute strategies and objectives successfully.

Post mortems of the 2008 global financial crisis cited risk culture maturity as the distinguishing factor between financial companies that were unaffected by the crisis, and the ones that were bankrupted (Coluccia, Fontana, Graziano, Rossi, & Solimene, 2017). Noting that the mining industry is less regulated than banking, should investors perhaps not demand an assessment of an organisations risk culture maturity, as proof of leadership's ability to sustainably optimise organisational value? As no other studies were found on risk culture in the mining industry, I wanted to explore the UARM RCS-2018 approach to assess risk culture, as a first step in answering my question.

Intended audiences

This study is intended to add to the existing body of academic risk culture knowledge specifically related to the mining industry and also to highlight new areas for research. The study should be valuable to board members, executive personnel and senior management as it assesses the study organisation's risk culture maturity with the aim of confirming the added value of risk management.

The study is also aimed at board members, executive personnel and senior management, in providing an impression of the current organisational risk culture, grounded mostly on their added

perceived value and associated investment in companywide risk management. Risk practitioners might benefit from the suggestions made as to how to improve risk culture in the mining industry.

Selected journal

The *Journal of Risk Research* was selected as the preferred journal for publication of this article. Consideration was given to the fact that the journal is peer-reviewed, has an acceptable impact factor (2016: 1.34), a clear scope of preferred content and comprehensive author requirements. This periodical has published articles that featured inter-relationships between risk, decision-making and organisational players in the engineering industry, which relate to some of the main aspects covered in this article. Since this journal is published internationally, it would, one hopes, spark more debate about risk culture in the international mining community. More information regarding the journal can be accessed at the following internet link: <https://www.tandfonline.com/loi/rjrr20>

The final selection and submission to a journal will be proceeded by a re-working of article content, formatting and layout, taking cognisance of examination feedback and the synergy between this study and the journal's objectives.

References

- Coluccia, D., Fontana, S., Graziano, E. A., Rossi, M., & Solimene, S. (2017). Does risk culture affect banks' volatility? The case of the G-SIBs. *Corporate Ownership & Control*, 15(1), 33-43. doi:doi:10.22495/cocv15i1art3
- COSO. (2017). Enterprise Risk Management: Integrating with Strategy and Performance. Retrieved from <https://www.coso.org/Pages/ERM-Framework-Purchase.aspx>
- FSB. (2014). Guidance on supervisory interaction with financial institutions on risk culture: a framework for assessing risk culture. Retrieved from <http://www.fsb.org/2014/04/140407/>
- March, J. G., & Shapira, Z. (1987). Managerial Perspectives on Risk and Risk Taking. *Management Science*, 33(11), 1404-1418.
- Sheedy, E. A., Griffin, B., & Barbour, J. P. (2017). A Framework and Measure for Examining Risk Climate in Financial Institutions. *Journal of Business and Psychology*, 32(1), 101-116. doi:10.1007/s10869-015-9424-7

ARTICLE

Comparing top and senior manager perceptions of risk culture in a mining company

1. Abstract

Managers apply risk management when seeking balance between risk taking and reward. The existence of a mature risk culture, rather than the presence of risk management capability, confirms the value that risk management contributes to the achievement of organisational strategies. This study assessed differences in perceptions of risk culture maturity between 31 top and 225 senior mining managers, and among a corporate office and two groups of 10 mining facilities. Risk culture maturity perceptions were assessed by applying the North-West University Centre for Applied Risk Management Risk Culture Scale (UARM RCS-2018). Results from the UARM RCS-2018 assessment confirmed that the management of the mining company studied perceived it to have a mature risk culture. However, there were significant differences in perceptions of risk culture at a 5% probability between both the top and senior management levels, and between the corporate office and the two groups of mining facilities. Twenty-three percent of participating managers selected 'lack of accountability for managing risk' as a priority item to improve the inclusion of risk in decision-making. The outcome of the study could be useful to board and executive members, since it confirms that the company's investment in risk management capability enabled a risk management approach in support of risk-informed decision-making. In view of the lack of academic risk culture research available to the mining industry, this study offers introductory research that confirms risk management's value by verifying the existence of a mature risk culture rather than assessing risk management capability.

Keywords: risk culture, risk decision-making, global financial crises, risk management

2. Introduction

Post-mortem reviews of the most recent global financial crisis of 2008 (GFC) revealed a disconnect between actual and documented risk profiles at various multinational financial organisations (De Jonghe, Edelsten, & Xavier, 2013). The risk management practised by boards and legislators at these organisations failed to protect stakeholder interests. Risk management's value in contributing to the achievement of organisational strategies and objectives cannot be assessed by evaluating organisational risk management capability, but rather by verifying the presence of a mature risk culture (Coluccia et al., 2017; DNB, 2015; Sheedy & Griffin, 2017).

The listed mining company reviewed in this study invested in risk management capability from 2012 onwards and views risk management as a strategic enabler. Even so, the company's risk culture has never been assessed before, causing uncertainty about the added value of its risk management approach. This study aimed to fill this gap and assessed management's perception of risk culture maturity at top (Patterson E or F band) and senior (Patterson D band) management levels across facilities by performing a questionnaire-based risk culture assessment (Holmes, 1981).

The study followed a survey-based research approach and involved collecting data from 256 out of a population of 638 managers. The survey was performed across 10 mining facilities and their corporate office by applying the North-West University's 2018 Centre of Applied Risk Management (UARM) Risk Culture Scale (UARM RCS-2018). The UARM RCS-2018 comprises 42 items that assess two risk-culture-related factors, namely, (1) the perceived level of integration of risk in decision-making processes, and (2) the perceived comfort with one's own risk management role.

The study also assessed three diagnostic type questions. The first question forms part of the UARM RCS-2018 suite of 43 items and asked participants to rank 9 predefined options 'to best improve the inclusion of risk in decision making'. The two additional questions investigated company-specific risk management issues raised by the company's risk department. More specifically, the second question assessed management's capacity for considering internal and external company risk and the third question verified if managers took ownership of company risk.

The study attempted to answer the following research questions:

- What is the perceived risk culture of the organisation, top and senior management level employees, and the different mining facilities?
- Does management's perception of risk culture differ significantly, between top and senior management levels, and across the different mining facilities?
- What could be the reason for statistically significant differences and how can they be mitigated, should they exist?

The results of the study could be useful to the board and executive members of the mining company studied, as they might confirm the added value of recent efforts to implement risk management. Management would benefit from knowing whether the company's current risk management approach is suitable to support strategic decision-making and fulfil its intended role as a strategic enabler. Risk practitioners might gain new insight on how to improve further the risk management approach by considering the improvements suggested by the respondents to the questionnaire.

There is a perhaps surprising lack of academic research on risk culture available to the mining industry, so that this study offers introductory research that explains some aspects and potential benefits related to the concept of risk culture. Mining companies would possibly understand the link between risk management and risk culture better from reading this paper. In general, this study adds to the existing body of risk culture knowledge by presenting introductory research on the mining industry and suggests areas for further study. Lastly, it is hoped that once listed mining companies familiarise themselves with the concept of risk culture, their annual public reporting would be expanded also to include confirmation about the status of their risk culture.

The rest of the work is structured as follows: Section 3 contextualises the mining industry with focus on listed companies and provides background on relevant academic theory related to risk culture; Section 4 describes the method, data analysis and ethical considerations used to conduct the research; Section 5 presents the results and discussion; and Section 6 discusses the conclusions.

3. Background

3.1 South African mining

After more than 130 years of mining, South Africa still holds considerable quantities of known mineral reserves in global terms, namely, platinum group metals (91%), chromium (39%), manganese (29%), gold (11%), diamonds (9%), coal (1.4%) and iron ore (1%) (BGR, 2017; Minerals Council South Africa, 2016; U.S. Geological Survey, 2018). Reserve quantities on their own give a one-sided view of South Africa's mining potential without also considering geological appeal and country-specific policies (Ashley & Green, 2018). When applying these criteria, South Africa was rated in the 51st position for its mining investment attractiveness compared with 90 competing destinations (Ashley & Green, 2018). Locally, mining's contribution to gross domestic product has declined from an estimated 21% in 1980 to 6.8% in 2017 (Minerals Council South Africa, 2018; South Africa. Statistics South Africa, 2017, 2018a). However, for a decade up to 2016, the sale of mining commodities still generated a handsome average 24% of total foreign exchange (Minerals Council South Africa, 2017). The industry provided 2.8% of formal direct employment in the first quarter of 2018 (South Africa. Statistics South Africa, 2018b).

3.2 Characteristics of the mining industry

The mining industry has unique characteristics that affect its risk profile. The development or extension of mining projects is capital intensive with long lead times before first revenue generation (Benning, 2000; South Africa. Davis Tax Committee, 2016). Mining projects have a finite life-span because of their dependence on non-renewable mineral resources (Richards, 2006). Production facilities are geographically captured, making them vulnerable to government philosophy and associated policies (South Africa. Davis Tax Committee, 2016). Mining companies are price-takers, unable to recover cost increases from final consumers because of their dependence on cyclical global commodity trading (Simonsen & Perry, 1999). Closure liabilities generally escalate over the lifespan of projects as legislative requirements are constantly evolving to better protect the environment against industrial impacts (ICMM, 2005).

3.3 Overview of risk management in listed mining companies

Mining companies rely on quantitative risk management techniques from various specialist fields to support decision-making with regard to investments, acquisitions, new developments, projects, hedging transactions, insurance placements and compliance matters (Brūmelis, Brown, Nikodemus, & Tjarve, 1999; Davies & Kijko, 2003; Dhanani, 2003; Joy, 2004; Kennedy, 1990, pp. 413, 436; Tufano, 1996). The integrated use of risk-based principles and techniques in the fields of corporate governance, sustainable development and regulatory compliance probably encourages mining companies to apply risk management across organisations by adopting a common risk language that emphasises sustainable value creation (Australia. Department of Resources, 2008; ICMM, 2015; IISD, 2007; IODSA, 2016; ISO, 2018; Kimbrough & Compton, 2009; OECD, 2011). In fact, some of the most valuable listed mining companies describe risk management as a strategic differentiator applied in pursuit of sustainable value creation (BHP, 2017; Glencore, 2018; S&P Global, 2017).

In listed mining companies risk management is often cited for its supporting or enabling role in strategic decision-making (Barrick Gold, 2018; BHP, 2017; China Molybdenum, 2018; Fresnillo, 2018; Glencore, 2018). In these organisations' oversight of risk-based decision-making happens at board and subcommittee level generally staffed by varying combinations of highly qualified and experienced board, executive, top management and specialist members (Freeport-McMoRan, 2018; South 32, 2018; Vedanta, 2018). Oversight typically involves: (1) the approval and ongoing optimisation of risk appetite statements, (2) assessment of principal strategic risks, (3) verification of risk frameworks, and (4) the reviewing of management reports (Agrium, 2018; Franco-Nevada, 2018; Norilsk Nickel, 2017; Rio Tinto, 2018; Vale, 2018). Annual reports classically provide details about principal, significant, material or top risks in varying detail often following international guidelines or legislative requirements (Agrium, 2018; Newmont Mining, 2018; Saudi Arabian Mining, 2018).

Companies often provide separate financial risk reporting with regard to their exposure to liquidity, commodity pricing, foreign exchange, interest rates and credit profiles (Hindustan Zinc, 2017)

Listed mining organisations mostly have dedicated head office-based risk management departments that provide services across the organisation supported by senior management level employees at operating facilities with either shared or dedicated risk responsibility (Merafe Resources, 2018; Vale, 2018). Risk departments are often headed by a group risk manager with direct reporting responsibility at both executive and board committee level, who reports to a financial executive head. Risk responsibility with regard to health, safety and sustainable development are often excluded from the risk department's mandate and structured under a different executive head (Lonmin, 2018). The complexity of risk management structures usually mimics the overall complexity of the organisation.

3.4 The organisation studied

The organisation studied is a diversified listed mining resources company with interests in the metallurgical, chemical and energy markets. Although the company has a global footprint, the study reported here focused on the South African-based operations including their corporate office and 10 mining facilities. The company pursued an enterprise risk management implementation programme from 2012 onwards and views risk management as a strategic enabler rather than a financial compliance vehicle. The company leadership acknowledged in their 2016 integrated report that effective risk management is dependent on a proactive risk culture, with employees understanding their role in managing risks in their environment. A global financial services organisation rated the company's risk management capability as 'mature' during a governance, risk and compliance maturity and integrated assurance assessment performed in 2017.

