The relationship between Determinants of Risk Governance assurance and efficacy of the Public projects in the Government of Dubai from the perspective of Internal Audit Function

العلاقة بين عوامل ضمان حوكمة إدارة المخاطر وكفاءة المشاريع الحكومية من منظور إدارة التدقيق الداخلي في حكومة دبي

by

ALIA MARJAN MUBARAK

A thesis submitted in fulfilment

of the requirements for the degree of

DOCTOR OF PHILOSOPHY IN PROJECT MANAGEMENT

at

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Thesis Supervisor
Prof. Halim Boussabaine

Approved for award:

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ABSTRACT

The government of Dubai has been heavily focusing on the public sector and investing in the infrastructural development of mega-projects to support and increase the economic growth of the nation and have reliable alternatives to the gas and oil sector. These mega-projects may include the construction of major buildings, roads, railway lines and airports. The success of these public initiatives may create the course for the government to decrease its reliance on other sectors. However, not all of these projects are completed on time and adhering to the predetermined budget. Thus, the effectiveness of risk governance has to be analysed to assess the possible risk factors and eliminate them to ensure the success of the future projects.

This study addresses a literature gap that exists for such research of global solutions for the local environment. While a significant sector of research is devoted to risk management in Europe and the United States, the unique culture, location and economy of the United Arab Emirates and Dubai, in particular, have to be incorporated into the understanding of local risk management in order to reach the best outcomes. Thus, risk governance issues, approaches and methods specific to Dubai and other emirates are the primary focus of the present study.

The research presents a comprehensive literature review of different risk governance frameworks to assess and find the context that is most appropriate to use in the Dubai setting. Furthermore, the role of Internal Audit is highlighted as the main procedure impacting the quality and reliability of risk management processes. The study adopts a quantitative methodology and employs a research philosophy of positivism in order to evaluate the collected data objectively and obtain results that create a visual representation of the identified research problem. As a result, a questionnaire with 148 questions with answers based on the

Likert scale was collected from 113 respondents working as the staff from the internal audit and risk management departments in the government of Dubai and some practitioners who were attending the Middle East Risk Management Forum. Then, a reliability test, factor analysis, analysis of variance and correlation analysis were undertaken to assess the answers and relate them to the formulated hypotheses.

The results of the study confirmed the necessity of a specific approach in addressing risk management of the Dubai public sector. The questionnaire revealed that ten possible determinants could be identified in assessing risk governance, including strategy, risk communication, risk culture and financial capacity. By collecting the opinions of managers and executives working in the risk management sector, these factors were appraised and classified. Furthermore, different variables were analysed to find that some of them may be more significant than others. For instance, risk communication was established to be one of the principal factors in affecting risk management as it implies that issues are addressed appropriately and timely. Thus, a model for risk governance specific to the local sector in Dubai was created. This research has multiple practical implications. It may assist policymakers of the Dubai government to develop and implement systematic changes into the current risk management processes. Organisation management may also benefit from the study's results as it presents a number of possible strategies for more successful risk governance.

The presented research addresses the gap in the literature which includes specific needs and issues identified. Its identification of ten factors affecting risk governance in Dubai is based on opinions of professional working in the sector. The development of a detailed risk governance framework that incorporates the nations' geography, history, economy, politics and culture can assist the government and management of Dubai, other emirates and other countries in approaching new mega-projects and securing their success.

الملخص

يجب على المؤسسات التأكد من أنها فعالة من أجل البقاء قادرة على المنافسة وضمان الأداء الإيجابي. ومع ذلك فإن التغييرات المحلية والعالمية بما في ذلك العوامل القانونية والسياسية والبيئية، وكذلك الداخلية يمكن أن تضعف جهود المؤسسات، مما يشكل خطرًا كبيرًا على النشاط التجاري. ولذلك تعد إدارة المخاطر عنصرا حاسما في أنشطة التخطيط والرصد لأي مؤسسة، حيث أنها تسمح بتعزيز الشفافية وتقليل المخاطر المرتبطة بمختلف المشاريع والمبادرات.

