Risk understanding in the South African payments industry: A comparative analysis

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Classified

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PREFACE

This mini-dissertation is the final deliverable for the Master of Commerce (MCom) in Applied Risk Management. 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 to the study's conception and design, analysis and interpretation of data, and critical revision of the manuscript. The mini-dissertation was language edited before submission for examination. However, the student is responsible for doing these edits, and for the grammatical correctness of the document before hand-in.

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

ABSTRACT

Despite risk understanding being an important element of organisational risk culture, various aspects of risk understanding have yet to be explored. One such aspect is the extent to which organisations and regulators within the same industry share an understanding of the risk inherent in that industry. This qualitative study explored the differences and similarities in risk understanding between the statutory regulator of the South African National Payment System (NPS) and regulated entities within its ambit. Directed by a literature-based codebook, this study employed document analysis to assess policy documents issued by the regulator between 2016 and 2019 as well as risk documentation issued by regulated entities under the auspices of the industry's management body, for the same period. The results were then compared. Findings indicate that the nature of the risk, which includes the envisaged outcomes and their severity, the probability of occurrence of the risk, and the ease or difficulty of mitigating it are the main components for assessing an understanding of risk. Evaluation of policy and risk documents using these themes indicates that the regulator and regulated entities differ in their understanding of risks inherent in the NPS. Whereas the regulator is most concerned with negative consequences for the achievement of its policy objectives, resulting from systemic risk, regulated entities are primarily concerned with adverse consequences for their business operations. Neither the regulator nor the regulated entities consistently articulate the severity or probability of risks. Both the regulator and the regulated entities, however, regard regulation to be the most effective control with which to mitigate risks. This study offers a practical perspective to the regulator and regulated entities in the South African NPS on the extent to which they share an understanding of risk. For risk scholars, it provides a novel framework with which to assess risk understanding.

Key words: Risk understanding, South African National Payment System, Regulator, Comparative analysis, Risk culture

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CHAPTER 1: RESEARCH PROJECT OVERVIEW

Introduction to the study

Since the 2008 financial crisis, risk culture in financial sector organisations has become a key focus area for financial sector regulators (Ring et al., 2016; Sheedy et al., 2017). A prerequisite for an appropriate risk culture is, however, a shared understanding of risk (Fernández Muñiz et al., 2020; Roeschmann, 2014) among the different organisational actors involved. Although differences and similarities in risk understanding have been explored among different intra-organisational actors, the extent to which actors in different organisations share an understanding of risk remains largely unexplored. I became interested in inter-organisational understanding of risk after observing certain differences in opinion among members of the non-profit association I work for, and the regulator who oversees the activities of these entities. The objective of this qualitative study was therefore to contribute to current knowledge by further investigating the risk understanding indicator of the risk-informed decision culture (RiDC) approach advanced by Zaaiman et al. (2021). This research provides a novel model with which to assess risk understanding and illustrates the practical application of this model by identifying differences and similarities between the risk understanding of the South African National Payment System regulator and that of the entities it regulates. Additionally, this study provided me with an opportunity to learn how to conduct an applied research project and to demonstrate mastery of research at master's degree level within a research team context. The responsibilities of the different role players in this research project are described in Table 1.

Table 1: Role players in this study.

No	Team member	Role
1	Researcher (Marié Smit)	Conducted the research and wrote the mini-dissertation.
2	Supervisor (Dr Emmanuel Mulambya)	Advised the researcher on academic and writing aspects of the dissertation drafts.
3	Editor (Dr Graham Baker)	Advised during article writing workshops, and undertook a pre-final grammar-only edit of the dissertation.

The intended audiences for this article are risk researchers, risk practitioners in financial sector organisations, and financial sector regulators.

What to expect of this dissertation?

The project overview provided here is followed by a research article, which reports the findings of this study. This is followed by a section setting out my reflections on the research process as it was

conducted. The dissertation concludes with an appendices section, which serves to provide further detail on the research findings reported.

Selected journal

The publication selected for this article is the *Journal of Business Ethics*, which was chosen for its focus on diverse disciplinary and methodological perspectives on business ethics. Most notably, it has recently published articles on different conceptions of risk. The *Journal of Business Ethics* follows a double-blind reviewing procedure and is indexed in databases such as Scopus, Norwegian and IBSS. The journal's author guidelines may be accessed through the following link: https://www.springer.com/journal/10551/submission-guidelines.

Upon completion of the examination of this dissertation and receipt of the examiner's feedback, the suitability of this article for publication in the *Journal of Business Ethics* will be re-evaluated.

References

Fernández Muñiz, B., Montes Peón, J. M., & Vázquez Ordás, C. J. (2020, 2020/01/01). Misconduct and risk climate in banking: Development of a multidimensional measurement Scale. *Global Policy, 11*(S1), 73-83. https://doi.org/10.1111/1758-5899.12752

Ring, P. J., Bryce, C., McKinney, R., & Webb, R. (2016, 2016/03/15). Taking notice of risk culture – the regulator's approach. *Journal of Risk Research, 19*(3), 364-387. https://doi.org/10.1080/13669877.2014.983944

Roeschmann, A. Z. (2014, 2014/09/01). Risk culture: What it is and how it affects an insurer's risk management [https://doi.org/10.1111/rmir.12025]. *Risk Management and Insurance Review, 17*(2), 277-296. https://doi.org/https://doi.org/10.1111/rmir.12025

Sheedy, E. A., Griffin, B., & Barbour, J. P. (2017, 2017/02/01). A framework and measure for examining risk climate in financial institutions. *Journal of Business and Psychology, 32*(1), 101-116. https://doi.org/10.1007/s10869-015-9424-7

Zaaiman, H., Hofstede, G. J., Kocken, T. P., Van der Flier, H., & Born, M. P. (2021). Making sense of risk culture: A conceptual risk culture indicator framework [Manuscript in preparation].

CHAPTER 2: ARTICLE

Risk understanding in the South African payments industry: A comparative analysis

Abstract

Despite risk understanding being an important element of organisational risk culture, various aspects of risk understanding have yet to be explored. One such aspect is the extent to which organisations and regulators within the same industry share an understanding of the risk inherent in that industry. This qualitative study explored the differences and similarities in risk understanding between the statutory regulator of the South African National Payment System (NPS) and regulated entities within its ambit. Directed by a literature-based codebook, this study employed document analysis to assess policy documents issued by the regulator between 2016 and 2019 as well as risk documentation issued by regulated entities under the auspices of the industry's management body, for the same period. The results were then compared. Findings indicate that the nature of the risk, which includes the envisaged outcomes and their severity, the probability of occurrence of the risk, and the ease or difficulty of mitigating it are the main components for assessing an understanding of risk. Evaluation of policy and risk documents using these themes indicates that the regulator and regulated entities differ in their understanding of risks inherent in the NPS. Whereas the regulator is most concerned with negative consequences for the achievement of its policy objectives, resulting from systemic risk, regulated entities are primarily concerned with adverse consequences for their business operations. Neither the regulator nor the regulated entities consistently articulate the severity or probability of risks. Both the regulator and the regulated entities, however, regard regulation to be the most effective control with which to mitigate risks. This study offers a practical perspective to the regulator and regulated entities in the South African NPS on the extent to which they share an understanding of risk. For risk scholars, it provides a novel framework with which to assess risk understanding.

Key words: Risk understanding, South African National Payment System, Regulator, Comparative analysis, Risk culture

Table 2: Terms and acronyms used in this study

Term / Acronym	Description
3D Secure	The 3-factor authentication method used to confirm the identity of the payer during an e-commerce transaction
AC	Authenticated collections
ATM	Automated teller machine
BC	Business continuity
BCP	Business continuity policy
CLS	Continuous link settlement

Term / Acronym	Description
CNP	Card-not-present. This term is used to indicate transactions concluded using only the details on a card, and not requiring the presence of the physical card
CPMI	Committee on Payments Market Infrastructure
DR	Disaster recovery
EMV	Europay Mastercard Visa. Used to refer to the standards for processing card payments collectively set by these three schemes
FMI	Financial market infrastructure
NPS	National payment system
On-us transaction	A payment where payer and beneficiary bank with the same financial institution
PCH	A shared understanding of risk
PCI DSS	Payment card industry data security standards
PG	Participant group
POS	Point of sale
RTGS	Real-time gross settlement
SABRIC	South African Banking Risk Information Centre
SLA	Service level agreement
SO	System operator
Sort-at-source	The practice of bypassing the centralised payments infrastructure
TPPP	Third-party payments provider
ZAR	South African Rand

Introduction

Whereas the study of risk culture is still a nascent field of research (Sheedy et al., 2017), several studies indicate that a shared understanding of risk among different stakeholders is a core component of organisational risk culture (Agarwal & Kallapur, 2018; Fernández Muñiz et al., 2020). However, various aspects of risk understanding in the context of risk culture remain unexplored. Little is known, for example, about the factors that shape risk understanding, and how the milieu of different actors may influence such factors. This study aims to contribute to current knowledge in the context of these aspects.