3.5 The relationship between risk, risk management and risk culture

Publicly listed organisations create value by achieving board-approved strategies and objectives without compromising long-term shareholder value in line with missions, visions and core values (COSO, 2017; IODSA, 2016; Sheedy et al., 2017). Risk has been defined as 'the effect of uncertainty on objectives' (ISO, 2018). As managers welcome positive effects of uncertainty, they are more concerned with minimising probable negative impacts on objectives (Kimbrough & Compton, 2009; Tversky & Fox, 1995). As negative impacts destroy value, managers must decide how much upfront value they are going to sacrifice to prepare themselves against the impacts of the most likely value-destroying events (Aven, 2012; March & Shapira, 1987). Managers therefore seek an optimum balance between risk taking and reward by making decisions about future uncertain events (De Jonghe et al., 2013; DNB, 2015; IRM, 2012).

Organisations apply risk management to contextualise future uncertainty on objectives (Kimbrough & Compton, 2009). Risk management is defined as 'coordinated activities to direct and control

an organisation with regards to risk' (ISO, 2018). However, the recent financial crisis challenged the effectiveness of risk management when various multinational organisations were unable to successfully navigate the impacts of the subprime mortgage market (Australia. Prudential Regulation Authority, 2016). The risk management practised in boardrooms failed to mitigate value-destroying events. Post-mortem studies verified that effective risk management in financial organisations was dependent on the existence of a mature risk culture (Sheedy & Griffin, 2017).

A comparison of top risks identified in publicly listed mining company reports, is yielding many similarities, and varies mostly only in priority between organisations (Anglo American, 2017; BHP, 2017; Rio Tinto, 2018). Unless these companies have separate risk registers not shared in public, the boards of these companies act to mitigate the effects of similar probable events of uncertainty. Investors are put at ease with similar high-level risk mitigation strategies in organisations that are structured differently, have varying mineral reserves, operate in different territories and have different management teams. The mining industry could therefore be as ill-prepared as was the financial industry when having to face a series of global disruptive events. Thus, owing to the complexity associated with identifying disruptive events, mining companies could learn from the financial industry and improve risk decision-making by establishing mature risk cultures.

3.6 Focus on risk culture

Risk culture is a complex concept containing a mixture of hard and soft factors, making it difficult to discuss, assess and influence (IIF, 2013). From an organisational perspective, 'risk culture' is a sub-culture of organisational culture. Because of the newness of the concept, it is important to understand the fundamentals behind organisational culture (IRM, 2012; Palermo, Power, & Ashby, 2017; Ring, Bryce, McKinney, & Webb, 2016). According to Schein (2017, p. 6), 'organisational culture refers to accumulated shared learnings of a group applied to solving problems of external adaption and internal integration based on successful experiences in the past.' Organisations are distinguished from one another based on 'collective programming of the mind' (Hofstede, Hofstede, & Minkov, 2010, p. 344). These authors found that organisations do not have shared value systems, but rather a shared understanding of organisational practices (Hofstede et al., 2010, pp. 346-349).

Both Schein and Hofstede explain organisational culture as existing in different layers, much like an onion with layers from the inside to the outer layer. According to Schein (2017, pp. 17-30), there are three layers of culture present in groups operating in an organisation. On the inside exists a set of underlying core beliefs and values determining a group's preferred behaviours, perceptions, thoughts and feelings. These core beliefs and values cannot be measured directly, are extremely difficult to change and cause group anxiety when challenged. At a layer above lie espoused beliefs reflecting a group's aspiration in an ideal world. This level is also referred to as the strategic level, as it concerns itself with strategic beliefs of where the organisation should be heading and can be determined by examining the vision, strategy and high-level objectives as compiled by senior

management (Lundberg, 1990). Because espoused beliefs do not correlate with actual performance, they leave areas of behaviour unexplained, creating a feeling that some areas of culture are still out of hand. At the outer layer lie visible and touchable artefacts, which are products of underlying assumptions and therefore a manifestation of culture.

Owing to the newness of the concept of risk culture, there is still variance in the literature concerning explanations and definitions regarding this construct, making it difficult to explain to others (Aven, 2012; Aven & Zio, 2014). At this stage only a few academic authors have published articles about risk culture, with only Bozeman and Kingsley (1998) offering their own definition: 'the organisation's propensity to take risks as perceived by the managers in the organisation'. The definition of the Institute of Risk Management (IRM) is often cited to explain the concept: 'the values, beliefs, knowledge and understanding about risk, shared by a group of people with a common purpose' (Coluccia et al., 2017; IRM, 2012; Ring et al., 2016). The IRM's definition relates to Schein's work about organisational culture also referring to the importance of group dynamics in risk culture. Bozeman and Kinsley's definition is important as it adds a dimension of decision-making by referring to an 'organisation's propensity to take risks'.

The Basel Committee on Banking Supervision (BCBS) considered both group dynamics and decision making when 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). In line with the BCBS definition of risk culture, the UARM developed its own decision-focussed definition of risk culture, as a basis for testing its RCS-2018 items. This definition was adopted for the work presented in this paper:

'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.'

Organisational core beliefs and values cannot be assessed directly, but organisational management can rely on assessments of visible and touchable artefacts of culture to get a sense of possible shortcomings and improvement opportunities. Because of global pressure exerted on regulators to prevent further financial crises (EY, 2014; IIF, 2009), the Financial Services Board created a well-respected framework for assessing risk culture, which has been used by most industry players to advance their work on risk culture, also creating new indicators for assessment purposes (Australia. Prudential Regulation Authority, 2016; BCBS, 2015; DNB, 2015; FSB, 2014, 2017; Power, Ashby, & Palermo, 2013). Despite these advances, there has been much contention in measuring risk culture related to: (1) compliance overload (DNB, 2015), (2) credibility of measurement instruments (Sheedy et al., 2017), (3) complexity of the concept (IIF, 2013), (4) questionable interpretive capability of

advisors and regulators (Spicer et al., 2016), and (5) a general lack of academically supported research (Palermo et al., 2017).

According to the Financial Services Board, several indicators can be assessed to determine the maturity of an organisation's risk culture. For this purpose, when assessing an organisation's risk culture, indicators must be considered collectively as they are mutually reinforcing (FSB, 2014). The following three sections provide a summarised overview of key aspects debated in the literature concerning assessment indicators: tone at the top, accountability for managing risk, and risk-based compensation. The UARM RCS-2018 considers these three indicators when assessing risk culture maturity.

3.7 Tone at the top

Boards and senior management are responsible for setting the tone at the top, which should align with organisations' values in support of a desired risk culture and associated behaviours (FSB, 2014). To establish a strong risk culture, leadership is encouraged to share a clear strategic vision based on the organisation's values and to communicate it often to reemphasise longer-term aims and provide clarity about leadership expectations (Sheedy et al., 2017). According to Hoogervorst (2017), leadership success in obtaining its strategic vision depends on its ability to establish a coherent and consistent culture that aligns with agreed values. To improve consistency and allow for more effective decision-making, leaders should translate their strategic vision into a clearly defined organisational strategy and risk appetite framework (FSB, 2014).

Senior management are advised to promote risk management as the common thread running through decision-making at all levels of the organisation (IIF, 2013). They should always remember that employees constantly scrutinise their views and decisions for subtle cues about their preferences and perceived value of risk management (Sitkin & Pablo, 1992). The effectiveness of risk management is dependent on the establishment of an effective risk culture (IMA, 2014a). Managers are encouraged to recognise, practise, promote and reward behaviour that reflects a desired risk culture in support of organisational values (FSB, 2014). Employees should know they can participate in exchanging unrestricted views and feel safe enough to challenge and debate issues involving critical decisions (FSB, 2014).

As it remains the board's responsibility to encourage behaviour consistent with organisational risk appetite frameworks, it should make sure that it creates the necessary infrastructure to enable adequate oversight of risk management practices supporting a mature risk culture (IIF, 2009; Sheedy et al., 2017). Board members should design oversight structures to allow for sufficient discussion of financial and non-financial risk matters that consider the complexity and risk profile of the particular business (Brown, Steen, & Foreman, 2009; Choi, 2013; Coluccia et al., 2017; Eggleston & Ware, 2009). Where appropriate, the use of dedicated risk committees provides the benefit of allowing deep dives into risk matters that concern the board and other leaders of the

business (Coluccia et al., 2017; FSB, 2014). The effectiveness of oversight committees, and particularly the risk committee, can be strengthened by appointing influential independent non-executive leaders with the necessary experience and knowledge to provide the required risk-related oversight (FSB, 2014).

3.8 Accountability for managing risk

The three lines of defence model was used to explain the different risk management accountabilities within organisations (EY, 2014; Sheedy & Griffin, 2017). Risk management accountability lies with: (1) every employee in the organisation (line 1); (2) an independent risk department (line 2); and (3) internal and external auditing, the board and compliance institutions (line 3). Accountable functions are expected to establish clearly defined responsibilities with regard to monitoring, identification, management and mitigation of risks (FSB, 2014). The three lines of defence model for risk management specifies overall functional responsibilities but provides little insight into the risk culture needed to support appropriate behaviours.

Compliance with requirements stipulated in the company's risk management framework could create a false sense of the effectiveness of risk management within an organisation (Sheedy & Griffin, 2017). It is, rather, a mature risk culture embedded within an organisation that confirms proper risk management (IIF, 2008). Employees' accountabilities towards their risk management responsibilities are influenced by their perception of the overall organisational priority afforded to risk-related matters combined with their observations about rewarded practices (Sheedy et al., 2017). There is evidence that senior managers sometimes ignore breaches that impact organisational risk profiles as well as shunning contact with employees who raise issues that are in conflict with management's espoused values (Sheedy & Griffin, 2017). Overall risk accountability can be improved by creating clear expectations, strengthening reporting structures and facilitating alignment between risk and business incentives (Coluccia et al., 2017; FSB, 2014).

Organisations have to deal with risk cultures that vary among countries, between different management levels and across business units (Bozeman & Kingsley, 1998; FSB, 2014; Sheedy & Griffin, 2017; Sheedy et al., 2017). Risk culture may differ in subgroups because individuals identify more closely with known employees in a particular group through frequent interaction caused by regular social activity (Anderson & West, 1998). Supervisors of subgroups create different perceptions of risk culture among their teams as they have flexibility to interpret risk systems and group culture in their own unique way (Zohar, 2000). It is therefore important that organisations understand how culture varies across the business to ensure that employees who partake in unintended risk behaviour face strict but consistent consequences (FSB, 2014; IIF, 2013)

After the financial crisis of 2008 the role of chief risk officer (CRO) was enhanced by introducing direct reporting responsibility to the chief executive officer. This change was made to emphasise the importance of risk management within organisations (Coluccia et al., 2017; FSB, 2014). CROs are

responsible for providing leadership in managing enterprise risk, including reporting to all board committees according to their risk mandate (Coluccia et al., 2017). In summary, CROs must balance the realities of organisational risk profiles against risk appetites defined by boards (FSB, 2014). Although the role of CROs is important, Sheedy and Griffin (2017) remind us that 'the mere existence of a well-paid CRO does not guarantee an effective risk management function nor a culture that prioritises risk management'.

3.9 Risk-based compensation

Remuneration, performance evaluation and promotion systems should support longer-term interests of both the organisation and clients, as opposed to engaging in excessive risk taking with the aim of maximising short-term revenue generation in support of earning large bonuses (FSB, 2014; Sheedy & Griffin, 2017). During the financial crisis of 2008, excessive risk taking was supported by the incentive schemes of the banking industry as institutional investors pressurised bank managers for higher returns on investments (SSG, 2009). Incentive schemes were sales driven and employers negotiated lucrative contracts with high-performing individuals they wanted to retain at all costs (SSG, 2009). The increasing tendency of governments to bail out financial institutions considered 'too big to fail' might have encouraged wilful engagement in excessive risk taking (Sheedy et al., 2017). As the mining industry is well known for generous employee incentive schemes, it could be susceptible to similar abuses as were recorded during the 2008 financial crisis.