الهدف الأساسي للبحث الحالي هو دراسة العلاقة بين حوكمة المخاطر الفعالة والنجاح العام للمشروعات العامة في دبي من منظور التدقيق الداخلي كنشاط ضمان في القطاع العام. بالإضافة إلى ذلك، يقوم الباحث بتطوير نموذج للتحقق من حوكمة المخاطر كأداة ضمان لتيسير الإدارة العليا وادارات التدقيق لتوفير ضمان لفعالية إدارة المخاطر فيما يتعلق بتنفيذ المشاريع.

اختار الباحث استخدام المنهجية الكمية لتحقيق أهداف وغايات هذه الدراسة. تم تصميم الاستبيان كأداة لجمع البيانات تتكون من 148 سؤال وتوزيعها على 500 من الشريحة المستهدفة. تمثلت العينة في القطاع العام في دبي، تم استلام 151 منها (العينة المكتملة فقط 113 من أصل 151 وتم وتحليلها).

اختار الباحث استخدام كرونباخ ألفا لقياس الاتساق الداخلي وموثوقية البيانات، ثم استخدم الباحث المنهج الوصفي لإجراء تحليل مستقل لمتغيرات البحث. بالإضافة إلى هذا التحليل، تم استخدام التحليل لاستخلاص مجموعات كامنة جديدة حول 24 مجموعة كامنة جديدة مرتبطة بحوكمة المخاطر وفعالية المشاريع ودور وظيفة التدقيق الداخلي. تم إجراء تحليل اتجاه واحد للاختلاف (Anova) بين المتغيرات ومستوى الوظيفة. وأخيرا، تم إجراء تحليل الارتباط لتحديد الارتباط بين المتغيرات. يمكن تعميم نتائج هذا البحث على الكيانات في حكومة دبي.

ACKNOWLEDGEMENTS

I owe my deepest gratitude to Allah the Almighty and then to my beloved mother and late father for their blessings and encouragement to achieve my goals.

I am heartily thankful to my supervisor Professor Halim Buossabaine whose encouragement, guidance and support from the initial to the final level enabled me to develop and complete this thesis

Lastly, I offer my regards and blessings to all of those who supported me in any respect during the completion of the thesis.

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Chapter 1: Introduction

1.1 Introduction

The first chapter introduces the background of the research, provides the rationale, and identifies the research problem. The research questions and objectives of the study are discussed to define the goal that has to be achieved in the research. The chapter also outlines hypotheses and the significance of the study as was defined in the research proposal. It concludes with a detailed description of the significance of the study and an outline of the entire thesis.

1.2 Background to the research

The government of Dubai has been investing a lot of time and resources in mega infrastructural development as a way of boosting economic growth and reducing the overreliance on the oil and gas sector. Some of these projects include the construction of major roads, modern railway lines, government buildings, and expansion of airports. Other major projects are still at the blueprint stage and are likely to cost billions of dirhams. According to Munier (2014), the success of these major initiatives is always a priority factor for the government. The ability to complete a given programme as per the planned standards within the set timeline and budget is critical. Unfortunately, not all of such public initiatives are always completed within the pre-determined timeline and using the planned budget. Delays and cost overruns are the most common and undesirable events that often occur in a project. When the government is forced to increase resources for a given project, the promised value for such programme will be reduced. Similarly, when a project is not completed within the planned deadline, it may be affected by external environmental factors such as inflation and unfavourable natural forces. Effective risk governance may help in eliminating or reducing the occurrence of risk factor that may have a crippling effect on a given project.