To date, the risk culture literature has focused mainly on risk understanding as one of several indicators when assessing risk culture (Agarwal et al., 2019; Fernández Muñiz et al., 2020; Sheedy et al., 2017) and on identifying ways in which a shared risk understanding may be fostered within an organisation (Agarwal & Kallapur, 2018). In the financial sector, this has been done from an intra-organisational standpoint with apparently limited focus on the perspectives of regulators and other external stakeholders such as standard-setting organisations. Intra-organisational studies further

tend to focus on alignment of risk understanding between management and employees (Agarwal & Kallapur, 2018; Fernández Muñiz et al., 2020; Roeschmann, 2014; Sheedy et al., 2017) and do not explore whether management's understanding of risk aligns with that of the regulator. Furthermore, the current literature has focused almost exclusively on developed economies (Ring et al., 2016; Sheedy et al., 2017; Sinha & Arena, 2020). As a result, it is unknown whether financial organisations in the South African payments sector and the South African payment system regulator have a shared understanding of risk. Therefore, the research of this study was aimed at exploring risk understanding between the statutory regulator of the South African National Payment System (NPS) and regulated entities within its ambit. A greater understanding of how these different actors comprehend risk may contribute to enhanced alignment between them, which is ultimately necessary for achieving the desired risk culture within regulated entities in the South African NPS (Agarwal et al., 2019).

These gaps in current knowledge led to the research question: "How does the risk understanding of the South African payment system regulator compare to the risk understanding of regulated entities?" Correspondingly, the research objectives of this study were to compare risk understanding of the South African payment system regulator and risk understanding of regulated entities as reflected in their respective documented views on risk in the NPS.

To achieve the objective of the research, a qualitative study based on a literature review and document analysis was conducted. A thematic codebook based on the literature was used as a basis for the design of the study, and coding of the study results. In respect of the regulator, publicly available policy documentation issued between 2016 and 2019 was analysed, and in respect of regulated entities, permission was obtained to analyse risk documentation issued by the South African Payment System Management Body (PSMB) between 2016 and 2019. The PSMB is a statutory association and membership is compulsory for regulated entities in the NPS. The purpose of the PSMB is, amongst others, to serve as a forum for its members to engage with the regulator. Risk documentation issued by the PSMB accordingly reflects industry-wide views and is compiled by obtaining input from each individual regulated entity.

This study contributes to current theory on the role of risk understanding in shaping organisational risk culture by exploring risk understanding in a particular financial sector context from two different perspectives. To the researcher's knowledge, this study is the first to compare risk understanding between a regulator and regulated entities in the South African financial sector. Inter-organisational exploration of risk understanding would enhance current knowledge which, to date, has mainly focused on risk understanding from an intra-organisational perspective.

The remainder of this paper is devoted to an evaluation of the existing literature in the next section, followed by a description of the method employed in this research. Thereafter, a novel model of assessing risk understanding, together with recommendations for improving alignment in risk understanding between the regulator of the South African NPS and the entities it regulates, are presented and discussed. The paper concludes with recommendations for further study.

Background

Risk can be defined as "the potential negative effect of uncertainty on achieving objectives" (Heckmann et al., 2015; International Standards Organisation, 2018). Over the last four decades, risk management has become a prominent focus area in most organisations in general (Power, 2004, 2009), and in financial sector institutions in particular (Carretta et al., 2017). One of the main factors contributing to this trend is the increasing focus among financial sector regulators on organisational risk culture as a tool for preventing organisational failure (Agarwal & Kallapur, 2018; Carretta et al., 2017). However, a generally accepted definition of risk culture has yet to be established (Sinha & Arena, 2020). For this study, risk culture will be defined as the "perceived inclusion of risk in decision making", which ultimately indicates the extent to which an organisation values risk management (Zaaiman et al., 2021).

Building on their definition of risk culture, Zaaiman et al. (2021) point out that a shared understanding of how an organisation values and intends to manage risk is a prerequisite for ensuring that risk forms part of organisational decision making in an effective way. Shared risk understanding is therefore a risk culture indicator according to the risk-informed decision culture (RiDC) approach developed by Zaaiman et al. This approach incorporates a dynamic and interlinked view of ten risk culture indicators. Table 3 provides a list of these, in alphabetical order, and shows shared risk understanding as one of the behaviour-based indicators of risk culture according to this coherent model of risk culture.

Table 3: Risk culture indicators

No.	Risk culture indicator
1	Decision dynamics
2	Quality of risk-related information
3	Risk accountability
4	Risk-based incentives
5	Risk challenge
6	Risk communication
7	Risk leadership – tone
8	Risk management framework
9	Risk role clarity

No.	Risk culture indicator
10	Shared understanding of risk

Source: Zaaiman et al. (2021)

Although no universal definition of the term 'risk understanding' could be found in the risk culture literature, the term appears to be commonly used to indicate an acceptable appreciation of which uncertainties may lead to which negative effects, and how the organisation intends to manage both the uncertainties and their potentially adverse consequences (Weinstein, 1999). Table 4 summarizes the literature that supports the problem statement which led to this study.

Table 4: Summary of the literature on the role of risk understanding in risk culture

Article	Findings	Implications
Bozeman and Kingsley (1998)	• In exploring the differences between public and private sector organisations' risk culture, the authors identify that 'riskier' cultures are characterised by organisational leadership trusting that employees have an adequate understanding of risk, and not actively pursuing the establishment of an organisation-wide shared risk understanding. • The closer ties an organisation has with the regulator, the more risk-averse its culture tends to be.	• Suggests a nexus between a risk-averse culture and alignment with the regulatory understanding of risk. It does not, however, take cognisance of the influence of a specific context (e.g., a particular business unit) on the risk understanding of employees/actors in that context.
Roeschmann (2014)	• Identifies that risk understanding depends on the specific context within the organisation. • Management's ability to articulate its risk culture has a direct bearing on how risk management structures are understood and applied in an organisation.	• Does not explore possible external influences (such as the position of the regulator) on an organisation's risk understanding.
Ring et al. (2016)	• Measures organisational risk culture in terms of regulatory expectations of organisational behaviour. • Identifies the importance of regulatory guidance in fostering the desired understanding of risk, and consequently the desired risk culture.	• Views risk culture and risk understanding entirely from the regulator's perspective, and does not consider the regulated entity's understanding of, and perspective on, risk.
Sheedy et al. (2017)	• Identifies risk understanding as a key component in measuring organisational risk culture. • Identifies the role of organisational leadership in promoting risk understanding within the organisation.	• Findings contained to intra-organisational risk understanding.

Article	Findings	Implications
Agarwal and Kallapur (2018)	• Advances the view that a cognitive risk culture, in which a focus is placed on establishing a thorough understanding of risk, is preferable to a compliance-based risk culture. • Identifies the role of an organisation's leadership in promoting risk understanding through communication.	• Focuses solely on the role of organisational leadership in establishing risk understanding and does not contemplate the role of external actors (such as regulators) in this process.
Agarwal et al. (2019)	• Explores organisational risk culture (of which risk understanding is a key component) from an external perspective, being print news media. • Identifies the importance of establishing risk understanding through education and training.	• Does not take into account the risk understanding which underpins the print media analysed.
Fernández Muñiz et al. (2020)	• Conceptualises risk culture at the hand of factors viewed by international standard-setting bodies and regulators to be indicators of risk. • Identifies a shared risk understanding to be core to the establishment of a risk culture. • Advances the view that organisational management plays a key role in fostering a shared risk understanding.	• Views risk culture and risk understanding entirely from the perspective of the regulator and external standard-setting bodies and does not take into account the understanding of the regulated entity. • Does not explore the role of entities external to the organisation in fostering a shared risk understanding.
Sinha and Arena (2020)	• Explores the difference in approach between regulators and those responsible for ensuring organisational adherence to regulation on the one hand, to the approach of those responsible for translating requirements into business practices on the other, when it comes to assessing risk culture. • Findings indicate that regulators and implementers prefer specific, tangible measurements of risk culture, whereas normalisers and consultants preferred to focus on education and training of staff w.r.t risk understanding to measure the organisation's risk culture.	• Whereas the research provides a valuable contribution in being the first to explore risk culture and risk understanding from the perspective of different sets of organisational stakeholders, it does not examine the seeming disparity in views among different sets of actors (those responsible for giving effect to regulation, for example, the compliance function vs those responsible for implementing risk culture requirements at business level, such as consultants) internal to the organisation.