After the financial crisis, regulators and supervisors became more prescriptive about the requirements of incentive compensation programmes in the financial industry. Compensation systems had to include assessment criteria that evaluated employee performance by also imposing adherence to predetermined risk limits (FSB, 2014). Objective setting processes and annual performance reviews were required to link back to company values and behaviours consistent with sustainable long-term performance (FSB, 2014). Compliance with risk frameworks were required to carry significant weight during performance assessments, promotions and as part of development plans of organisations (FSB, 2014). In general, employee compensation systems were expected to encourage risk-informed decision-making in support of company values (Bozeman & Kingsley, 1998).

4. Method

4.1 Research methodology

This study followed a survey-based quantitative research methodology by collecting primary research data from participants using the North-West University's Centre for Applied Risk Management Risk Culture Scale (UARM RCS-2018). More details about the UARM RCS-2018 are available in Appendix B.

4.2 Study population

The study population included all 638 top and senior management level employees working for the company's South African operations consisting of a head office and 10 production facilities. All top and senior management level employees were included in the study group, to increase the overall representation of results, especially at facilities with relatively small management populations. The company defines top managers as employees with role descriptions on the Patterson E or F band, and senior managers as employees on the Patterson D band (Holmes, 1981). For completeness sake it must be recognised that employees outside of the selected study population also contribute to overall company risk culture. The non-management employees were excluded for the purposes of this study, as the limitations of a mini-dissertation format prescribed for the UARM 873 masters programme, would possibly not have allowed for comprehensive reporting on a more expanded scope of work. However, this study limitation presents an opportunity for further risk culture research at the lower echelons of the organisation.

4.3 Data sources

The survey had two sections. The first section obtained demographic data through 9 selection type items. The second section consisted of the 42-item UARM RCS-2018 assessment and three additional diagnostic type items (Appendix B). The first additional diagnostic type item (named DTI-1) forms part of the UARM RCS-2018 43-item suite, and the two additional diagnostic type items (referred to as DTI-2 and DTI-3) were added to investigate company specific risk management issues.

The UARM RCS-2018 assessment comprises 42 five-level Likert scale type statements that assess two risk-culture-related factors. Likert scale type items included an 'I do not know' or 'I do not understand the statement' response option. Factors 1 and 2 assessed the perceived level of integration of risk in decision-making processes (24 items), and the participant's comfort with their own risk management roles (18 items), respectively. Table 1 lists the diagnostic items that were included in the risk culture survey.

Table 1: Diagnostic items included in the risk culture survey

UARM RCS-2018 item:	
DTI-1: To improve the inclusion of risk in decision-making in the organisation, I believe that we must start with improving.... (select only one of the options below - options provided in alphabetical order)	
○ Accountability for including risk when making decisions ○ Effective communication and challenge on decision-related risks ○ Group dynamics: how risk is included in decision-making in different groups in the organisation ○ Leadership: tone from the top about the active inclusion of risk when making decisions	○ Quality of risk-related information ○ Risk management framework (functions, systems, processes, data) ○ Risk-related role clarity ○ Shared understanding of risk ○ Structural incentives for including risk when making decisions (e.g. remuneration, succession planning and talent development)
Study-specific items:	
DTI-2: Who owns risk in the organisation? (select only one of the options below)	
○ Risk Function ○ Finance ○ Coal Operations ○ Business Development ○ Human Resources ○ Project and Technology ○ Stakeholder Affairs ○ Sustainability	○ Group Company Secretary and Legal ○ EXCO ○ Board ○ CEO ○ Shareholders ○ Every decision-making management member (All) ○ I do not know ○ Other (please specify)
DTI-3: What type of risk were you considering when you evaluated [company's name] risk in the questionnaire? (select only one of the options below)	
○ Financial ○ Project ○ Insurance ○ Fraud ○ Operational ○ Safety and Health ○ Environmental	○ Quality ○ Stakeholder ○ Legal ○ Human Resource ○ Strategic ○ Any risk impacting the organisation's objectives ○ Other (please specify)

The survey was administered by the company's top management representative responsible for risk management, through an email explaining the aims, objectives and benefits of the study, also containing a link to a web-based program that collected all data (Appendix C). Managers were asked to complete the survey between 17 and 30 April 2018. Two reminders were sent, the first on day 4 and the second on day 8, after the questionnaire was initially distributed.

4.4 Data analysis

The demographic data collected were used to group participant responses in preparation for different statistical analyses. Key demographic statistics were calculated, and results are presented in Appendix A. A survey participant analysis was performed by calculating the overall and individual facility response rates.

4.4.1 Grouping of mining facilities

To simplify the statistical analyses required to verify significant differences between the corporate office and 10 mining facilities, they were split into three groups. The 4 larger and 6 smaller mining facilities were grouped together in terms of their full-time employee count. The grouping of facilities was motivated by the company wanting to confirm if its generous spending on support services at the larger facilities translated into more mature perceived risk cultures. The company accepted that this study was not designed to verify this statement. The corporate office was grouped separately, to verify risk culture differences compared with the grouped mining facilities. The three groups were named Corporate Office, Big 4 (four larger mining facilities) and Other mining facilities (six smaller mining facilities).

4.4.2 Risk culture assessment

The perceived risk culture had to be determined for the organisation, top and senior management level employees, and of Corporate Office, Big 4 and Other mining facilities. The perceived risk culture was determined according to the UARM RCS-2018's decision-based risk culture maturity scale as listed in Table 2. On this scale, risk culture is described according to a risk culture maturity level, which is determined by comparing the risk culture maturity factor score against the different scales, and then reading the associated maturity level.

Table 2: Risk culture maturity scale related to a decision-based view of risk culture

Risk-culture-related factors		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

Source: Appendix B

Risk culture maturity factor scores were obtained for the different groupings by calculating the average of the averages for each of the associated survey items in UARM RCS-2018 according to participant ratings.

4.4.3 Comparative risk culture assessments

Risk culture comparison between top and senior management

Participating top and senior management level employees' perceptions of risk culture had to be compared with each other to analyse for significant differences. The top and senior management UARM RCS-2018 survey item response averages were calculated for Factor 1 and Factor 2 and compared. It was necessary to determine if the 4 distributions calculated in this manner followed a normal distribution, to determine whether to use a parametric or non-parametric method of comparison. Descriptive statistics were calculated for the 4 distributions to verify a parametric assumption of normality. Since the parametric assumption of normality did not hold, a non-parametric method was used to test for significant differences in factor distributions between top and senior management. Factor-based Wilcoxon scores were calculated for both top and senior management distributions, which were then used to calculate the Wilcoxon rank sum (Mann-Whitney) test and obtain results per item and factor at a 5% probability level. The results were used to verify whether there were significant differences between the two management groups per item and factor.

Risk culture comparison between Corporate office, Big 4 and Other mining facilities

Participating Corporate Office, Big 4 and Other mining facilities' management perceptions of risk culture were compared with each other in terms of significant differences. The three corresponding response averages of the UARM RCS-2018 survey items were calculated for Factors 1 and 2 and then compared. It was necessary to determine if the 6 distributions calculated in this manner followed a normal distribution, on the basis of descriptive statistics, to determine whether to use a parametric or non-parametric method of comparison. Since the parametric assumption of normality did not hold, a non-parametric method was used to test for significant differences in factor means between Corporate Office, Big 4 and Other mining facilities. Factor-based Wilcoxon scores were calculated for the three groups, which were then used to calculate the Kruskal-Wallis test and obtain results per factor at a 5% probability level. These results were used to verify whether there were significant differences between Corporate Office, Big 4 and Other facilities per factor. Because there were indeed differences for Factor 1 further analysis was needed to identify which of the three possible combinations of Corporate Office, Big 4 and Other mining facilities were significantly different. The Wilcoxon rank sum test was reapplied to the three combinations of the three management groups to identify which combinations had significant differences per item and factor at a 5% probability level.

4.4.4 Diagnostic items and 'I don't know' or 'I do not understand the statement' analysis

The results of the three diagnostic and the 42 'I don't know' or 'I do not understand the statement' responses were presented graphically and in tables. The information presented in this way was interpreted, and conclusions were drawn.

4.5 Benefits and limitations of data collection

The web-based approach selected for data collection facilitated data integrity, provided a secure platform and contributed to participant convenience (Collis & Hussey, 2013, p. 216). Respondents who completed the survey were dependent on their own interpretation of questions and rating scales and could have misinterpreted the intended meaning (Smith Jr, Wakely, De Kruif, & Swartz, 2003). The decision to use a Likert type scale to interpret participant responses had benefits and pitfalls (Allen & Seaman, 2007; Collis & Hussey, 2013, pp. 215-216; Jamieson, 2004). A detailed listing of the items contained in the UARM RCS-2018 is not provided, as they form part of a study submitted for publication elsewhere, but can be obtained from the authors of Appendix B.

4.6 Research ethics

The necessary approval to conduct the study was obtained from the mining company's executive team. The participants were assured of their anonymity and were informed that the organisation's name would not be identified in this report (Qu & Dumay, 2011). The survey introductory page is presented in Appendix D.

The study adhered to the North-West University's ethical requirements. Approval was obtained from the university's Ethics committee to use the UARM RCS-2018 (Ethics number ECONIT-2018-015) and the faculty's ethical checklist was completed and submitted in compliance with requirements.

5. Results and Discussion

5.1 Participant analysis

The results database recorded 329 instances of top and senior managers who participated in the survey. Of these, 73 cases were only partially completed and had to be discarded. The survey was therefore fully completed by 256 top and senior managers out of a combined population of 638 employees, representing a response rate of 40%. Of the 256 managers, 31 top and 225 senior managers participated in the survey, representing response rates of 35% and 41%, respectively. The response rates for the company's corporate office and production facilities are listed in Table 3. These are mostly acceptable response rates, as they come close to or exceed the 35.7% response threshold suggested for representative surveying in organisations (Baruch & Holtom, 2008).

Table 3: Survey response rates for the different mine facilities

Company facility	Number of participants	Size of population (January 2018)	Percentage response rate
Corporate office	106	268	40
Mine 1	54	166	33
Mine 2	34	90	38
Mine 3	20	39	51
Mine 4	14	18	78
Big 4	122	313	39
Mine 5	9	18	50
Mine 6	8	18	44
Mine 7	7	10	70
Plant 1	3	8	38
Mine 8	1	1	100
Mine 9	0	2	0
Other	28	57	49
Total	256	638	40

The demographic analysis provided some evidence of an enviable workplace setting at senior management level, with 85% of participating staff being employed for more than 5 years, 79% having a university qualification, of whom 46% were at postgraduate level. These numbers support various public media reports about the company receiving national awards related to overall employment satisfaction. As expected for a multi-cultural nation, only 20% of top and senior management speak English as their first language, although most South Africans are at least bilingual. Only 29% of top and senior management roles are occupied by women. More statistics on the demographics of the survey population are available in Appendix A. It is not expected that the demographic profile of respondents raised major concerns for the study outcomes.

5.2 Risk culture assessment

The first objective of this study was to assess the risk culture of: the company, top and senior management level employees, and of Corporate Office, Big 4 and Other mining facilities. Table 4 lists the factor-based risk culture maturity scores calculated for the company and participant groups, including the risk culture maturity level interpretations according to Table 2.

Table 4: Risk culture maturity scores per factor for different participant groups

Participant groups	Number of participants	Average factor scores and associated risk culture maturity levels			
		Factor 1 (24 items)	Maturity level	Factor 2 (18 items)	Maturity level
All participants	256	3.8	High level of perceived integration for all participant groupings (Interpreted according to Table 2)	3.9	High level of comfort for all participant groupings (Interpreted according to Table 2)
Senior	225	3.7		3.9	
Top	30*	4.1		4.3	
Corporate office	105*	3.6		3.8	
Big 4	122	3.8		4.0	
Other	30	3.8		4.0	

* One top management participant was excluded from all factor scale analysis for selecting 'I don't know' as a response to more than 70% of all items. See appendix B for more information.

Measurement outcomes indicated that on average all participants, and selected groups of respondents, perceived a high level of integration of risk in company decision-making processes, and that participants felt comfortable with their respective risk management roles. Considering that the survey achieved mostly (top management met Baruch & Holtom's criteria to be regarded as a representative survey in an organisation by 98%) representative participant response rates, it is likely that all the company's top and senior managers would have similar perceptions.

Moreover, there was no evidence that generous spending on support services at larger facilities (Big 4) translated into their having more mature risk cultures, in contrast to belief to the contrary widely held in the company. Indeed, the Big 4 and Other mining facilities had identical perceived risk cultures.