According to Ellis and Sherman (2014), understanding the most important risk governance determinants that contribute to a project's success is crucial when managing public projects. One should understand how to identify determinants of risk governance in each public programme. The goal in such undertakings is to ensure that all the possible risks in any given initiative are identified early enough and classified in a way that makes the mitigation process less challenging. Although some risk factors are common in almost all public projects, Dempsey (2014) advises that it is important to treat each initiative as uniquely as possible. Assumptions made in each should be realistic and not blindly based on results of previous projects. Internal auditors play a critical role in mapping risk factors at the time that the project will last. Frynas (2015) says that it starts at the planning stage where all the possible risks in a programme have to be identified and the management strategies defined in clear terms, including resources needed to counter them. The plan should also define how chief risk officers and internal auditors should cooperate with the top managers to ensure that such risks are effectively managed in case they occur. In this research, the researcher seeks to determine and assess the most important risk governance determinants that contribute to public projects' success in Dubai from the perspective of internal audit functions.

1.3 Research Rational

According to a report by Wassenaer (2017), the government of Dubai, through Dubai Water and Electricity Authority (Dewa), has launched an ambitious initiative to build the largest concentrated solar power (CSP) in the world at a cost of 14.2 billion dirham. This is just one of the many mega programmes that the government plans to undertake in its effort to improve various sectors of the economy. In fact, Verzuh (2015) observes that 6.3% of the United Emirates government's spending (about 3 trillion dirham) goes to the construction sector. It is a clear demonstration of the growing significance of the sector. These megaprojects are undertaken to achieve specific goals. The emirate of Dubai has taken a lead in ensuring that the country's economy is diversified. Major investments have been made in the sector of transport, communication, security, tourism, and agriculture among others. Most of these projects have been successful even if they were not completed in time. However, the problem of cost overrun and other risks have affected the ability to realise success to the expected levels. As Burtonshaw-Gunn (2016) observes, the existence of risks may not be a proper justification to avoid taking major projects. However, it is crucial to manage the risks to enhance the level of success of programmes. This research focuses on how the assessment of the important risk governance determinants that contributes to the success of public projects. The research will provide critical insights on how the government can manage public project risks and enhance success in each mega initiative that is embraced. It will also provide information on how various stakeholders need to coordinate their activities when handling public projects to ensure that the desired goals are realised.

1.4 Research problem

According to El-Karim, Elnawawy, and Abdel-Alin (2017), major public projects in Dubai have attracted both local and international developers because of the prompt and attractive payment made by the government. However, it is worrying that some of these developers sometimes fail to complete these projects are per the initially agreed terms, citing various economic and environmental challenges. Cost and schedule overrun are some of the major problems that affect the ability to achieve the desired level of success in public projects (Wassenaer 2017). Having a case where a project ends up costing twice as much as the planned budget can be very frustrating. One is left to wonder about the kind of planning and implementation strategies that led to such alarming cost inflations. Effective project managers, as Musa (2017) observes, should foresee all the possible challenges in a project during the planning stage. Whenever the occurrence of a risk factor comes as a shock to the programme management team, it is a sign that there was no proper planning. Such mistakes can have serious financial consequences on public projects, most of which often run into billions of dirhams. Stewart, Warburton, and Smith (2017) argue that the existence of a proper risk governance mechanism in all public projects is one of the critical steps in enhancing success.

That is why the study focuses on determining and assessing the most important risk governance determinants.

1.5 Research questions

Risk governance is a wide topic, and as a researcher it is important to define the specific area of interest upon which the study will focus. The research questions will help in defining the issues that will be investigated when conducting the study. As Mousavi (2015) observes, research questions act as a guide in data collection and analysis. The following are the primary research questions for the project:

I. What are the existing determinants of risks governance in public sector?
II. What are the determinants of project success?
III. What are the audit function task in managing the risks in the public organizations?
IV. What is the association between risk governance determinants and project success?

The researcher used both primary data collected from the sampled respondents and information gathered from the review of the literature to answer the above questions.

1.6 Aim and Objectives

The aim of the research is to determine and assess the most important risk governance determinants that contribute to the project success. Through this study, it will be possible to understand what project managers and government officials need to do to ensure that major risks in public projects are avoided or managed effectively to enhance the ability to realise the desired success. The following are the specific research objectives that had to be realised in the study:

I. To review the existing risk governance frameworks and develop/adopt relevant risk governance framework for Dubai public sector context.
II. To review and extract the most risk governance determinants.
III. To seek the opinion of Auditors and Risk Managers on the importance of the extracted risk governance determinants.