Table 2 indicates that various aspects of risk understanding in the context of risk culture remain unexplored. As a key indicator of risk culture, enhanced knowledge of the extent to which there is a shared risk understanding between regulators and regulated entities could be of particular value. From a theoretical perspective, it serves to expand on the current literature, which has to date focused almost exclusively on risk understanding from an intra- rather than an inter-organisation perspective. For regulators, such an enhanced understanding could serve as a first step in identifying whether an organisation's risk culture is likely to result in the desired behavioural outcomes. By the same token, regulated organisations may equally find value in gauging whether the risk understanding which underpins their risk culture is likely to be acceptable to the regulator.

The South African payment services sector provides an opportunity to investigate risk understanding between the regulator and regulated entities. Financial services the world over tend to be subject to regulation (Power, 2004; Ring et al., 2016). Like most financial services sectors, the South African NPS is characterised by the presence of a statutory regulator (the Payments Association of South Africa, 2020a).

However, in addition to setting out the powers and duties of the statutory regulator, the South African National Payment System Act also mandates the existence of a Payment System Management Body (PSMB), which comprises regulated entities (National Payment System Act, 1998). Membership of the PSMB is mandatory for any entity that directly participates in the provision of payment services in South Africa. The purpose of the PSMB is, amongst others, to act as a forum for its members collectively to interact and consult with the statutory regulator.

This collective of regulated entities, coupled with the relative ease of access to the regulator, offers the unusual opportunity to compare risk understanding from the perspective of the regulator as well as of the regulated entities.

To facilitate such a comparison, a literature-based codebook (Table 7) was developed, which is provided in the results section. The three main themes identified in the codebook indicate the factors required to form an understanding of risk. Risk understanding may therefore be assessed and compared in terms of these themes. The methods used for this study are discussed in the next section.

Method

This qualitative study was based on a literature review and document analysis.

Literature-based codebook

Following a systematic approach (Cronin et al., 2008), I performed a comprehensive search of the literature using the key terms ‘risk understanding’ and ‘risk perception’. To narrow the search, these terms were also used in conjunction with the terms ‘measure’ or ‘measurement’ as the dual objective of the codebook was not only to serve as a starting point for thematic analysis of regulatory policy- and PSMB risk documents, but also to act as a measure with which to compare the themes identified in each set of documents. Databases searched include Google Scholar and the library site of North-West University. To ensure relevance to the study, articles dealing with risk understanding in a

medical context were excluded. Articles not published in indexed journals were likewise excluded in the interest of enhancing the integrity of the data included in the codebook.

Document analysis

Document analysis was selected as the most appropriate research instrument, as it holds several benefits that would be particularly advantageous in the context of this qualitative study. First, the study of documented views and positions (collectively referred to as policy documents) provides a cost-effective and easy method to analyse data in a smaller scale study (Cardno, 2018). Second, Bowen (2009) indicates that document analysis is an effective method to study context. Indeed, Cardno (2018) submits that document analysis is the most appropriate tool for analysing policy documents. Finally, document analysis also enhances ethical practice where documents are in the public domain and is a non-reactive research method (Bowen, 2009).

Policy documents available from the regulator and risk documentation issued by the PSMB were thematically analysed. The objective of the analysis was to identify, and then to compare, themes in the policy documents issued by the regulator and those in the risk documentation created by the PSMB, with the themes in the literature-based codebook.

Data sources and units of analysis

This study was conducted on two units of analysis. The first was the regulator of the South African National Payment System. Policy documents issued by the regulator on risk in the National Payment System are set out in oversight frameworks, oversight reports, directives, position papers, and notices. The second unit of analysis was regulated entities in the South African National Payment System, as represented through the PSMB. This study focused on PSMB board-level risk reports and minutes of board meetings where verbal status updates, instead of a written report, on risk in the NPS were given to the board (collectively referred to as PSMB risk documentation). Although the PSMB has several committees dedicated to the discussion of various aspects of risk and risk management in the NPS, minutes of these committees were excluded from the scope of this study, for two reasons. First, unlike officially issued risk policies, frameworks, and board-level risk reports, minutes of meetings are intended as a record of the discussion and are not considered the official position of the members of the PSMB concerning risk. Second, official committee risk views and positions are filtered to the PSMB board through board-level risk reports.

Data collection and study sample

All policy documents issued by the regulator are publicly available on the regulator's website. In the interest of preserving the anonymity on which the ethics clearance for this study is based, the regulator's website address is not disclosed here. This study focused on policy documents issued in the four years from 2016 to 2019. A search of the regulator's website revealed 8 policy documents

issued between 2016 and 2019, that formed the sample of policy documents analysed for this study, are set out in Table 5.

Table 5: Regulatory policy documents included in the study sample

No.	Document title	Document type	Date issued
1	Annual Oversight Report 2015-2016	Oversight Report	2016
2	Notice on Payroll Deductions	Notice	2016
3	National Payment System Department Oversight Framework	Oversight Framework	2016
4	Annual Oversight Report 2016-2017	Oversight Report	2017
5	Notice to All Stakeholders in the National Payment System on Sort-at-Source	Notice	2017
6	First Amendment of Directive 1 of 2017 Collection of Payment Instructions for Authenticated Collections	Directive	2018
7	Position Paper no 1 of 2018 on the Principles for Financial Market Infrastructures	Position Paper	2018
8	Regulatory and Oversight Report 2019	Oversight Report	2019

PSMB risk documentation reflects industry-wide views and is compiled by obtaining input from each individual regulated entity.

Unlike policy documents, PSMB risk documentation is not in the public domain. Express permission was therefore obtained from the PSMB to source its risk documentation from the organisation's internal document repository. Twenty-one PSMB risk documents were issued between 2016 and 2019 and formed the sample of risk documents analysed for this study, as described in Table 6.

Table 6: PSMB risk documentation included in the study sample

No.	Document title	Document type	Date issued
1	PSMB Board Risk Report	Risk Report	February 2016
2	PSMB Board Risk Report	Risk Report	April 2016
3	PSMB Board Risk Report	Risk Report	July 2016
4	PSMB Board Risk Report	Risk Report	August 2016
5	PSMB Board Risk Report	Risk Report	October 2016
6	PSMB Board Risk Report	Risk Report	November 2016
7	PSMB Board Risk Report	Risk Report	February 2017
8	PSMB Board Risk Report	Risk Report	May 2017
9	PSMB Board Risk Report	Risk Report	July 2017
10	PSMB Board Risk Report	Risk Report	September 2017

11	PSMB Board Risk Report	Risk Report	November 2017
12	PSMB Board Risk Report	Risk Report	February 2018
13	Risk Committee Feedback to PSMB Board	Letter	March 2018
14	140th Meeting of the PSMB Board Minutes	Meeting Minutes	May 2018
15	142nd Meeting of the PSMB Board Minutes	Meeting Minutes	October 2018
16	PSMB Board Risk Report	Risk Report	August 2018
17	143rd Meeting of the PSMB Board Minutes	Meeting Minutes	November 2018
18	144th Meeting of the PSMB Board Minutes	Meeting Minutes	February 2019
19	PSMB Board Risk Report	Risk Report	May 2019
20	CRO Risk Management Report	Risk Report	July 2019
21	CRO Risk Management Report	Risk Report	September 2019
22	CRO Risk Management Report	Risk Report	November 2019

Data analysis

Following the steps suggested by Braun and Clarke (2006), a first read-through of documents was conducted, and initial sections pertaining to the study were highlighted and notes made. Next, documents and risk documentation were read systematically and coded against the literature-based codebook detailed in Table 7. Using Excel, codes, and sub-codes were recorded along with representative quotes. Themes identified in the two different samples were then compared to identify their differences and similarities, culminating in recommendations to improve alignment between the regulator and regulated entities.

Ethical considerations

Even though some of the documents analysed are available in the public domain, care was taken to safeguard the interests of all entities to which the documents refer. Where documents were not in the public domain, express permission was obtained to access and analyse such documents. In addition, I do not identify organisations or disclose organisational specifics in this research report. Table 6 lists all documents in the public sphere, which allows for checking of the research results.

All documents, whether in the public domain or organisation-specific, are stored in an access-controlled folder on the secure internal server of my employer, to which only I have access. Upon finalising the research and acceptance of this dissertation, all documents will be destroyed.