5.3 Comparative risk culture assessments

The second objective of this study was to determine if management's perception of risk culture differed significantly between top and senior management levels, and Corporate Office, Big 4 and Other mining facilities. The two risk culture comparisons are discussed separately in the following two sections.

5.3.1 Risk culture comparison between top and senior management

Descriptive statistics for top and senior management distributions of average UARM RCS-2018 survey item responses per factor are listed in Table 5. All listed distributions were left-skewed.

Table 5: Descriptive statistics per factor for top and senior management distributions

Level of management	Number of participants	Minimum	Median	Maximum	Mean	Std Dev	Mode
Factor 1							
Senior management	225	1.7	3.8	5.0	3.7	0.7	3.9
Top management	30	2.9	4.1	5.0	4.1	0.5	4.1
Factor 2							
Senior management	225	1.2	4.0	5.0	3.9	0.7	4.1
Top management	31	3.4	4.3	5.0	4.3	0.4	4.2

Since the parametric assumption of normality could not be verified, a non-parametric method was used to test for factor-based significant differences between top and senior management. The Wilcoxon scores were used to obtain the Wilcoxon rank sum (Mann-Whitney) test results as summarised in Table 6.

Table 6: Wilcoxon rank sum test results per factor for top and senior management

Risk-culture-related factors	Management level	Number of participants	Wilcoxon mean score	Chi-squared test statistic	p-value	Significant difference at $\alpha = 0.05$
Factor 1: Perceived level of integration of risk in decision-making processes	Senior	225	123	8.520	0.004	Yes
	Top	30	165			
Factor 2: Comfort with own risk management role	Senior	225	122	14.233	0.000	Yes
	Top	31	176			

This analysis indicated that there were significant risk culture maturity differences for both factors between top and senior managers. There were significant differences for 15 of the 24 items in Factor 1, and for 15 of the 18 items in Factor 2, at a 5% probability level. In both cases top management's scores were higher than those of senior management.

5.3.2 Risk culture comparison between Corporate Office, Big 4 and Other mining facilities

Descriptive statistics per factor for Corporate Office, Big 4 and Other mining facilities, related to the average of associated UARM RCS-2018 survey item responses, are listed in Table 7. All listed distributions were left-skewed.

Table 7: Factor based descriptive statistics for Corporate Office, Big 4 and Other mining facility distributions

Predefined groups	Number of participants	Minimum	Median	Maximum	Mean	Std Dev	Mode
Factor 1							
Corporate Office	105	1.9	3.6	5.0	3.6	0.7	3.0
Big 4	122	1.7	3.9	5.0	3.8	0.7	3.9
Other	28	1.7	4.0	4.8	3.8	0.8	4.3
Factor 2							
Corporate Office	106	1.7	3.9	5.0	3.8	0.7	5.0
Big 4	122	1.2	4.1	5.0	4.0	0.7	4.1
Other	28	2.9	4.1	5.0	4.0	0.6	3.7

Since none of the distributions complied with the parametric assumption of normality, a non-parametric method was used to test for factor-based significant differences between all predefined groups. The Wilcoxon scores were used to obtain the Kruskal-Wallis test results as summarised in Table 8. The test indicated significant differences between all the predefined groups for Factor 1.

Table 8: Kruskal-Wallis test results for Corporate Office, Big 4 and Other mining facilities per factor

Risk-culture-related factors	Groups	Number of participants	Wilcoxon mean score	Chi-squared test statistic	p-value	Significant difference at $\alpha = 0.05$
Factor 1: Perceived level of integration of risk in decision-making processes	Corporate Office	105	112	8.332	0.016	Yes
	Big 4	122	138			
	Other	28	145			
Factor 2: Comfort with own risk management role	Corporate Office	105	116	4.809	0.090	No
	Big 4	122	137			
	Other	28	138			

Although there were differences for Factor 1, further analysis was needed to identify which of the predefined groups differed from each other. The Kruskal-Wallis test was reapplied to the three combinations of Corporate Office, Big 4 and Other mining facilities, with the results presented in Table 9.

Table 9: Kruskal-Wallis results used for comparing each combination of the predefined company groups for Factor 1

Company groups	Number of participants	Wilcoxon mean score	Chi-squared test statistic	p-value	Significant difference at $\alpha = 0.05$
Corporate Office	105	102	6.760	0.009	Yes
Big 4	122	125			
Corporate Office	105	63	4.127	0.042	Yes
Other	28	80			
Big 4	122	75	0.262	0.609	No
Other	28	79			

The outcome of the analysis indicated that there were significant differences between two of the three combinations of the predefined groups for Factor 1: perceived level of integration of risk in decision-making processes. The comparisons showed significant differences for 9 out of 24 items between Corporate Office and Big 4, and 3 out of 24 items between Corporate Office and Other mining facilities, at a 5% probability level. Differences between Corporate Office and Big 4 were greater than those between Corporate Office and Other mining facilities. In both cases Corporate Office had the lowest perceived risk culture.

5.4 Interpretation of items and suggestions for mitigation

The third objective of the study was to provide possible reasons why significant differences could have existed between management levels and across the different mining facilities, and to give suggestions how they might be mitigated. It is important to re-emphasise that the UARM RCS-2018 was designed with the main aim of providing outcomes for the two risk culture factors (Appendix B). The scale is therefore able to provide only indications of possible reasons for significant differences. The items that indicated significant perceived differences were analysed and possible reasons provided for their occurrence. The large number of items with significant differences did not highlight any dominating aspects of concern with regards to risk management, as can be expected from a company with a mature risk culture. The possible reasons for these differences were therefore grouped together into four risk-related categories and are discussed in section 5.4.1. Suggestions are provided for mitigating significant perceived differences in risk culture in section 5.4.2.

5.4.1 Possible reasons for statistically significant differences in perception between participant groupings

Lack of accountability for managing risk

Senior managers felt less certain about top management's expectation with regard to their responsibility in monitoring, reporting and responding to risk (Coluccia et al., 2017; FSB, 2014). There was uncertainty from both senior managers and some of the business groupings with regard to the company's ability to learn from past risk events. Senior management also felt less convinced

than top management about the willingness of managers to assume accountability for events (IIF, 2013; ISO, 2018; Sheedy & Griffin, 2017). Big 4 did not agree with Corporate Office that top management were consistent in resolving risk issues (FSB, 2014).

Dysfunctional risk communication

Top managers created a perception among senior managers that their concerns about risk management were not taken seriously (IMA, 2014b; Kasperson, 2014; Siegrist, 2014). Senior managers were less willing to raise future risk concerns with their direct reports (COSO, 2017; DNB, 2015). In line with these breakdowns in communication, senior managers also felt less comfortable that there were constructive discussions about risk before making business decisions (Barton & MacArthur, 2015; Sheedy et al., 2017).

Incomplete understanding of risk

Senior management were less confident about their overall understanding of risk than top management (FSB, 2014). They had doubts about their understanding of: (a) the basic meaning of risk, (b) the risk and appetite framework, and (c) how risk linked to their company objectives (Aven & Zio, 2014; Banks, 2012, p. 68; FSB, 2014; IMA, 2015; Sheedy & Griffin, 2017). Senior management felt less certain also how to apply risk principles when making decisions than top management. This view might have contributed to senior managers having the perception that risk training has not adequately prepared them to manage risk related to their roles.

Insufficient risk-informed decision-making

The risk management function's work was probably less appreciated by senior than top management. Senior managers felt uncertain about the risk management function's ability to facilitate management of risk, and were sceptical about their contribution to reaching companywide objectives (DNB, 2015; Palermo et al., 2017). Compared with top managers, senior managers also felt unsure how to manage risk as part of their role, did not understand their colleagues' risk-related needs, and as a result were uncertain if they were adequately resourced (in respect of people, processes, systems, and budget) to do so (De Jonghe et al., 2013; DNB, 2015; England. HM Treasury, 2004). Similarly, senior management were also less certain if the organisation managed risk within their appetite statement (Sheedy et al., 2017).

5.4.2 Suggestions for mitigating significant perceived differences in risk culture

Since there were 42 significant differences between management levels and predefined facility groupings, it was decided to suggest improvements in the format of audit questions. This allowed the risk management or auditing departments to perform audits and propose improvements related to the items that indicated significant differences. When these recommended improvements are then addressed by the department responsible, the significant differences in the various items would be mitigated.

It is tempting to think that the audit questions are only applicable to senior management and the Corporate Office as they had the lowest perceived risk culture as indicated in section 5.3. Nevertheless, there is not supporting evidence to make such an assumption because the questionnaire evaluated perceptions only. For example, the perception that 'senior management was less certain if the organisation managed risk within its appetite statement' can be a shortcoming of either top or senior management in the organisation. In this example top management might not be managing risk according to the appetite statement or senior management could not have all the information because it was not communicated through to them. It is therefore recommended that the audit questionnaire be applied to the entire company, since findings would be raised only in the areas where shortcomings exist anyway. Once such findings are addressed, it might be supposed that the overall significant item differences would be resolved across the company, creating improved risk culture overall.

To set up the audit questions, the statements of each survey item that demonstrated significant differences were analysed to identify the obvious criteria that could have been considered by participants when they rated the item. The different criteria were then used to develop likely questions that a respondent could ask him/herself when deciding on a rating. The academic literature and risk management standards were also considered during the development of questions, which were grouped into categories to allow auditors to perform audits in a more systematic manner. The audit questionnaire is available in Appendix E.

The audit questionnaire has the following shortcomings:

- Realistically, not all aspects that could have been considered by participants, were identified;
- questions might be biased or inappropriate as they relied on the authors' experience of risk management;
- questions were based on participant perceptions which might not reflect the actual state of company affairs;
- participant perceptions might not be representative of the overall management population; and
- questions were limited to the aspects covered by the items in the survey.

It is therefore suggested that the audit questions be used in conjunction with other initiatives to mitigate risk culture inconsistencies.

5.5 Diagnostic questions and the 'I don't know' assessment

Apart from the 42-item UARM RCS-2018 assessment, the survey also included three diagnostic type questions. One of the questions (DTI-1) forms part of the UARM RCS-2018 43-item suite; the two other questions (DTI-2 and DTI-3) were added to investigate company-specific risk management

issues. The results and discussions of these items follow in sections 5.5.1 to 5.5.3. The ‘I don’t know’ assessment is provided in section 5.5.4.

5.5.1 Priority aspects to best improve risk-informed decision making

The results of the participant outcome for DTI-1: ‘To improve the inclusion of risk in decision-making in the organisation, I believe that we must start with improving’ is presented in Table 10. The intention of this item was to: 1) confirm management participants’ priority regarding specific risk management aspects affecting risk-informed decision-making; and 2) offer possible explanations for the outcome of the suggested rankings.

Table 10: Suggested priority of risk management aspects that would best improve the inclusion of risk in company decision-making.

Rank priority (RP)	Risk management aspect to improve the inclusion of risk in decision making	Percentage
1	Accountability for including risk when making decisions	23
2	Effective communication and challenge on decision-related risks	14
3	Leadership: tone from the top about the active inclusion of risk when making decisions	12
4	Risk management framework (functions, systems, processes, data)	11
5	Structural incentives for including risk when making decisions (e.g. remuneration, succession planning and talent development)	11
6	Shared understanding of risk	10
7	Risk-related role clarity	8
8	Group dynamics: how risk is included in decision-making in different groups in the organisation	6
9	Quality of risk-related information	5

The distribution of percentages (Table 10) indicates that only RP 1 was ranked significantly higher than the others, with RP 2-6 and RP 7-9 having relatively similar and lower rankings. The more distributed rankings, as opposed to having a concentrated distribution, highlighted a few companywide dominating aspects and might be related to the company’s overall high factor-based risk culture maturity. This view was further supported by the higher weighting allocated to behavioural management aspects (RP 1, 2, 3) as opposed to more structural ones (RP 4, 6, 7, 9) associated with a newer implementation.

Structural incentives (RP 5) attracted a relatively low priority, when considering that the associated average item score for this aspect was only 3.4 out of 5. As the company currently does not have a formal risk-informed incentive scheme, management employees did not seem to value such an initiative highly. If the risk department wished to motivate the added value of such a system, they would have to sell such a proposition convincingly amongst management members.