1.7 Research hypotheses

The preliminary review of literature that was conducted during the proposal development stage provided basic information about specific issues of interest in this study. Indeed, further review of the literature was conducted when developing this research and analysis of primary data was done just to have comprehensive information on issues under investigation. The following are hypotheses that were analysed using primary data.

i. There is no significant difference in rating the importance of determinants of risk governance

ii. Determinants of risk governance are positively related to projects' success

iii. Determinants of risk governance are negatively related to the occurrence of negative events of projects

iv. The relationship between determinants of risk governance and project success are moderated by the Internal Audit Function.

1.8 Significance of the Study

Risk governance is an area of study that has attracted the attention of many scholars over the years. Studies have been conducted to investigate major risk factors when undertaking major public projects and how they should be managed. Books and journal articles have been published discussing best practices in programme management and how risks should be managed to achieve the desired goals. However, Bai (2014) observes that most of the existing literature was published based on studies that were conducted in western countries. Most of them are based on studies conducted in Europe and North America. It is important to acknowledge that although the world is increasingly becoming integrated due to technological advancements, there are fundamental differences between the western world and that in the Middle East.

The availability of technical know-how, the infrastructural development, the culture, and local needs in Dubai is different from that of California in the United States. Although it is possible to hire expatriates from foreign countries to work on the local projects because of their expertise, assumptions made in the United States may not hold true in Dubai. The significant differences of the two regions geographically, economically, politically, and even socially means that events that may affect projects in the United States may not be exactly similar to those that may affect projects in the United Arab Emirates. It is of concern that adequate literature is yet to be published on how to manage local risks using the available resources. This study will address that literature gap. This research will form one of the risk management documents that focus primarily on the risk management in Dubai and other emirates within the country. It will be an important guide to the government and private developers within the region currently involved in various megaprojects. It will provide a global perspective of solving local problems.

1.9 Thesis Outline

The researcher designed the study to ensure that every activity was done in a systematic manner and in a way that would ensure the desired goals were achieved. The study had 12 chapters as follows.

- Chapter 1: Introduces the topic and provides the background of the study. The aims and objectives, research questions, the significance of the research, rationale of the study and hypotheses are outlined.
- Chapter 2: Provides a critical literature review in the area of risk governance and related frameworks in the private and public sectors. It presents various views and perspectives on risk governance definitions and frameworks.

- Chapter 3: The literature review discusses the role of Internal audit function, and the extraction of risk governance determinants to develop risk governance auditing framework in public sector.
- Chapter 4: The section provides a further review of the literature on the public project success relevant to the local projects in Dubai
- Chapter 5: A conceptual framework helps in understanding the relationship between determinants of risk governance and project success.
- Chapter 6: Methodology section provides a detailed analysis of data sources, methods of collection, and analysis of primary data. It discusses all the assumptions made in the study.
- Chapter 7: Results includes Reliability analysis, descriptive statistics section which focuses on the effectiveness of the instrument used in the data analysis. Factor analysis section which presents results of each of the tests performed. Analysis of variance section shows the relationship between the independent and dependent variables and Correlation analysis focuses on findings from the correlation analysis of different determinants of risk governance to project success.
- Chapter 8: Discussion section brings together the information obtained from the primary and secondary sources of data.
- Chapter 9: Conclusion provides a comprehensive summary of the entire document.

1.10 Summary

This chapter introduces the topic and provides detailed background and rationale for the study. It discusses the research problem and objectives that should be realised by the end of the project. The research questions are drawn from the research objectives to facilitate collection and analysis of relevant data from both primary and secondary data sources. Hypotheses developed based on the preliminary review of the literature, and the significance of the study is also discussed. An outline of thesis structure is also provided.

Chapter 2: Literature review I: Risk Governance Frameworks

2.1 Introduction

This chapter critically reviews existing literature in the area of risk governance and related frameworks in the private and public sectors. It presents various views and perspectives on risk governance definitions and frameworks. It concludes with a summary of the main issues and research gaps identified from literature and the emerging research questions that will guide the present research.