Results and Discussion

Literature-based codebook

Table 7: Literature-based risk understanding codebook

Code	Sub-code	Code description	Source
Nature of the risk		To have an understanding of a risk, sufficient knowledge of the potential negative effects that are envisaged to arise from the particular uncertainty is necessary.	Weinstein (1999), Aven (2010), Heckmann et al. (2015), Kaplan and Garrick (1981), Rundmo and Nordfjærn (2017), Wilson et al. (2019)
	Outcome	Knowledge of what outcomes can result from the materialisation of a risk is a prerequisite for comprehending the nature of the risk.	Weinstein (1999), Aven (2010), Heckmann et al. (2015), Kaplan and Garrick (1981).
	Severity	An understanding of the severity level of envisaged outcomes is necessary for full comprehension of the nature of the risk.	Weinstein (1999), Aven (2010), Heckmann et al. (2015), Kaplan and Garrick (1981), Rundmo and Nordfjærn (2017), Wilson et al. (2019).
Probability		To have an understanding of a risk, sufficient knowledge of the probability of the risk materialising is necessary.	Weinstein (1999), Aven (2010), Heckmann et al. (2015), Kaplan and Garrick (1981), Rundmo and Nordfjærn (2017), Wilson et al. (2019), Aven (2016).
Mitigation		Understanding of a risk necessitates sufficient knowledge of the controllability of the risk.	Weinstein (1999), Kaplan and Garrick (1981), Rundmo and Nordfjærn (2017) .

Table 7 provides the codebook derived from a review of the literature on risk understanding. The nature of the risk, the probability of the occurrence of a risk, and the ease or difficulty of mitigating the risk were identified as the three main criteria for assessing the understanding of a risk. The outcomes of a risk materialising, together with the severity of its consequences (risk outcomes) were identified as sub-codes that ultimately fed into the nature of the risk. A version of this codebook including example quotes from the literature is included in Appendix A.

Document analysis results based on documents from the regulator, and the PSMB, will be discussed next using themes in Table 7. Findings are presented with example quotes from the respective documents as evidence of risks, their outcomes, severity and probability ratings, and possible mitigation actions. A summary of findings per policy document and PSMB risk document reviewed is included in Appendices B and C, respectively. In this regard, it is important to mention that many industry-specific acronyms and terms were used in the documents assessed, and the reader's attention is accordingly directed to the list of terms and acronyms provided in Table 2 at the beginning of this article.

Nature of the risk

Table 8: Codebook on the comparative analysis of the nature of the risk: the regulator vs regulated entities

No.	Code	Code description	Typical risks from document analysis	
			The regulator	**Regulated entities**
1.	Nature of the risk	To understand risk, sufficient knowledge of the potential adverse effects that are envisaged to arise from the particular uncertainty is necessary.	Predominantly focused on systemic risk, which is the risk of a knock-on effect in case of participant failure, e.g. *"The main objective of oversight is the reduction of systemic risk, which could result from legal, liquidity, credit, operational, settlement and reputational risk in the payment system."*	Typical risks identified were: 1) Cyber security risk, which is the risk of unauthorised access or use of an entity's information and information systems resulting from cyber-attacks, e.g., *"…the risk that the NPS can become a victim of hacking, software malware attacks, data compromises etc.".* 2) Project risk, being the risk that industry projects timelines and objectives are not met, e.g., *"Project stakeholder readiness to start with industry testing on 1 November 2016 was identified as a potential threat. On 1 November 2016, several project stakeholders were not able to start testing, resulting in a significant impact on the planned project timelines. This will, in turn, affect the planned pilot start date of 1 July 2017*." 3) Debit order abuse, which is the risk of unauthorised deductions from customer accounts, exacerbated by participant non-adherence to the payment system rules, e.g., *"The above risk resides within the Electronic Funds Transfer and debit order payment streams. It mainly emanates from unauthorised Debit Orders passing through customer accounts due to non-adherence to Debit Order Clearing Rules, among other reasons."* 4) Operational risk, being the risk of unexpected losses and/or the risk due to participant error or crucial system breakdown, e.g., *"Operational Risk has been identified throughout the Payment Clearing Houses."* *5)* Fraud risk is the risk of deceptive behaviour with the aim of personal gain, resulting in financial loss for participants, e.g., *"Card-not-present fraud, including Fully-Authenticate-Fraud. This category of fraud, commonly executed via Internet Shopping, has by volume become the largest driver of gross fraud losses in card payments."* 6) Third-party risk is the risk posed to the NPS by new, non-traditional, market entrants who are not subject to the same regulation as incumbents, and who are accordingly not members of the PSMB, e.g., "*Third-party risks – payment system risks introduced through banks acting as sponsors for third-party vendors through SLAs where these parties are not as strictly regulated as banks and may introduce other third parties that increase the risk to the NPS while the banks generally have to bear the risk."* 7) Screen scraping, being the capturing of sensitive account holder information during online e-commerce payments, e.g., *"scraping of credentials and sensitive account holder information during e- commerce payments."*

Table 8 shows that the regulator's main risk focus appeared to be systemic risk. Chatterjee and Sing (2021) define systemic risk as "joint failures amongst a significant proportion of banks, and enough

to have real economy consequences." Risks identified by regulated entities, on the other hand, are numerous and varied. Seven distinct risks emerged from the risk documentation of regulated entities, namely, *cyber security risk, project risk, debit order abuse risk, operational risk, fraud risk, third-party risk, and screen scraping*. These risks were, however, seldom defined in the risk documentation. Whereas the outcomes envisaged from these risks indicate that general definitions of 'cyber security risk', 'project risk', 'fraud risk' and 'operational risk' apply, matters are less clear concerning 'debit order abuse risk', 'third-party risk' and 'screen scraping.' The concerns, which collectively appeared to give rise to documenting of 'debit order abuse risk', seemed to focus on unauthorised deductions from customer accounts through the various debit order payment systems, which practice was regarded as being exacerbated by participant non-adherence to the payment system rules designed to curb abuse. 'Third-party risk' appeared to denote concerns around the risk posed to the NPS by new, non-traditional, market entrants who are not subject to the same regulation as incumbents, and who are accordingly not members of the PSMB. Finally, the PSMB board risk report of July 2019 defines 'screen scraping' as "scraping of credentials and sensitive account holder information during e-commerce payments" and it appeared to be the possible negative consequences resulting from this practice with which the regulated entities were primarily concerned. These findings indicate that the regulator and regulated entities do not have the same view on the nature of key risks facing the South African NPS. The regulator's main concern is systemic risk, whereas regulated entities are primarily concerned with risks to their businesses resulting from specific operational activities. By articulating the nature of the risk, the regulator and regulated entities may ensure better alignment amongst all actors. A practical example is the expression of the systemic impact of sensitive account holder details being frequently exposed during e-commerce payments as a result of screen scraping.

Outcome

Table 9 shows that the regulator envisaged the outcome of systemic risk to impact regulatory policy objectives adversely. These objectives, as identified in the regulator's most recent strategy document, entitled *National Payment System Framework and Strategy–Vision 2025*, are the promotion of competition and innovation, financial inclusion, flexibility and adaptability, regional integration, transparency and public accountability, cost-effectiveness, financial stability and security, interoperability and a transparent regulatory and governance framework (South African Reserve Bank, 2018). In contrast, the negative consequences (or risk outcomes) which most concerned regulated entities were reputational damage, financial loss, fraud and data compromise.