The low ranking allocated to the quality of risk-related information (RP 9), probably indicates that employees are satisfied with the information available from a more recent, award-winning implementation of risk management software. The rating of item 2 was surprising, considering that

the associated average survey score for this item was a relatively high 4 out of 5, perhaps indicating that respondents in senior management were hesitant to publicly evaluate the level of communication and challenge between themselves and their superiors. More work is therefore needed to understand better the management's ranking of this item.

There were items in the survey that supported the focus demanded for item 1. These items related to: 1) the company's ability to link risks to objectives, 2) the risk department's role in achieving area-specific objectives, 3) the risk framework and training initiatives not providing enough information regarding the management of risks, 4) a shortage of resources to manage risks adequately, 5) risk management processes not being properly integrated into management processes, and 6) the organisation's ability to learn from past risk events. The listing of these items is intended to serve as topics for possible discussion points that can be used by risk practitioners and managers wanting to discuss or investigate further the outcome of Table 10.

5.5.2 Manager ownership of company risk

Risk culture definitions emphasize organisational risk ownership; for example, 'understanding about risk, shared by a group' and 'organisations propensity to take risks' (Bozeman & Kingsley, 1998, p. 111; IRM, 2012, p. 22). The importance of companywide risk ownership is also described by global financial regulatory institutions (BCBS, 2015, p. 20; FSB, 2014, p. 8). DTI-2 assessed participating managers' perception of risk ownership by asking, 'Who owns risk in the organisation?', with the results presented in Figure 1.

Figure 1: Outcome of perceived risk ownership selected by management participants



Figure 1 indicates that the risk management programme has come a long way, with a healthy 71% of all participants accepting risk ownership (FSB, 2014). In contrast, almost 3 out of 10 managers have not grasped the value of taking responsibility for risk related to their area's strategy and

objectives. Unfortunately, these management respondents could affect large parts of the organisation as they might influence their subordinates in having similar views (Anderson & West, 1998; Zohar, 2000). These results could provide useful information to strategic and risk leadership planning future strategies aimed at improving company risk ownership. Participants were also provided with the option to suggest 'other' risk owners, with the outcome listed in Table 11.

Table 11: Participant suggestions for 'other' owners

All [Company name] employees, managers and board
All the employees at different levels
Every employee
Everyone working in the organisation should own risk; it is pertinent to every job role
The decision-making team or, more accurately, the person whom they report to who is making the final decision
This may well depend on the level of risk; the accountability lies in different spheres, depending on the risk magnitude
The risk ownership role of the board is not all that clear on the project level

This option was exercised by 2% of the respondents, with more than half of the contributors wanting to extend risk ownership to 'all employees'. This could be an additional question category of non-ownership, but when considering the low current percentage support and the many options already provided, it is not suggested as a new category for future surveys.

5.5.3 Manager focus when considering risk

Managers should consider the impact of internal and external risk on the company's strategy as part of strategic decision-making (COSO, 2017, pp. 3-8; ISO, 2018, p. v). DTI-3 assessed: 'What type of risk were you considering when you evaluated [company's name] risk in the questionnaire?', with the results presented in Figure 2. The item was intended to confirm if managers were able to scan for risk beyond their primary area of responsibility, by verifying if they thought of a domain specific area of responsibility or 'any risk impacting the organisation's objectives'.

Figure 2: Outcome of perceived risk considered by management participants when completing the survey

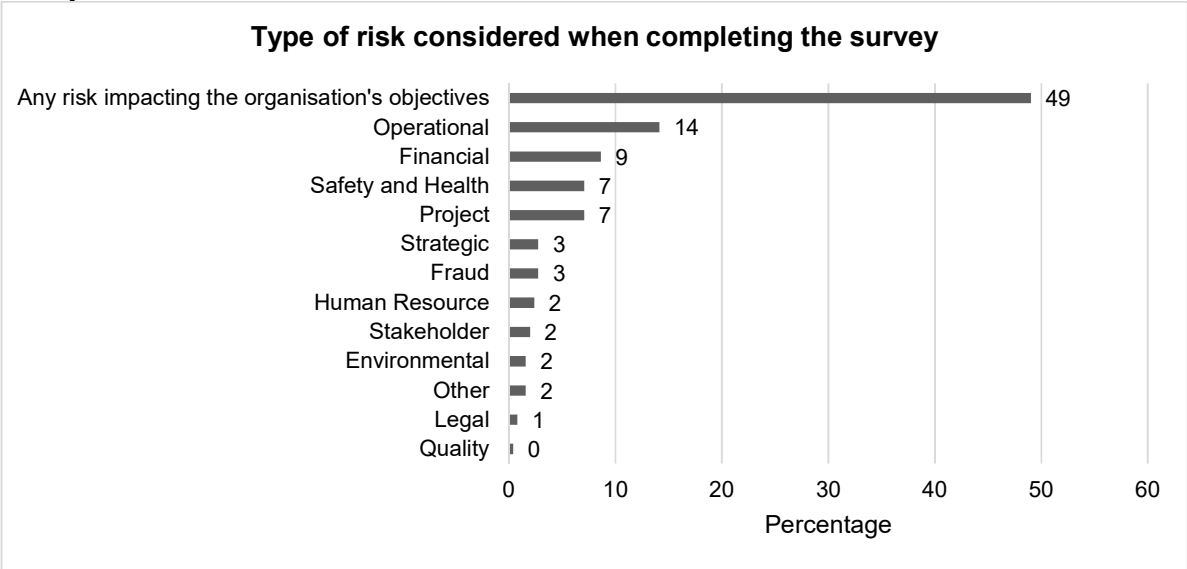


Figure 2 shows that respondents from management were almost perfectly divided in how they considered risk, with 49% having an external and 51% an internal focus. An inspection of the original data confirmed that all top management participants were able to consider risk beyond their primary field of responsibility. As top management represented 12% of the participant pool, 41% of senior managers considered risk beyond their primary area of responsibility, with the remaining 59% preferring a domain-specific focus. This basic assessment is useful, as it confirms the expected, that all top managers perceive themselves to have the ability to scan for any risk impacting objectives. Since top managers depend on senior managers to provide them with a balanced view of company-specific risks (scan domain specific area of responsibility), within the internal and external context of the organisation (scan beyond domain specific area of responsibility), the spread of focus of senior management would allow views on both perspectives. The analysis provided an overview of the company’s perceived ability to understand their internal and external risk context, which should comfort the company’s strategic and risk leadership (Hoyt & Liebenberg, 2011; ISO, 2018). However, further work is recommended to evaluate if strategic decision-making interventions are staffed appropriately to allow a balanced view of both perspectives. Table 12 list the ‘other’ risk categories raised by participants who did not feel comfortable with the options provided.

Table 12: ‘Other’ risks categories suggested by respondents

Losses linked to crimes, as well as safety and financial risks.
Major risks to achieving company's strategy or impacting licence to operate.
Mixture of project and strategic.
Community.

As only four 'Other' risk categories were suggested, it provided comfort that the options provided in the survey sufficiently represented the types of risks known to the organisation.

5.5.4 Analysis of 'I don't know' responses

The number of 'I don't know' or 'I do not understand the statement' responses were analysed for each of the 42 risk-culture-related items. Figure 3 lists the percentage of 'I don't know' responses for top and senior management per item.

Figure 3: Percentage of 'I don't know' responses selected per item for top and senior management participants

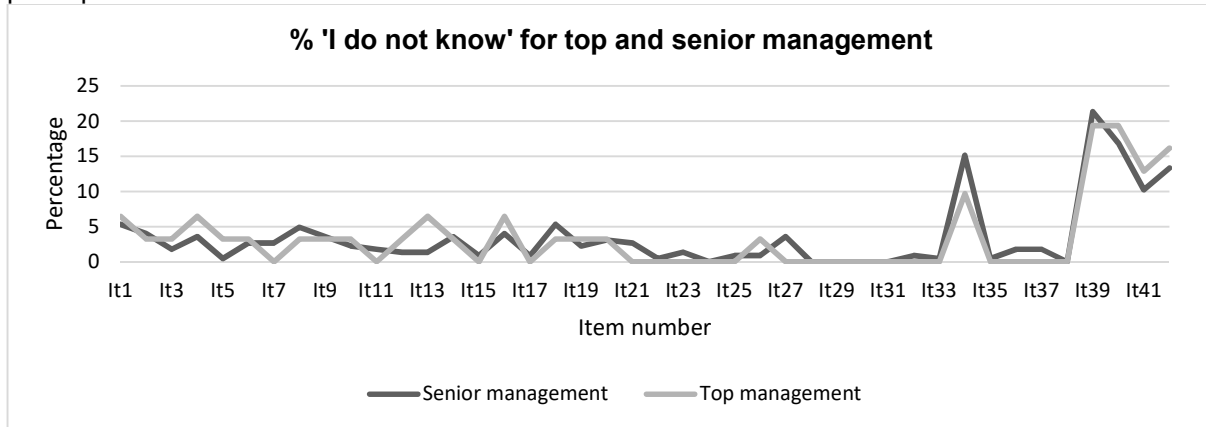


Figure 3 shows that items 34 and 39-41 attracted higher "I do not know" or "I do not understand" response rates, warranting further discussion. For item 34, the 'I don't know' response option was replaced with an 'I have not received formal risk management training in this organisation' option to collect more useable training information. The response therefore indicates the percentage of participants claiming not to have received formal company risk management training yet. These percentages are high (15% for senior and 10% for top management) considering that management should possess up-to-date knowledge of the company's risk management approach, to provide leadership and guidance to others. These training statistics should be useful to the risk department for cross-referencing with their own training statistics and to inform future training initiatives.

Items 34-39 assessed perceptions with regard to risk-informed performance management. The items attracted high responses as the company has not yet implemented a risk-informed performance management system, and possibly created uncertainty with participants. The management team would be advised to consider the benefits of implementing an appropriate risk-informed performance management system.

6. Conclusion

Results from the UARM RCS-2018 assessment confirmed that the management of the mining company studied perceived it to have a mature risk culture. This finding implies that the company is likely to have invested in risk management capability that enabled a risk management approach in support of integrated risk-informed decision-making. Because participating top and senior managers expressed comfort in managing their risk roles and confirmed integration of risk in decision-making processes, the company is probably able to apply risk management as a strategic enabler towards achieving strategies and objectives.

As could be expected from a mining company operating in a complex and widely distributed environment, management's perception of risk culture differed significantly, at a 5% probability level. Between top and senior management, 71% of the survey items indicated significant differences between the management levels, with top managers having a higher perception of the company's risk culture. Managers in the corporate office had the lowest perception of risk culture compared with two groups of mining facilities, with 29% of the survey items indicating significant differences between the groups.

The high number of items with significant differences did not indicate any dominating aspects of concern with regard to risk management, as can be expected from a company with a mature risk culture. However, it was possible to group the items into four risk-related categories that best explained the overall inconsistencies. These were, lack of accountability for managing risk, dysfunctional risk communication, incomplete understanding of risk, and insufficient risk-informed decision-making. Twenty-three percent of participating managers selected 'lack of accountability for managing risk' as a priority item to improve the inclusion of risk in decision-making.

To resolve risk culture inconsistencies practically, an audit questionnaire was developed for raising improvement findings to solicit proposals for improving the status quo. These would mitigate the inconsistencies once responsible departments implement the recommended suggestions. The two additional company-specific items included in the survey revealed that among participants, 72% accepted ownership for their risk management responsibilities, whereas all top and 36% of senior managers were able to consider risk beyond their primary field of responsibility.

Application of the UARM RCS-2018 has made it possible to measure risk culture maturity. However, the mining company in this study was less fascinated by the science of measuring risk culture and mostly interested in knowing how the results of the assessment would contribute to improving their risk management. There is a scarcity of academic literature describing the link between risk culture and risk management. It is unlikely that mining organisations would consider reporting on the status of their risk culture, unless the outcome thereof testifies to stakeholders about their ability to manage

risk. Researchers and practitioners therefore face an important challenge to expand on this introductory research further.