Table 9: Codebook on the comparative analysis of the outcome of the risk: the regulator vs regulated entities

No.	Code	Code description	Typical outcomes from document analysis	
			The regulator	**Regulated entities**
2.	Outcome	Knowledge of what outcomes	Negative impact on regulatory policy	1) Cyber security risk is anticipated to result in data compromise, financial loss, fraud, and reputational damage,

	can result from the occurrence of a risk is a prerequisite for comprehending the nature of the risk.	objectives, e.g. *"The Sort-at-Source Notice addresses the practice of users bypassing the central clearing system and submitting files of transactions directly to the paying bank, which then processes such transactions as on-us transactions This practice negatively affects the integrity, efficiency, interoperability, transparency, effectiveness, and level of innovation in the NPS."*	e.g., "*Cyber risk means any risk of financial loss, disruption or damage to the reputation of an organisation from some sort of failure of its information technology systems…"* 2) Project risk is expected to result in non-achievement of project timelines and poor execution of projects, e.g., "*The duration remaining to successfully test the deferred functionality, mitigation actions and approved AC Project Steering Committee Scope changes with regression testing for the effective date of 15 September 2017, is under pressure."* 3) Debit order abuse risk is perceived as likely to cause legal risk, reputational impact, and adverse effects on consumers, e.g., "*Debit Order Abuse Risk- …mainly emanates from unauthorised Debit Orders passing through customer accounts due to non-adherence to Debit Order Clearing Rules, among other reasons. This risk may also lead to reputational risk for [the PSMB] and its Members."* 4) Operational risk is expected to cause clearing and settlement impact, e.g., *"increased occurrence of systems downtime either at Banks or PSOs, causing clearing and settlement risk…"* 5) Fraud risk is anticipated to result in reputational damage and financial loss, e.g., *"cards with altered EMV settings are used to commit contactless fraud on POS devices [resulting in] Risk of financial loss, reputation of card industry…"* 6) Third-party risk is perceived to bring about fraud and an unequal regulatory playing field*, e.g., "Payment System new market entrants: These provide additional channels for customers to access financial services. However, they introduce added complexity, increased value chain dynamics, are not adequately covered by the current regulatory landscape..."* *"The risk that new market entrants (disrupters) in the NPS will introduce fraud into the system but carry no liability for it."* 7) Screen scraping is viewed as leading to data compromise, fraud, counterparty risk and reputational impact, e.g., *"Screen scraping –. Risks include data privacy, fraud, and conduct, reputational and counterparty risks."*

As with the overarching nature of the risks, the regulator and regulated entities differ in their perspectives on risk outcomes. As could be inferred from the nature of the risks identified, regulated entities are concerned with adverse consequences for their business operations, and the regulator with adverse consequences for its objectives for the NPS as a whole. Expression of the relationship between negative consequences for the individual business operations of regulated entities and the achievement of regulatory policy objectives may assist in enhancing alignment between these industry players concerning risk outcomes.

Severity

Although the severity of risks appeared to be seldom expressed in the policy documents, the regulator does indicate that systemic risk is regarded as posing a 'serious' threat. In contrast, risks identified by regulated entities were, with the exception of screen scraping in respect of which severity is not expressed, accompanied by an indication of the perceived severity. The seriousness

of the seven risks is perceived as ranging from 'medium' to 'catastrophic'. Table 10 compares the findings concerning the severity of risks and details the severity rating in respect of each risk identified by regulated entities.

Table 10: Codebook on the comparative analysis of the severity of the risk: the regulator vs regulated entities

No.	Code	Code description based on the literature	Typical severity ratings from document analysis	
			The regulator	**Regulated entities**
3	Severity	An understanding of the severity level of envisaged outcomes is necessary for a full comprehension of the nature of the risk.	Serious, e.g., *"…may give rise to systemic risk and thus pose a serious threat to the entire payment system and possibly the wider economy*"	1) Cyber security risk was rated as high, e.g., "*Cybercrime and Security Risk: Risk Rating High*" 2) Project risk was rated as high or significant to catastrophic, e.g., *"Project Management Risk: Risk Rating High"* *"Authenticated Collections Project Risk Current Risk Rating Catastrophic."* 3) Debit order abuse risk was rated as medium, e.g., *"Debit Order Abuse Risk: Risk Rating Medium"* 4) Operational risk was rated as high to catastrophic, e.g., "*Operational Risk: High"* *"Operational Risk: Risk Rating Catastrophic."* 5) Fraud risk was rated as high or serious, e.g., *"There are concerns regarding Lost and Stolen Card Fraud (with a specific focus on ATM's) This can have serious reputational and financial implications for the NPS."* 6) Third-party risk was rated as medium, e.g., *"Extent of PSMB Mandate: Medium Risk"*

To articulate more easily the relationship between risks identified by regulated entities and systemic risk, a uniform risk-rating scale used by both regulator and regulated entities is recommended. By expressing the severity of a risk using a risk-rating scale with which all parties are familiar and agree on, those risks which may lead to systemic impact may be more easily identified in advance and more expeditiously managed.

Probability

Probability was the theme least frequently addressed by both the regulator and the regulated entities. The perceived likelihood of the anticipated adverse effects materialising was only discernible in two policy documents, the one indicating that the practice of sorting-at-source will adversely impact certain policy objectives and the other indicating that improper management of financial market infrastructures can lead to the realisation of systemic risk. Equally, just two PSMB risk documents articulated the likelihood of identified risks being realised. These two documents also address only six of the seven risks as far as the probability is concerned. In this regard, probability is perceived to range from 'almost certain' in the case of project risk to 'unlikely–moderate' in the case of third-party risk. The probability of occurrence of the risk related to screen scraping was not addressed in any of the documents reviewed. Table 11 provides a comparison of the findings on probability and details the perceived likelihood of each risk materialising.

Table 11: Codebook on the comparative analysis of the probability of risk materialising: the regulator vs regulated entities

No.	Code	Code description based on the literature	Typical probability ratings from document analysis	
			The regulator	**Regulated entities**
4.	Probability	To have an understanding of a risk, sufficient knowledge of the probability of the risk materialising is necessary.	1) Sort-at-source will be detrimental to policy objectives, e.g., *"If allowed, the sort-at-source practice will, inter alia, negatively impact the following public policy objectives and principles…"* 2) Systemic risk may result if financial market infrastructures are not properly managed, e.g., " *"… if FMIs are not properly managed, they can pose significant risks to the financial system by becoming potential sources of financial shocks and contagion ..."*	1) Cyber security risk was viewed as almost certain to occur, e.g., "*Cyber Crime Risk: Almost Certain.*" 2) Project risk was regarded as almost certain to materialise, e.g., "*AC Project Risk: Almost Certain"* *3)* Operational risk was seen as likely to almost certain, e.g., *"Operational Risk: Likely" "Card PCH: Likely–Almost Certain"* 4) Fraud risk was regarded as unlikely to having a moderate chance of occurring, e.g., "*Fraud Risk: Unlikely–Moderate*." 5) Third-party risk was seen as unlikely, to having a moderate probability of materialising, e.g., *"Extent of the PSMB Mandate: Unlikely–Moderate."*

As indicated by the literature-based codebook, the identification of the probability of a risk materialising is a core component of fully understanding such a risk. It is therefore recommended that both the regulator and the regulated entities adopt the practice of assigning a probability rating

to all risks identified. As with the severity of risks, the use of a uniform risk-rating scale to articulate probability could be beneficial in ensuring alignment between the regulator and regulated entities.

Mitigation

Table 12 shows that the regulator prefers issuing and adopting best–practice principles and guidelines, augmented by the issuing of directives and regulations including minimum requirements for participation in order to mitigate systemic risk. Equally, the adoption of standards and rules and compliance enforcement were identified by regulated entities as key mitigation measures in addressing risks identified. In addition, regulated entities viewed regulatory intervention or guidance as an important risk control. Only two non-regulatory risk management measures (being monitoring/management and education) were contemplated by the regulated entities as frequently as the adoption of regulation and regulatory intervention.

Table 12: Codebook on the comparative analysis of mitigation actions: the regulator vs regulated entities

No.	Code	Code description based on the literature	Typical mitigation actions from document analysis	
			The regulator	**Regulated entities**
5.`	Mitigation	Understanding of a risk necessitates sufficient knowledge of the controllability of the risk.	The regulator viewed the adoption of principles, best practices, the issuance of guidance and directives, and issuance of regulation and minimum requirements as the best mechanisms to mitigate systemic risk, e.g., *"Regulations for the retail payment systems (which are usually characterised by lower levels of systemic risk but have a critical bearing on public confidence in money) are useful in setting minimum reliability and efficiency requirements for service providers."*	Regulated entities held the following views around mitigation of the risks identified: 1) Cyber security risk can best be mitigated by the adoption of standards, compliance enforcement, regulatory guidance, centralised management, and education, e.g., *"Cybercrime and Security Risk: Although the implementation of risk reduction measures such as 3D secure and PCI are in place, more efforts are needed to ensure compliance enforcement of the above mitigation plans with industry merchants"* 2) Project Risk could best be mitigated by monitoring and management, revision of project implementation plans, regulatory intervention, and stakeholder communication, e.g., *"Project Risk: A revised test plan and schedule was agreed with project stakeholders to enable testing to meet the effective date of 15 September 2017. Additional controls such as daily monitoring of testing, incident management and weekly monitoring of Request for Clarification and Scope Change processes are in place."* 3) Debit order abuse risk can be mitigated by the implementation of the Authenticated Collections project, by imposing rules and enforcing compliance, and by enhancing management reporting, e.g., *"The new Compliance Enforcement Approach, Debit Order Abuse Rules process and the authenticated collections project are the primary risk reduction plans that will assist in reducing the residual risk impact of debit*

				order abuse."
No.	**Code**	**Code description based on the literature**	**Typical mitigation actions from document analysis**	
			The regulator	**Regulated entities**
				4) Operational risk should be mitigated by the implementation of business continuity and disaster recovery processes, compliance reporting, regulatory intervention, and increased industry training, e.g., *"Operational Risk Business Continuity Management with a specific reliance on the review of the Disaster Recovery Processes has been cited as an action plan for risk mitigation in the majority of the PCH PGs."* 5) Fraud risk could be mitigated by Cross-cutting regulation and enforcement, increased customer education, and awareness, adoption of industry-wide standards and best practices, as well as security monitoring. e.g., *"SABRIC customer awareness annually, Card scheme issuing and acquiring rules, PCI DSS standards and [PSMB] Compliance mandates."* 6) Third-party risk may be addressed by the imposition of minimum entry and participation criteria, regulatory intervention, and a review and improvement of the current regulatory model, e.g., *"Payments System new markets entrants- An industry approach is required to ensure new entrants form part of the formal regulatory landscape and that defined methodologies are flexible to enable the identification and management of the associated risks."* 7) Screen scraping controls include the adoption of application programme interfaces (APIs), customer education, regulation, and standardisation, e.g., *"Screen Scraping: A decision was taken to pursue option 2, to regulate and standardise the offerings by SOs and TPPPs"*

Although the risks with which the regulator and regulated entities are concerned differ, they identify the same mitigation actions most likely to address these risks. Regulated entities appear to believe that intervention by the regulator (either in the form of the introduction of new regulation or through direct engagement with entities involved in the activities perceived to be generating risk) is the most effective way of mitigating risks they face. In this light, alignment with the regulator on the understanding of risk would be valuable in ensuring that the relevant mitigating actions are implemented.

Conclusion

This study investigated how the risk understanding of the regulator of the South African NPS compared with the risk understanding of the regulated entities. The findings reported here indicate that the regulator and the regulated entities differ in their perspectives on risks to the NPS. Whereas

the regulator is most concerned with adverse consequences for the achievement of its policy objectives, regulated entities are primarily concerned with adverse consequences for their business operations. Neither the regulator nor regulated entities consistently articulate the severity of risks or the probability of risks materialising. Both the regulator and regulated entities, however, regard regulation (in the form of rules, guidelines, best-practice principles, and regulatory intervention) to be the most effective control with which to mitigate the risks. The differences in perspective on the nature and outcome of risks identified in this study were expected, given the differences in the nature and roles of the entities being compared. Equally, the lack of consistent assessment of severity and probability of risks was not unexpected on the part of the regulator due to the nature of policy documents. The lack of consistent severity and probability assessments on the part of the regulated entities as well as the similarities in preferred mitigation measures were, however, not anticipated. It was expected that the regulated entities, being financial service institutions, would be familiar with risk management and would therefore be cognisant of the need to assess the severity and probability of risks.

The findings of this study are subject to several limitations. First, in the case of the regulator, it is possible that more detail regarding the regulator's view on the risks articulated in policy documents analysed here are included in documents internal to the regulator, and therefore not reviewed as part of this study. Second, not all PSMB risk documents reviewed were of the same level of quality, with some documents dating back to 2018 not articulating any specific risk information, but rather focusing on risk governance structures. Finally, whilst every care was taken to ensure the credibility of the coding results, the presence of a second, independent coder in a qualitative study such as this would serve to further enhance the reliability of the coding results.

The findings of this study provide theoretical and practical insights on risk understanding within an industry. For the regulator and the regulated entities in the South African NPS, this study provides perspectives on their understanding of risks to the South African NPS as well as suggestions on how to improve alignment of risk understanding between the two actors. For risk scholars and risk practitioners, the study provides a framework or model for assessing risk understanding between different entities. In addition, this study supplies an approach for assessing inter-organisational risk understanding that can be replicated for any industry, and so provide a possible foundation for future studies.

References

Agarwal, A., Gupta, A., Kumar, A., & Tamilselvam, S. G. (2019, 2019/09/01/). Learning risk culture of banks using news analytics. *European Journal of Operational Research, 277*(2), 770-783. https://doi.org/https://doi.org/10.1016/j.ejor.2019.02.045

Agarwal, R., & Kallapur, S. (2018). Cognitive risk culture and advanced roles of actors in risk governance: A case study. *The Journal of Risk Finance, 19*(4), 327-342. https://doi.org/10.1108/JRF-11-2017-0189

Aven, T. (2010, 2010/06/01/). On how to define, understand and describe risk. *Reliability Engineering & System safety, 95*(6), 623-631. https://doi.org/https://doi.org/10.1016/j.ress.2010.01.011

Aven, T. (2016, 2016/08/16/). Risk assessment and risk management: Review of recent advances on their foundation. *European Journal of Operational Research, 253*(1), 1-13. https://doi.org/https://doi.org/10.1016/j.ejor.2015.12.023

Bowen, G. (2009, 08/03). Document analysis as a qualitative research method. *Qualitative Research Journal, 9*, 27-40. https://doi.org/10.3316/QRJ0902027

Bozeman, B., & Kingsley, G. (1998). Risk culture in public and private organizations. *Public Administration Review, 58*(2), 109-118. https://doi.org/10.2307/976358

Braun, V., & Clarke, V. (2006, 2006/01/01). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101. https://doi.org/10.1191/1478088706qp063oa

Cardno, C. (2018). Policy document analysis: A practical educational leadership tool and a qualitative research method. *Educational Administration: Theory and Practice, 24*(4), 623-640. http://www.journal.mai.ac.nz/sites/default/files/MAIJrnl_6_2_Cardno_02_Final.pdf

Carretta, A., Farina, V., & Schwizer, P. (2017). Risk culture and banking supervision. *Journal of Financial Regulation and Compliance, 25*(2), 209-226. https://doi.org/10.1108/JFRC-03-2016-0019

Chatterjee, S., & Sing, M. (2021). *Measuring Systemic Risk in South African Banks* (South African Reserve Bank Working Paper Series
WP/21/04, Issue.

Cronin, P., Ryan, F., & Coughlan, M. (2008). Undertaking a literature review: A step-by-step approach. *British Journal of Nursing, 17*(1), 38-43. https://nwulib.nwu.ac.za/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=c8h&AN=105971907&site=eds-live

Fernández Muñiz, B., Montes Peón, J. M., & Vázquez Ordás, C. J. (2020, 2020/01/01). Misconduct and risk climate in banking: Development of a multidimensional measurement scale. *Global Policy, 11*(S1), 73-83. https://doi.org/10.1111/1758-5899.12752

Heckmann, I., Comes, T., & Nickel, S. (2015, 2015/04/01/). A critical review on supply chain risk – definition, measure and modeling. *Omega, 52*, 119-132. https://doi.org/https://doi.org/10.1016/j.omega.2014.10.004

International Standards Organisation. (2018). ISO3100: Risk Management- Guidelines.

Kaplan, S., & Garrick, B. J. (1981, 1981/03/01). On the quantitative definition of risk [https://doi.org/10.1111/j.1539-6924.1981.tb01350.x]. *Risk Analysis, 1*(1), 11-27. https://doi.org/https://doi.org/10.1111/j.1539-6924.1981.tb01350.x

Koch, T., & Harrington, A. (1998). Reconceptualizing rigour: the case for reflexivity. *Journal of advanced nursing, 28 4*, 882-890.

Nadin, S., & Cassell, C. (2006). The use of a research diary as a tool for reflexive practice. *Qualitative Research in Accounting & Management, 3*(3), 208-217. https://doi.org/10.1108/11766090610705407

National Payment System Act (R.S.A), (1998).