Number of words in abstract: 246

Number of words in article: 10 380

7. References

- Agrium. (2018). 2017 Annual Report. Retrieved from https://www.nornickel.com/upload/iblock/2ba/nn_cso2016_eng.pdf
- Allen, I. E., & Seaman, C. A. (2007). Likert Scales and Data Analyses. *statistics roundtable*, 40(7), 64-65.
- Anderson, N. R., & West, M. A. (1998). Measuring climate for work group innovation: development and validation of the team climate inventory. *Journal of Organisational Behavior*, 19(3), 235-258. doi:10.1002/(SICI)1099-1379(199805)19:3<235::AID-JOB837>3.0.CO;2-C
- Anglo American. (2017). Annual Report 2017. Retrieved from <http://www.angloamerican.com/~media/Files/A/Anglo-American-PLC-V2/documents/annual-updates-2018/aa-annual-report-2017.pdf>
- Ashley, S., & Green, K. P. (2018). Fraser Institute Annual Survey of Mining Companies 2017. Retrieved from <https://www.fraserinstitute.org/sites/default/files/survey-of-mining-companies-2017.pdf>
- Australia. Department of Resources, E. a. T. (2008). *Leading practice sustainable development program for the mining industry: Risk assessment and management*. Retrieved from <https://im4dc.org/wp-content/uploads/2014/01/Risk-assessment-and-management.pdf>.
- Australia. Prudential Regulation Authority. (2016). *Information Paper: Risk Culture Oct 2016*. Retrieved from <http://www.apra.gov.au/CrossIndustry/Documents/161018-Information-Paper-Risk-Culture.pdf>.
- Aven, T. (2012). The risk concept—historical and recent development trends. *Reliability Engineering & System Safety*, 99(Supplement C), 33-44. doi:10.1016/j.ress.2011.11.006
- Aven, T., & Zio, E. (2014). Foundational Issues in Risk Assessment and Risk Management. *Risk analysis*, 34(7), 1164-1172. doi:10.1111/risa.12132
- Banks, E. (2012). *Risk culture: A practical guide to building and strengthening the fabric of risk management*: Palgrave Macmillan.
- Barrick Gold. (2018). Annual Report 2017. Retrieved from https://barrick.q4cdn.com/788666289/files/doc_financials/annual/2017/Barrick-Annual-Report-2017.pdf
- Barton, T. L., & MacArthur, J. B. (2015). A need for a challenge culture in enterprise risk management. *Journal of Business & Accounting*, 8(1), 117-126.
- Baruch, Y., & Holtom, B. C. (2008). Survey response rate levels and trends in organizational research. *Human relations*, 61(8), 1139-1160. doi:10.1177/0018726708094863
- BCBS. (2015). Guidelines: Corporate Governance Principles for Banks. Retrieved from <http://www.bis.org/bcbs/publ/d328.pdf>

- Benning, I. (2000). Bankers' perspective of mining project finance. *The Journal of The South African Institute of Mining and Metallurgy*, 100(3), 145-152.
- BGR. (2017). BGR Energy Study 2017 – Data and Developments Concerning German and Global Energy Supplies. Retrieved from https://www.bgr.bund.de/EN/Themen/Energie/Downloads/energiestudie_2017_en.pdf?__blob=publicationFile&v=2
- BHP. (2017). Annual Report 2017. Retrieved from <https://www.bhp.com/-/media/documents/investors/annual-reports/2017/bhpannualreport2017.pdf>
- Bozeman, B., & Kingsley, G. (1998). Risk culture in public and private organizations. *Public Administration Review*, 58(2), 109-118. doi:10.2307/976358
- Brown, I., Steen, A., & Foreman, J. (2009). Risk Management in Corporate Governance: A Review and Proposal. *Corporate Governance: An International Review*, 17(5), 546-558. doi:10.1111/j.1467-8683.2009.00763.x
- Brūmelis, G., Brown, D. H., Nikodemus, O., & Tjarve, D. (1999). The Monitoring and Risk Assessment of Zn Deposition Around a Metal Smelter in Latvia. *Environmental Monitoring and Assessment*, 58(2), 201-212. doi:10.1023/a:1006085220366
- China Molybdenum. (2018). 2017 Annual Report. Retrieved from http://www.chinamoly.com/06invest/DOC/2018/E_03993_04207.pdf
- Choi, I. (2013). When do companies need a board-level risk management committee? Retrieved from <https://www.openknowledge.worldbank.org/handle/10986/17018>
- Collis, J., & Hussey, R. (2013). *Business research: A practical guide for undergraduate and postgraduate students*: Palgrave Macmillan.
- Coluccia, D., Fontana, S., Graziano, E. A., Rossi, M., & Solimene, S. (2017). Does risk culture affect banks' volatility? The case of the G-SIBs. *Corporate Ownership & Control*, 15(1), 33-43. doi:10.22495/cocv15i1art3
- COSO. (2009). Strengthening enterprise risk management for strategic advantage. Retrieved from https://www.coso.org/documents/COSO_09_board_position_final102309PRINTandWEBFINAL_000.pdf
- COSO. (2012). Enterprise risk management: Understanding and Communicating Risk Appetite. Retrieved from <https://www.coso.org/Documents/ERM-Understanding-and-Communicating-Risk-Appetite.pdf>
- COSO. (2015). Leveraging COSO across the three lines of defense. Retrieved from <https://www.coso.org/Documents/COSO-2015-3LOD.pdf>
- COSO. (2017). Enterprise Risk Management: Integrating with Strategy and Performance. Retrieved from <https://www.coso.org/Pages/ERM-Framework-Purchase.aspx>
- Davies, N., & Kijko, A. (2003). Seismic risk assessment : with an application to the South African insurance industry. *South African Actuarial Journal*, 3(1), 1-28.

- De Jonghe, F., Edelsten, M., & Xavier, I. (2013). The Cultural Revolution in Risk Management. *Journal of Financial Perspectives*, 1(1), 179-187.
- Dhanani, A. (2003). Foreign exchange risk management: a case in the mining industry. *The British Accounting Review*, 35(1), 35-63. doi:10.1016/S0890-8389(03)00002-7
- DNB. (2015). Supervision of behaviour and culture: foundations, practice & future developments. Retrieved from <https://www.dnb.nl/binaries/SupervisionofBehaviourandCultureetcm46-334417.pdf>
- Eggleston, W., & Ware, D. (2009). Does your board need a risk committee ? Retrieved from <https://www.debevoise.com/~media/files/insights/publications/2009/04/does%20your%20board%20need%20a%20risk%20committee/files/view%20article%20reprint/fileattachment/riskcommitteearticle.pdf>.
- England. HM Treasury. (2004). *The Orange Book: Management of Risk-Principles and Concepts*. Retrieved from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/220647/orange_book.pdf.
- EY. (2014). Shifting focus: Risk culture at the forefront of banking. Retrieved from https://www.iif.com/system/files/ey_shifting-focus-risk-culture-at-the-forefront-of-banking_1.pdf
- Franco-Nevada. (2018). 2017 Annual Report on form 40-F. Retrieved from https://s21.q4cdn.com/700333554/files/doc_downloads/key_doc/2018/fnv_Current_Folio_40F_with_Exhibits.pdf
- Freeport-McMoRan. (2018). Charter of the Audit Committee of the Board of Directors. Retrieved from https://www.fcx.com/sites/fcx/files/documents/corp_gov/audit_comm_charter.pdf
- Fresnillo. (2018). Annual Report and Accounts 2017. Retrieved from <http://www.fresnilloplc.com/media/367009/FRES-28347-AR2017-WEB.pdf>
- FSB. (2014). Guidance on supervisory interaction with financial institutions on risk culture: a framework for assessing risk culture. Retrieved from <http://www.fsb.org/2014/04/140407/>
- FSB. (2017). Stocktake of efforts to strengthen governance frameworks to mitigate misconduct risks. Retrieved from <http://www.fsb.org/wp-content/uploads/WGGFPhase-1-report-and-recommendations-for-Phase-2.pdf>
- Glencore. (2018). Annual Report 2017. Retrieved from <http://www.glencore.com/dam/jcr:d6c11311-5076-44b6-af40-dee29142d663/glen-2017-annual-report.pdf>
- Hindustan Zinc. (2017). Annual Report 2016 - 2017. Retrieved from http://www.hzindia.com/common/pdf/HZL_Final_Annual_Report_16-17.pdf
- Hofstede, G., Hofstede, G. J., & Minkov, M. (2010). *Cultures and Organizations, Software of the Mind, Intercultural Cooperation and its importance for survival*. USA: McGraw Hill.

- Holmes, R. (1981). Job Evaluation: Theory and Practice (Part 1). *Asia Pacific Journal of Human Resources*, 18(4), 42-49. doi:10.1177/103841118101800409
- Hoogervorst, J. (2017). The imperative for employee-centric organizing and its significance for enterprise engineering. *Organizational Design and Enterprise Engineering*, 1(1), 43-58. doi:10.1007/s41251-016-0003-y
- Hoyt, R. E., & Liebenberg, A. P. (2011). The Value of Enterprise Risk Management. *Journal of Risk and Insurance*, 78(4), 795-822. doi:10.1111/j.1539-6975.2011.01413.x
- ICMM. (2005). Financial assurance for mine closure and reclamation. Retrieved from <https://www.icmm.com/website/publications/pdfs/mine-closure/282.pdf>
- ICMM. (2015). Sustainable development framework: ICMM Principles. Retrieved from https://www.icmm.com/website/publications/pdfs/commitments/revised-2015_icmm-principles.pdf
- IIF. (2008). Final report of the IIF committee on market best practices: Principles of conduct and best practice recommendations. Retrieved from https://www.iif.com/system/files/iif_final_report_of_the_committee_on_market_best_practices.pdf
- IIF. (2009). Reform in the financial services industry: strengthening practices for a more stable system. The report of the IIF Steering Committee on Implementation (SCI). Retrieved from https://www.iif.com/system/files/iifreport_reformfinancialservicesindustry_1209.pdf
- IIF. (2013). IIF Issues paper: Promoting sound risk culture: Lessons learned, challenges remaining and areas for further consideration. Retrieved from <https://www.iif.com/news/regulatory-affairs/iif-releases-staff-note-promoting-sound-risk-culture>
- IISD. (2007). Corporate social responsibility: An implementation guide for business. Retrieved from http://www.iisd.org/pdf/2007/csr_guide.pdf
- IMA. (2014a). Enterprise risk management: Frameworks, elements, and integration. Retrieved from <https://www.imanet.org/insights-and-trends/risk--management/enterprise-risk-management?ssopc=1>
- IMA. (2014b). A risk challenge culture. Retrieved from <https://www.imanet.org/-/media/ea6321eb390b445ba4540f36e79ec280.ashx>
- IMA. (2015). Implementing an effective risk appetite. Retrieved from <https://www.imanet.org/-/media/8150b134bafd42aaaf5267bf49d6d2a3.ashx>
- IMA. (2016). Strategic risk management: Optimizing the risk-return profile. Retrieved from <https://imanet-live.ae-admin.com/insights-and-trends/risk--management/strategic-risk-management?ssopc=1>
- IODSA. (2016). King IV report on corporate governance for South Africa. Retrieved from <http://www.iodsa.co.za/page/KingIVReport>

- IRM. (2012). Risk culture: Resources for practitioners. Retrieved from <https://www.theirm.org/knowledge-and-resources/online-resource-centre/enterprise-risk-management.aspx#>
- ISO. (2018). 31000: 2018 Risk Management Guidelines. Retrieved from <https://www.iso.org/iso-31000-risk-management.html>
- Jamieson, S. (2004). Likert scales: how to (ab)use them. *Medical education*, 38(12), 1217-1218. doi:10.1111/j.1365-2929.2004.02012.x
- Joy, J. (2004). Occupational safety risk management in Australian mining. *Occupational Medicine*, 54(5), 311-315. doi:10.1093/occmed/kqh074
- Kasperson, R. (2014). Four questions for risk communication. *Journal of Risk research*, 17(10), 1233-1239. doi:10.1080/13669877.2014.900207
- Kennedy, B. A. (1990). *Surface Mining*. Littleton, United States: SME.
- Kimbrough, R. L., & Compton, P. J. (2009). The relationship between organizational culture and enterprise risk management. *Engineering Management Journal*, 21(2), 18-26. doi:10.1080/10429247.2009.11431803
- KPMG. (2011). Risk Management: A Driver of Enterprise Value in the Emerging Environment. Retrieved from <https://www.in.kpmg.com/SecureData/aci/Files/RiskManagementADriverofEnterpriseValueintheEmergingEnvironment.pdf>
- Lonmin. (2018). Annual Report and Accounts 2017. Retrieved from https://www.lonmin.com/reports/2017/online_annual_report_2017/pdfs/Lonmin_AR2017.pdf
- Lundberg, C. C. (1990). Surfacing Organisational Culture. *Journal of Managerial Psychology*, 5(4), 19-26. doi:10.1108/02683949010001520
- March, J. G., & Shapira, Z. (1987). Managerial Perspectives on Risk and Risk Taking. *Management science*, 33(11), 1404-1418.
- Merafe Resources. (2018). Integrated Annual Report 2017. Retrieved from http://www.meraferesources.co.za/reports/ir_2017/ebook/files/assets/common/downloads/publication.pdf
- Minerals Council South Africa. (2016). Mining in south africa: The challenges and the opportunities. Retrieved from <http://www.mineralscouncil.org.za/industry-news/publications/presentations/send/7-2015/269-mining-in-south-africa-the-challenges-and-opportunities>
- Minerals Council South Africa. (2017). Facts and figures 2016. Retrieved from <http://www.mineralscouncil.org.za/industry-news/publications/facts-and-figures/send/17-facts-and-figures/442-facts-and-figures-2016>
- Minerals Council South Africa. (2018). Mine SA 2017, Facts and Figures Pocketbook. Retrieved from <http://www.mineralscouncil.org.za/industry-news/publications/facts-and-figures>