Power, M. (2004). The risk management of everything. *The Journal of Risk Finance, 5*(3), 58-65. https://doi.org/10.1108/eb023001

Power, M. (2009, 2009/08/01/). The risk management of nothing. *Accounting, Organizations and Society, 34*(6), 849-855. https://doi.org/https://doi.org/10.1016/j.aos.2009.06.001

Ring, P. J., Bryce, C., McKinney, R., & Webb, R. (2016, 2016/03/15). Taking notice of risk culture – the regulator's approach. *Journal of Risk Research, 19*(3), 364-387. https://doi.org/10.1080/13669877.2014.983944

Roeschmann, A. Z. (2014, 2014/09/01). Risk culture: What it is and how it affects an insurer's risk management [https://doi.org/10.1111/rmir.12025]. *Risk Management and Insurance Review, 17*(2), 277-296. https://doi.org/https://doi.org/10.1111/rmir.12025

Rundmo, T., & Nordfjærn, T. (2017, 2017/03/01/). Does risk perception really exist? *Safety Science, 93*, 230-240. https://doi.org/https://doi.org/10.1016/j.ssci.2016.12.014

Sheedy, E. A., Griffin, B., & Barbour, J. P. (2017, 2017/02/01). A framework and measure for examining risk climate in financial institutions. *Journal of Business and Psychology, 32*(1), 101-116. https://doi.org/10.1007/s10869-015-9424-7

Sinha, V. K., & Arena, M. (2020, 2020/02/01). Manifold conceptions of the internal auditing of risk culture in the financial sector. *Journal of Business Ethics, 162*(1), 81-102. https://doi.org/10.1007/s10551-018-3969-0

South African Reserve Bank. (2018). The National Payment System Framework and Strategy: Vision 2025.

The Payments Association of South Africa. (2020a). *National Payment System: Overview*.

Weinstein, N. D. (1999). What does it mean to understand a risk? Evaluating risk comprehension. *JNCI Monographs, 1999*(25), 15-20. https://doi.org/10.1093/oxfordjournals.jncimonographs.a024192

Wilson, R. S., Zwickle, A., & Walpole, H. (2019, 2019/04/01). Developing a broadly applicable measure of risk perception [https://doi.org/10.1111/risa.13207]. *Risk Analysis, 39*(4), 777-791. https://doi.org/https://doi.org/10.1111/risa.13207

Zaaiman, H., Hofstede, G. J., Kocken, T. P., Van der Flier, H., & Born, M. P. (2021). Making sense of risk culture: A conceptual risk culture indicator framework [Manuscript in preparation].

Number of words:

Abstract: 300 words

Article: 7388

CHAPTER 3: REFLECTION

Although the findings of this study are limited by the exclusive focus on documented perspectives, it serves as a first step in exploring inter-organisational risk understanding. The literature-based codebook used in this research provides a novel framework to assess risk understanding for both scholarly research and practical purposes.

When I started my master's degree in 2020, it was with a great sense of how little I knew and no small amount of uncertainty as to whether I would be able to deliver this project in the timeframe required. Like my classmates, I was, however, soon to learn that we were extremely fortunate in the quality of the programme we had enrolled for and in the supervision we would receive. The support and guidance provided by Dr Mulambya, Professor Zaaiman and the rest of the UARM team throughout this journey were truly remarkable and played a key role in allowing the class of 2020 to complete their research during a very challenging period due to the COVID-19 pandemic.

Conducting this research was a challenge I thoroughly enjoyed. Every stage in the process brought with it a new opportunity to either expand my own knowledge or to endeavour to contribute to collective knowledge (more frequently the former!). Like any researcher, there were times when I experienced obstacles – such as ensuring that the research is framed in a way that enables readers from non-payments backgrounds to understand the study. However, even at these times I was always conscious of a keen passion for my chosen research topic and being privileged in the support of my close friends and family as well as my employer.

There is a growing call for reflexivity in research to reduce researcher bias (Koch & Harrington, 1998; Nadin & Cassell, 2006). Accordingly, Table 13 provides sample entries from the reflective journal employed in this study.

Table 13: Sample of reflective journal entries of this study

Date	Entry	Action
3 June 2021	At present, the study is intended to span documents issued in the last 5 years: i.e. 2016 up to and including 2020. The far-reaching consequences of the COVID-19 pandemic are likely to influence the results of the study. If 2020 is included, the impact of COVID-19 will have to be addressed as part of the findings. At present insufficient knowledge exists on either risk understanding in general or changes in risk behaviour as a result of COVID-19 to enable me to do this.	Reduced the scope of the study to 4 years: 2016 up to and including 2019, thus eliminating the effects of COVID-19 on the study.
3 June 2021	As a result of reducing the scope of the study, data gathered may be insufficient to adequately answer the research question.	Monitored data analysis with Dr Mulambya (my supervisor) to ascertain if scope must be increased to include years prior to 2016.

Date	Entry	Action
14 June 2021	The preliminary reading of literature indicates that risk understanding and risk perception might also be related to the way in which risk is assessed. Should the search for literature include the key term "risk assessment"?	Performed an initial search around "risk assessment" to ascertain whether this will add any value to the study.
24 July 2021	Terms in the codebooks may be unfamiliar to readers.	Included a list of terms and acronyms at the start of the article.
29 September 2021	Illustration of findings requires the inclusion of several different quotes in codebooks, which makes codebooks difficult to read.	Select one quote for inclusion in the codebook only and include more comprehensive views on findings and supporting quotes in the annexures.

For me, the findings emanating from the application of the codebook in this research were not only a confirmation of previous observations around differences in risk understanding among the NPS regulator and regulated entities but also a confirmation of the suitability of the codebook to assess risk understanding. I include a summary of the findings of this study and their possible value for the payments sector in Appendix D.

In conclusion, doing this mini-dissertation has not only taught me valuable research skills but has also inspired me to continue with my studies. I look forward to learning more about the topic of risk management. I hope that this study will contribute to future research in the field of risk.

References

Koch, T., & Harrington, A. (1998). Reconceptualizing rigour: the case for reflexivity. *Journal of Advanced Nursing, 28 4*, 882-890.

Nadin, S., & Cassell, C. (2006). The use of a research diary as a tool for reflexive practice. *Qualitative Research in Accounting & Management, 3*(3), 208-217. https://doi.org/10.1108/11766090610705407

APPENDICES

Appendix A

Literature-based codebook including example quotes from articles

Code	Sub-code	Meaning	Example quote	Source
Nature of the risk		To have an understanding of a risk, sufficient knowledge of the potential negative effects that are envisaged to arise from the particular uncertainty is necessary.	*" However, it is not possible to conceptualise and measure perceived risk in a direct reflective factor model, i.e. a model not specifying the risk source."*	Rundmo and Nordfjærn (2017)
	Outcome	Knowledge of what outcomes can result from the materialisation of a risk is a prerequisite for comprehending the nature of the risk.	*"...a risk analysis consists of an answer to the following three questions: (i) What can happen? (i.e., What can go wrong?)…."*	Kaplan and Garrick (1981)
	Severity	An understanding of the severity level of envisaged outcomes is necessary for full comprehension of the nature of the risk.	*"Our original conception of the items based on prior literature would require a three-factor model comprising ... (3) severity of the consequences of the hazard (consequence)."*	Wilson et al. (2019)
Probability		To have an understanding of a risk, sufficient knowledge of the probability of the risk materialising is necessary.	*"...the concept of risk comprises events (initiating events, scenarios), consequences (outcomes) and probabilities. Uncertainties are expressed through probabilities."*	Aven (2010)
Mitigation		Understanding of a risk necessitates sufficient knowledge of the controllability of the risk.	*"Thus one cannot talk about risk in isolation. One needs to adopt a decision theory point of view and ask: "What are my options, what are the costs, benefits, and risks of each?'"*	Kaplan and Garrick (1981)