- Newmont Mining. (2018). 2017 Annual Report and Form 10-K. Retrieved from [https://s1.q4cdn.com/259923520/files/doc_financials/annual/2017/2017-Newmont-Annual-Report-Web-Posting-Bookmarked-PDF-\(002\).pdf](https://s1.q4cdn.com/259923520/files/doc_financials/annual/2017/2017-Newmont-Annual-Report-Web-Posting-Bookmarked-PDF-(002).pdf)
- Norilsk Nickel. (2017). 2016 Corporate Social Responsibility Report. Retrieved from https://www.nornickel.com/upload/iblock/2ba/nn_cso2016_eng.pdf
- OECD. (2011). OECD Guidelines for Multinational Enterprises. Retrieved from <http://www.oecd.org/daf/inv/mne/48004323.pdf>
- Palermo, T., Power, M., & Ashby, S. (2017). Navigating Institutional Complexity: The Production of Risk Culture in the Financial Sector. *Journal of Management Studies*, 54(2), 154-181. doi:10.1111/joms.12241
- Power, M., Ashby, S., & Palermo, T. (2013). Risk culture in financial organisations: A research report. Retrieved from <http://www.lse.ac.uk/accounting/CARR/pdf/finalrisk-culture-report.pdf>
- Qu, S. Q., & Dumay, J. (2011). The qualitative research interview. *Qualitative research in accounting & management*, 8(3), 238-264. doi:10.1108/11766091111162070
- Richards, J. (2006). "Precious" metals: The case for treating metals as irreplaceable. *Journal of Cleaner Production*, 14(3), 324-333. doi:10.1016/j.jclepro.2004.05.005
- Ring, P. J., Bryce, C., McKinney, R., & Webb, R. (2016). Taking notice of risk culture – the regulator's approach. *Journal of Risk research*, 19(3), 364-387. doi:10.1080/13669877.2014.983944
- Rio Tinto. (2018). 2017 Annual Report. Retrieved from https://www.riotinto.com/documents/RT_2017_Annual_Report.pdf
- S&P Global. (2017). Top mining companies by market cap - Q3, 2017. Retrieved from <https://pages.marketintelligence.spglobal.com/top-mining-companies-by-market-cap-Q3-2017.html>
- Saudi Arabian Mining. (2018). Annual Report 2017. Retrieved from <https://www.maaden.com.sa/download/2017-Annual-Report-En.pdf>
- Schein, E. H. (2017). *Organisational culture and leadership* (fifth ed.): John Wiley & Sons.
- Sheedy, E. A., & Griffin, B. (2017). Risk governance, structures, culture, and behavior: A view from the inside. *Corporate Governance: An International Review*, 1-19. doi:10.1111/corg.12200
- Sheedy, E. A., Griffin, B., & Barbour, J. P. (2017). A Framework and Measure for Examining Risk Climate in Financial Institutions. *Journal of Business and Psychology*, 32(1), 101-116. doi:10.1007/s10869-015-9424-7
- Siegrist, M. (2014). More questions than answers: a response to 'Four questions for risk communication' by Roger Kasperson (2014). *Journal of Risk research*, 17(10), 1241-1243. doi:10.1080/13669877.2014.913668

- Simonsen, H., & Perry, J. (1999). Risk identification, assessment and management in the mining and metallurgical industries. *The Journal of The South African Institute of Mining and Metallurgy*, 99(6), 321-332.
- Sitkin, S. B., & Pablo, A. L. (1992). Reconceptualizing the Determinants of Risk Behavior. *The Academy of Management Review*, 17(1), 9-38. doi:10.2307/258646
- Smith Jr, E. V., Wakely, M. B., De Kruif, R. E., & Swartz, C. W. (2003). Optimizing rating scales for self-efficacy (and other) research. *Educational and psychological measurement*, 63(3), 369-391. doi:10.1177/0013164403251320
- South 32. (2018). 2017 Annual Report. Retrieved from https://www.south32.net/docs/default-source/all-financial-results/2017-annual-reporting-suite/2017-annual-report.pdf?sfvrsn=3e507e00_8
- South Africa. Davis Tax Committee. (2016). *Hard-rock mining*. Retrieved from <http://www.taxcom.org.za/docs/20171113%20Second%20and%20final%20hard-rock%20mining%20report%20on%20website.pdf>.
- South Africa. Statistics South Africa. (2017). Mining: a brief history. Retrieved from <http://www.statssa.gov.za/?p=9720>
- South Africa. Statistics South Africa. (2018a). Gross domestic product, Fourth quarter 2017. Retrieved from <http://www.statssa.gov.za/publications/P0441/P04414thQuarter2017.pdf>
- South Africa. Statistics South Africa. (2018b). Quarterly Labour Force Survey, Quarter 1: 2018. Retrieved from <http://www.statssa.gov.za/publications/P0211/P02111stQuarter2018.pdf>
- Spicer, A., Lindley, D., Gond, J., Mosonyi, S., Jaser, Z., Marti, E., . . . Edwards, A. (2016). Cultural change in the FCA, PRA & Bank of England. Practising what they preach? Retrieved from http://newcityagenda.co.uk/wp-content/uploads/2016/10/NCACultural-change-in-regulators-report_embargoed.pdf
- SSG. (2009). Risk Management Lessons from the Global Banking Crisis of 2008. Retrieved from <https://www.sec.gov/news/press/2009/report102109.pdf>
- Tufano, P. (1996). Who Manages Risk? An Empirical Examination of Risk Management Practices in the Gold Mining Industry. *The Journal of Finance*, 51(4), 1097-1137. doi:10.2307/2329389
- Tversky, A., & Fox, C. R. (1995). Weighing risk and uncertainty. *Psychological review*, 102(2), 269-283. doi:10.1037/0033-295X.102.2.269
- U.S. Geological Survey. (2018). *Mineral commodity summaries 2018*. Retrieved from <https://minerals.usgs.gov/minerals/pubs/mcs/2018/mcs2018.pdf>.
- Vale. (2018). 2017 Annual Report. Retrieved from <http://www.vale.com/indonesia/EN/investors/information-market-id/annual-reports/doc/PT%20Vale%20Indonesia%20Tbk%20Annual%20Report%202017.pdf>

Vedanta. (2018). Annual Report FY 2017. Retrieved from

http://ar2017.vedantaresources.com/vedanta_resources_ar_fy2017.pdf

Zohar, D. (2000). A group-level model of safety climate: Testing the effect of group climate on microaccidents in manufacturing jobs. *Journal of applied psychology*, 85(4), 587-596.
doi:10.1037/0021-9010.85.4.587

REFLECTION

My career has allowed me to attend executive and board committee meetings for almost ten consecutive years during which time I have made some thought-provoking observations. I sometimes witnessed how executives held back information impacting decision-making, how external auditors protected their territory by turning a blind eye towards unethical practices, how board members steered away from incriminating detail, and how the promises of profits blinded highly skilled individuals. As these observations resembled behaviours that fuelled the 2008 global financial crisis, I was determined to apply the UARM RCS-2018 as part of my master's leaning experience, wanting to gain better insight regarding organisational risk culture and improve my ability to assess better the value contributed by risk management. The concept of risk culture still creates a lot of confusion even among risk management experts and requires a lot of reading before grasping the concept. However, I do believe that employees in support departments can better integrate their services into their organisations by understanding the concept of organisational culture.

The study had an interesting start at the beginning of the new academic year, when unexpected career changes left me without access to a suitable organisation for conducting research. Suddenly, my research project had to be marketed to risk managers in search of a suitable organisation that was willing to host the risk culture assessment. The marketing of the project required an immediate conceptualisation of the various project stages with special focus on the practical organisational benefit that could be derived from applying the UARM RCS-2018. After finding a risk manager who was enthusiastic to host the project, a fair amount of time was required to conduct research about the new company and establish trusting relationships. Fortunately, the top-level risk manager at the company bought into the project and took full ownership for running the survey, which contributed significantly to achieving acceptable response rates.

When researching the topic of risk culture, I developed certain expectations regarding the outcome of the risk culture assessment which did not materialise. Although I was aware that the company studied received an advanced third-party maturity rating for their risk management implementation, the events of the global financial crises of 2008 influenced my thinking to expect a lower risk culture maturity rating. After conducting the survey and confirming a mature risk culture prevailed, my practical learning concerning risk culture came from understanding what the company did right, which was different from my initial expectation in that I thought my learning would come from analysing what they did wrong.

From the risk culture consistency assessment, I expected only a few significant item differences, which would have allowed for a more focused conclusion. When the opposite materialised, I started discussing each of the significant item differences separately and quickly ran into constraints concerning the wordcount I had available in following the mini-dissertation format. It also created a

very confusing 'Results and Discussion' chapter. In the end I decided to include only a grouped explanation for possible reasons for statistically significant differences in perception between participant groups. This grouped approach contributed to my idea of developing an audit questionnaire that contained all my suggestions for mitigating the significant differences. I initially wanted to include the questionnaire in the 'Results and Discussion' section but it created a 'Results and Discussion' chapter that was too long and that I thought would distract the reader and make him lose the storyline. The questionnaire was therefore moved to an Appendix. It was encouraging to receive very positive feedback concerning the practical value of the questionnaire, when reviewing the draft report with the risk manager at the company studied.

From a personal perspective, this master's programme provided a thorough overview of the latest risk management tools and techniques available in the market. The personnel from the UARM contributed significant value through their four-day theoretical training sessions on each of the risk management themes. The six assignments that had to be completed in the first year required extensive academic research to enable the solving of relevant industry-related problems that were structured around pertinent risk management themes. The practical application of the different topics covered in the programme was further emphasised through visits by respected industry experts that shared their risk-related experiences and facilitated interactive discussions that I found extremely valuable. Because of all the contact time in year one, I also valued the sharing of information between students coming from different industries and backgrounds and will most probably make use of this network for the rest of my working career. Lastly, I have great appreciation for the module on academic writing and the additional support provided to improve my writing skills.

APPENDICES

Appendix A: Demographic statistics of participants

	Number of participants	Percentage of participants
<u>Age Group</u>		
18 - 19 years	0	0
20 - 29 years	13	5
30 - 39 years	83	32
40 - 49 years	91	36
50 - 59 years	64	25
60 or older	5	2
<u>Gender</u>		
Male	183	71
Female	73	29
<u>English as first language</u>		
Yes	52	20
No	204	80
<u>Nationality</u>		
South African	254	99
Other *	2	1
* Both participants have Zimbabwean citizenship		
<u>Highest level of formal education completed</u>		
High school	7	3
College	33	13
University bachelor's degree	84	33
University post-graduate degree	115	45
Other*	17	7
* 1. Professional qualification (1), 2. National Diploma (7), 3. National Qualifications Framework (2), 4. Blasting ticket and Management Development Programme (1), 5. Trade Certificate (1), 6. Government Certificate of Competence (3), 7. Unknown (2).		
<u>Management level</u>		
Board	2	1
Executive	3	1
Top management (Patterson - E and F level roles)	26	10
Senior management (Patterson - D level roles)	225	88
<u>Role type (refers to employees' area of responsibility)</u>		
Risk	11	4
Finance	53	21
Coal Operations	84	33
Business Development	8	3
Human Resources	19	7
Project and Technology	48	19
Stakeholder Affairs	4	2
Sustainability	20	8
Group Company Secretary and Legal	3	1
Information Management (IM)	0	0
Supply Chain Management	6	2

	Number of participants	Percentage of participants
<u>Business units participating in the survey</u>		
Corporate Office	106	41
Mine 1	9	4
Mine 2	7	3
Mine 3	0	0
Mine 4	14	5
Mine 5	1	0
Plant 1	3	1
Mine 6	54	21
Mine 7	20	8
Mine 8	34	13
Mine 9	8	3
<u>Time employed at the organisation</u>		
Less than or equal to 1 year	13	5
More than 1 and less than or equal to 3 years	9	4
More than 3 and less than or equal to 5 years	14	5
More than 5 and less than or equal to 10 years	78	30
More than 10 years	142	55

Appendix B: UARM RCS-2018 overview

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).