Appendix B

Summary of findings: policy documents reviewed

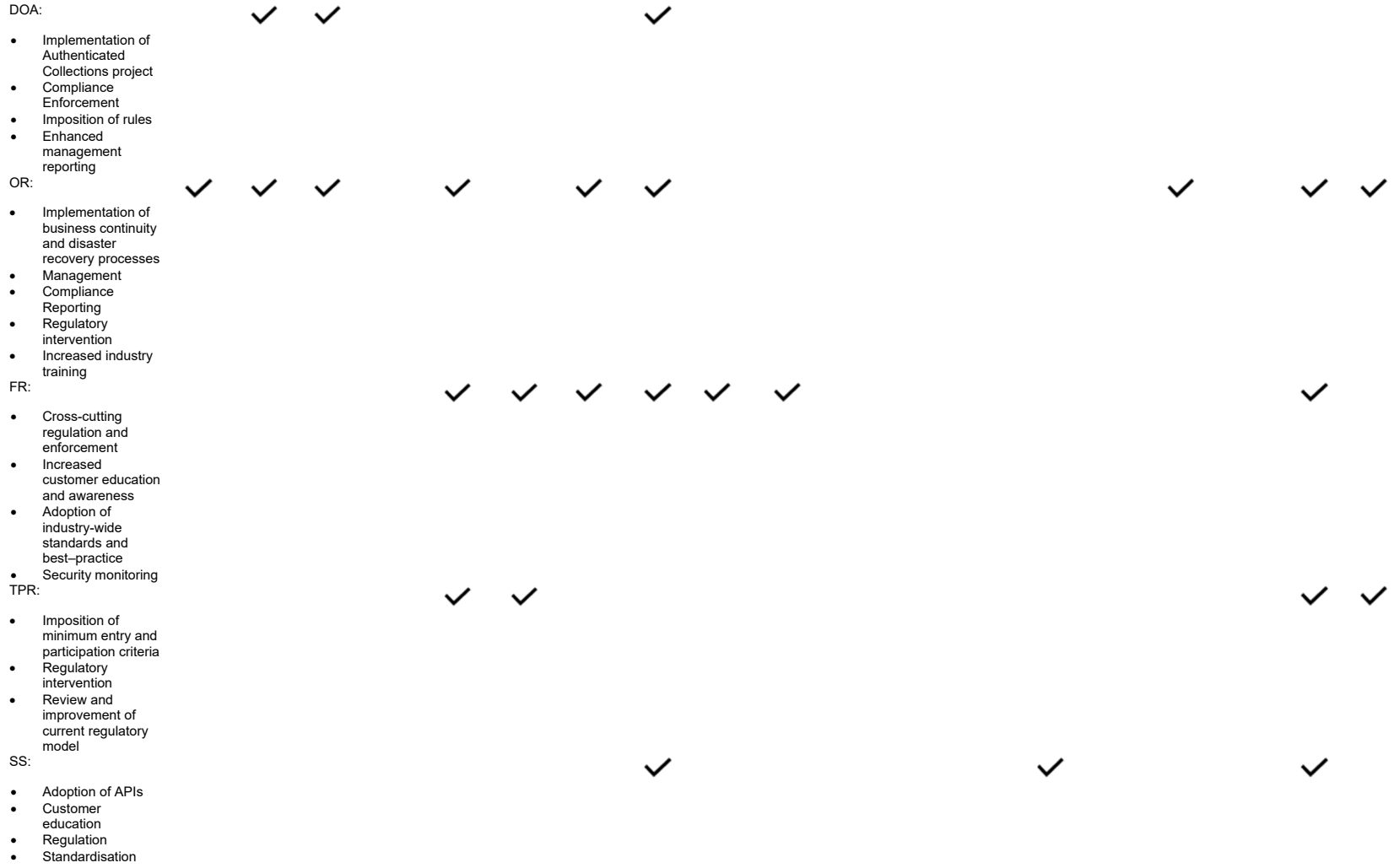
Theme	Findings	Document							
		Annual Oversight Report 2015-2016	Notice on Payroll Deductions 2016	Oversight Framework 2016	Annual Oversight Report 2016-2017	Notice on Sort-at-Source 2017	First Amendment of Directive No 1 of 2017	Position Paper 1 of 2018	Regulatory and Oversight Report 2019
Nature of the Risk	Predominantly focussed on systemic risk.	✓	✓	✓	✓				✓
Outcome	Negative impact on goals, and concern about risks which may result in systemic impact (clearing & settlement risk, operational risk (as pertains to RTGS) risks linked to financial stability, reputational)		✓	✓		✓	✓		
Severity	Risks that pose systemic risk to the industry are regarded as serious			✓	✓				
Probability	Sort-at-Source will impact policy objectives, FMI's can pose risks to the financial industry which may result in systemic risk					✓		✓	
Mitigation	Principles, and Best Practices, Guidance and Directives, Regulation & minimum Requirements. ZAR in CLS.	✓		✓			✓	✓	

Appendix C

Summary of findings: PSMB risk documents reviewed

Theme	*Finding*	*Document*																		
		Feb'16	Apr'16	Aug'16	Oct'16	Nov'16	Feb'17	May'17	Jul'17	Sept'17	Nov'17	Feb'18	Apr'18	May'18	Oct'18	Nov'18	Feb'19	May'19	Jul'19	Sept'19	Nov'19
Nature of the risk	Cyber Security Risk (CSR.)	✓	✓	✓	✓			✓	✓	✓	✓					✓	✓	✓	✓		
	Project Risk (PR.)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					✓	✓	✓	✓	
	Debit Order Abuse Risk (DOA.)	✓	✓	✓	✓	✓			✓								✓	✓	✓		
	Operational Risk (OR)	✓	✓	✓	✓	✓	✓	✓		✓							✓	✓	✓	✓	
	Fraud Risk (FR.)				✓	✓	✓	✓	✓	✓	✓	✓						✓	✓	✓	
	Third-Party Risk (TPR.)					✓	✓	✓										✓	✓	✓	
	Screen Scraping (SS.)								✓	✓	✓				✓		✓	✓	✓		
Outcome	CSR: • Data Compromise • Financial loss • Fraud • Reputational Damage	✓	✓	✓					✓	✓	✓								✓	✓	
	PR: • Non-achievement of project timelines • Non-adherence to project management methodology		✓	✓		✓	✓	✓	✓	✓	✓								✓		
	DOA: • Legal Risk • Reputational Impact • Adverse impact on consumer	✓	✓	✓					✓	✓	✓								✓	✓	
	OR: • System unavailability • Participant processing errors	✓	✓	✓	✓	✓	✓	✓		✓	✓						✓		✓	✓	


FR:
Reputational damage
Financial loss
TPR:
Fraud
The unlevel regulatory playing field
SS:
Data compromise
Fraud
Counterparty risk
Severity
CSR: High
PR: High/Significant-Catastrophic
DOA: Medium
OR: High-Catastrophic
FR: Medium-High/Serious
TPR: Medium
Probability
PR: Almost Certain
OR: Likely- Almost Certain
FR: Unlikely-Moderate
TPR: Unlikely-Moderate
Mitigation
CSR:
Adoption of standards
Compliance enforcement
Regulatory guidance
Centralised management
Education
PR:
Monitoring and management
Revision of implementation plan
Regulatory intervention
Stakeholder communication


DOA:
Implementation of Authenticated Collections project
Compliance Enforcement
Imposition of rules
Enhanced management reporting
OR:
Implementation of business continuity and disaster recovery processes
Management
Compliance Reporting
Regulatory intervention
Increased industry training
FR:
Cross-cutting regulation and enforcement
Increased customer education and awareness
Adoption of industry-wide standards and best–practice
Security monitoring
TPR:
Imposition of minimum entry and participation criteria
Regulatory intervention
Review and improvement of current regulatory model
SS:
Adoption of APIs
Customer education
Regulation
Standardisation

Appendix D

Summary dashboard: contributions of this study to the regulator of the South African NPS and regulated entities

	The regulator	Regulated entities
Finding	**Value/contribution**	**Value/contribution**
The regulator views systemic risk as the primary risk to the South African NPS, whereas regulated entities appear to view risk to their business operations as the main risk to the NPS.	The regulator may wish to consider and articulate risks that are likely to cause systemic impact to guide regulated entities.	Regulated entities may wish to consider the risks they face in a systemic context and articulate possible systemic impact to improve alignment with regulatory understanding.
The regulator is concerned with adverse outcomes for the achievement of policy objectives, whereas regulated entities are concerned with adverse consequences for their individual business operations.	Expression of the relationship between adverse consequences for the individual business operations of regulated entities and the achievement of regulatory policy objectives may assist in enhancing alignment.	Expression of the relationship between adverse consequences for the individual business operations of regulated entities and the achievement of regulatory policy objectives may assist in enhancing alignment
Severity is seldom expressed by either the regulator or regulated entities when considering risk.	A uniform risk-rating scale that can be used by both the regulator and regulated entities to express the severity of risks will assist in more easily identifying risks that may have systemic impact. This will allow for more expeditious management of such risks.	A uniform risk-rating scale that can be used by both the regulator and regulated entities to express the severity of risks will assist in more easily identifying risks that may have systemic impact. This will allow for more expeditious management of such risks.
The probability of risks occurring is seldom articulated by either the regulator or regulated entities.	As with the severity of risks, the use of a uniform risk-rating scale to articulate probability could be beneficial in ensuring alignment between the regulator and regulated entities on high-risk items.	As with the severity of risks, the use of a uniform risk-rating scale to articulate probability could be beneficial in ensuring alignment between the regulator and regulated entities on high-risk items.
The regulator and regulated entities prefer the same controls (regulation and standards) to mitigate risks.	The regulator may wish to engage with regulated entities to understand why they believe regulation to be the most effective way to address the risks they face. The regulator could possibly play a role in the mitigation of these risks.	Regulated entities could benefit from working with the regulator to introduce such regulations and adopt such standards as would be likely to mitigate the risks they face.