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.

Risk-culture-related factors		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

hermien.zaaiman@nwu.ac.za

<http://commerce.nwu.ac.za/uarm>

References

BCBS. (2015). Guidelines: Corporate Governance Principles for Banks. Retrieved from
<http://www.bis.org/bcbs/publ/d328.pdf>

Appendix C: Invitation to participate in the risk culture survey

Dear [mining company's name] colleague,

With the aim of improving leadership decision-making our company has implemented a risk management programme based on a philosophy of entrenching risk management as a strategic business enabler rather than following a compliance driven approach. Academic research has shown that the ongoing success of organisational risk management is dependent on the existence of a mature company risk culture (E. A Sheedy & Griffin, 2017, p. 2).

Risk culture has been defined as the '***norms and traditions of behaviour of individuals and of groups within an organisation that determines the way in which they identify, understand, discuss and act on the risks the organisation confronts and the risks it takes***' (IIF, 2009, p. 31).

Our company's risk culture has not been assessed previously. Due to the strategic importance of risk management, we believe it is important to perform a risk culture assessment of top and senior management level employees across [mining company's name]. The aim of the assessment is to improve our understanding of the company's current risk culture maturity at top and senior management levels to support the development of future risk programs through replicating good practices and improving initiatives that need more focus. For the purposes of the assessment and simplicity sake top management has been defined as all employees on the Patterson E or F band and senior management as employees on the Patterson D band.

The assessment will be completed in collaboration with the North-West University Centre of Applied Risk Management as part of a master's degree study. The assessment has been approved and is supported by the EXCO team.

You are therefore invited to complete an assessment to evaluate [mining company's name] organisational risk culture by completing the 2018 version of the North-West University Centre of Applied Risk Management Risk Culture Scale.

The accuracy of the outcome of the assessment is highly dependent on the number of participants completing the questionnaire and for completeness sake I really want to urge you to participate and share your honest view of risk management practices across the organisation. The survey should take you less than 15 minutes to complete.

The questionnaire is available at: [https://www.research.net/r/\[mining company's name\]](https://www.research.net/r/[mining company's name])

The questionnaire will be open for your assessment of company risk culture from Monday 17 April 2018 to Monday 30 April 2018.

I am truly grateful for your willingness to participate in this study and contribute to our journey of functional excellence.

Kind regards,

[Top manager name]

General Manager Risk, Compliance and Assurance

References

Sheedy, E. A., & Griffin, B. (2017). Risk governance, structures, culture, and behavior: A view from the inside. *Corporate Governance: An International Review*, 1-19. doi:10.1111/corg.12200

Appendix D: Survey explanation and consent

Dear Participant

You are invited to participate in an academic research study conducted by the Centre for Applied Risk Management (UARM), North-West University Vaal Triangle Campus.

The goal of the study is to obtain an understanding of the perceived risk culture within [company name].

Note: The term 'the organisation' in this questionnaire refers to [company name]. Please answer all the questions with reference to [company name] in totality except where specified otherwise in the questionnaire.

Consent to conduct the research has been obtained from [company name] subject to the following conditions:

1. This is a confidential survey. You will not be identified and the answers you give will be treated as strictly confidential.
2. The organisation will not be identified in the research report.
3. The data will be analysed and only reported in aggregated format.
4. Anonymised general results of the study may be published in an academic journal subject to permission from the organisation

Note:

1. The survey consists of 9 biographical items followed by 45 risk-related items.
2. It should take you less than 15 minutes to complete the survey.
3. We would like to know what your experience of risk management in the organisation is. Please answer the questions as honestly as possible.
4. You must be at least 18 years old to participate in this survey.
5. Only complete the questionnaire once per application of the survey.

Questions about this survey can be directed to:

Jaco van Wyk at e-mail xxxxxxxx@xxxxxxx.com or telephonically at xxx xxx xxxx
or Prof. Hermien Zaaiman, Manager UARM at xxxxxxxxxxxx@nwu.ac.za

Appendix E: Audit questionnaire

Accountability for managing risk	
<i>Questions</i>	<i>References</i>
Verify if the ownership of: • strategic risks have been: ◦ allocated to executive managers, ◦ transferred from executive to top managers, ◦ transferred from top to senior managers, • risk controls have been allocated up to senior management level, • action plans designed to reduce risk within appetite levels have been allocated to top and senior managers. Confirm if adequate resources (people, processes, systems and budget) are available to enable the execution of risk responsibilities. Review the progress and changes to the risk registers for the area evaluated over the past six to twelve-month period. Confirm if: • action items remain consistent and are not continuously reworded or given new target dates without any medium- and long-term progress, • initial actions items are not watered down through continuous rewording and not resolving intended matters, • responsibility for unwanted or complex items are not shifted between managers or departments without any medium- and long-term progress, • responsibility for unwanted or complex items are not allocated to persons outside the area of responsibility preventing medium- and long-term progress, • senior managers can explain the essence of their responsibilities and how they plan to complete allocated actions in time and on budget (to confirm that the actions are not managed by the local risk representative), • detail management plans are available to verify timely progress against complex or capital-intensive action items, • top management consistently verify senior manager progress on action items, • top managers are holding senior managers responsible for internal audit findings raised against risk registers and tracking progress to rectify deficiencies, Review the minutes of area specific meetings where operational decision making happens. Confirm if: • top management resolves risk management issues raised in meetings especially those raised by senior managers, • top management explains their risk related decision-making, • senior managers debate important risk related issues appropriate to decision making discussions,	(Coluccia et al., 2017; COSO, 2015; FSB, 2014; IIF, 2013; IMA, 2015; ISO, 2018; Sheedy & Griffin, 2017)
Risk communication	
<i>Questions</i>	<i>References</i>
Study risk related messages issued and received in area reviewed. Verify if messages: • provide the necessary background, explain the issues, are directed at specific audiences, stipulate responsibilities, are timely and communicated to intended audiences, • align with the overall objectives of the risk management framework, • were discussed in the area, interpreted and actioned, • triggered the intended changes to systems, equipment, resources and people behaviour, • were realistic, had the proposed impact and produced the required results.	(Barton & MacArthur, 2015; COSO, 2012, 2017; DNB, 2015; Kaspersen, 2014; Sheedy & Griffin, 2017; Sheedy et al., 2017; Siegrist, 2014)
Risk management leadership	
<i>Questions</i>	<i>References</i>
External auditors review the company's executive meeting minutes and report findings against the requirements specified below at regular intervals as agreed at the risk committee. Management is encouraged to share key findings up to senior management level.	(COSO, 2009, 2017; IMA,

Verify if top management members: • approved the company's risk management framework by verifying its suitability for achieving company objectives and complying with legislation, • complied with approved risk management requirements and acted suitably against offenders, • investigated significant risk events and applied suggested corrective action, • held managers accountable to comply with risk management requirements and acted suitably against offenders.	2016; KPMG, 2011)
Risk understanding	
<i>Questions</i>	<i>References</i>
Verify if manager risk training programs: • are structured to distinguish between and meet the varying needs that might exist at business unit and management level, • prepare individuals to manage risks connected to their roles, • include practical exercises to demonstrate how training content are applied, • are supported by updated training plans maintained by all business units, • are executed and appropriate records maintained. Verify if manager risk training content: • teach risk management definitions and concepts in a language understandable at all levels, • provides oversight of the company's risk strategy, • explain the company's risk management and appetite framework (processes, practises etc.), • explain how risk management influences business decision-making, • explain how risk management relates to company strategies and objectives, • encourage and motivate advantages of respectful employee challenge regarding management risk-based decision-making, • prepare managers to handle management challenge in a manner that allows for improved decision-making, organisational learning and employee ownership, • provide appropriate training to explain and apply risk management processes, ◦ explain and give context of how risks are prioritised (rated) for management attention, ◦ encourage raising of risks related to strategies and objectives, ◦ explain how to uphold the integrity of current controls in a sustainable manner, ◦ describe how to plan and execute action items listed in risk registers needed to reduce risk exceeding company risk appetite, • explain event investigation and associated communication to encourage organisational learning. Verify if risk training initiatives include: • formal classroom learning, • review and discussion of learnings related to key loss events at all operational meetings, • short topical articles in company newsletters, increasing awareness of risk management, • five-minute discussions at the start of risk related business unit meetings to reinforce key risk aspects.	(Aven, 2012; Banks, 2012, pp. 166-171; Barton & MacArthur, 2015; COSO, 2017; FSB, 2014; ISO, 2018; Sheedy & Griffin, 2017)
Risk related role clarity	
<i>Questions</i>	<i>References</i>
Verify if senior manager's risk responsibilities are defined in applicable job descriptions and performance contracts. Confirm if managers understand their risk responsibilities and how it effects their daily jobs. Validate if senior manager risk performance is evaluated by top management.	(COSO, 2017; IRM, 2012; ISO, 2018)
Risk informed decision-making	
<i>Questions</i>	<i>References</i>
Verify if executive and top management risk appetite limits have been translated into appropriate limits at senior management level. Review business unit performance against appetite limits for the past twelve months and confirm if there were exceedances. Test if top and senior managers understand the company process when appetite limits are exceeded. Review the minutes of area specific meetings where operational decision-making happens. Confirm if appetite limits were considered as part of decision-making regarding high risk aspects. Verify if strategic high-level risk assessments at executive and top management level: • are traceable to detail risk assessments at senior management level per applicable business unit,	(Anderson & West, 1998; COSO, 2017; De Jonghe et al., 2013; DNB, 2015; England. HM Treasury, 2004; IMA, 2014b; IRM, 2012; Palermo et al., 2017;

-
- have appropriate controls and action plans,
 - mitigate organisational risks according to appetite statements.

Sheedy et al.,
2017)

Verify if the risk management function facilitates the management of company risks through:

- establishing policies, procedures and practices to allow systematic application of risk management processes,
- regularly participating in risk reviews,
- updating risk management processes at predetermined frequencies,
- reviewing critical company processes and evaluating their context in relation to strategic objectives and appetite statements,
- owning and consistently evaluating top company risks,
- assisting project teams to evaluate risks in accordance with strategic objectives and within appetite statements,
- sourcing external specialist assistance when required.

Verify if risk department representatives:

- have regular value adding face to face communication with all business units to promote the strategies and objectives of risk management,
- maintain a broad understanding of the company's internal and external risk context, to enable facilitation of appropriate risk discussions at all levels,
- anticipate the risk needs of departments and assist them in achieving their objectives by applying appropriate risk management techniques for example:
 - Look up methods,
 - Supporting methods,
 - Scenario analysis,
 - Functional analysis,
 - Controls assessment,
 - Statistical methods.

Review risk event investigations over the past twelve months. Evaluate the company's risk event investigation capability by:

- confirming if risk event recording was promoted across the company,
- validating employee knowledge of the risk event investigation system at all management levels,
- testing if employees are able to capture risk events,
- investigating the suitability of the event investigation prioritisation logic.

Verify if risk event:

- corrective action:
 - were implemented according to plans,
 - focussed on sustainable improvement,
- learnings and suggested improvements were:
 - communicated across the organisation,
 - considered and applied as appropriate across the company,
- approved changes to management systems were executed.

Verify if managers that partook in illegal practices related to risk events, were disciplined according to company policy.

Confirm if the risk and audit committee approved all significant risk event investigations.