Risk has invariably existed in the society for a long time; however, its growing complexity has led to the evolution of risk management strategies to control its effects. The capacity to understand the development of risk and manage risk is a critical ingredient for the success of organisations and the society. In recent years, the government's role and efforts in risk regulation and management have intensified. Public sector organisations manage and control risks at multiple integrated levels through policy, legislations, regulatory tools/regimes, feedback loops, and rules (van Asselt & Renn 2011). The different levels represent dynamic subsystems in the public sector that provide interfaces for interaction between the public and state actors. Therefore, effective management of risks relies on the interactions, learning processes, and communication among the various stakeholders acting at the federal or local level.

Risk can be difficult to frame in definitive terms. Its definition is marked by a diversity of perspectives and principles for its detection, evaluation, and management (van Asselt & Renn 2011). In spite of the diverse definitions, risk remains a key consideration in public and public-sector projects. van Asselt and Renn (2011) distinguish between simple and systemic risk. While simple risks have clear causes or effects and involve minimal uncertainty levels, systemic risks are complex and are shrouded in uncertainty/ambiguity. In fact, one of the risk definitions often used is the one given by the International Organisation for Standardisation, i.e., risk is "the effect of uncertainty on objectives" (ISO 2015, p. 13). Therefore, uncertainty is a key component of risk. Uncertainty often results from complexity. The complex social issues and multiplicity of stakeholders in the public-sector context increases uncertainty. The concept of uncertainty means that a risk does not conform to the known principles of causation. Firm-specific uncertainties may be related to R&D, employee/managerial behaviour (strikes), or operations – labour and input supply (Hopkin 2012). In the public sector, uncertainty may come from state policies related to expropriation and nationalisation as well as conflicting stakeholder values and interests. Social and economic policies can also increase uncertainty and risk levels in a country.

The introduction of the concept of risk governance in organisations was meant to support structures for predicting and managing systemic risks that are characterised by high-level complexity, ambiguity, and uncertainty. In the private and public sectors, a myriad of regulatory, social, and organisational pressures influences risks. Risk governance frameworks give a blueprint on how to identify, assess, and manage risks to realise organisational objectives. This literature review involves a synthesis of the existing risk governance frameworks in a bid to develop a maturity model applicable in public sector organisations or projects. It begins with a review of risk and uncertainty definition followed by risk governance definitions and a descriptive analysis of various frameworks. A summative assessment of the main issues and research gaps identified from literature is provided at the summary section.

2.2 Risk, Uncertainty and project risk management

Theorists have attempted to define risk and to develop working models for risk management since the 1950s (Prpic, 2016). Economist Frank Knight, the founder of the Chicago School is often credited with this effort (Besner & Hobbs, 2012).

However, defining risk and what it really entails has been a challenging task. For example, Holton (2010) points out that risk theorists such Knight and Markowitz have not provided a clear definition of risk, and this ambiguity has continued since the 1950s. Besner and Hobbs (2012) for example, point out that Knight considered risk to be an event that could have an impact that can be quantified and measured, whereas uncertainty itself is the source of the risk, reflecting an objective interpretation of risk. On the other hand, Holton (2010) argues that Markowitz focused on the subjective aspect of interpreting risk by basing it on the judgement of decision makers in assessing the likelihood of risk and the resulting variation in expected outcomes.

Alternatively, Sciotte and Bougault (2008) define risk as an identifiable event with negative consequences, while Hubbard (2009) defines it as the chance of an unfortunate event multiplied by the cost that results if such an event occurred, which effectively means that risk is equivalent to the expected loss arising from an event, but such a definition is clearly focused on the financial cost of the outcomes that arise in the event that the risk materializes.

Risk may also be defined as the chance of the occurrence of an uncertain event that is associated with outcomes could be either positive or negative (Reding, 2013). Traditionally, risk was limited to negative outcomes whereas positive outcomes or opportunities were not treated within the context of risk management (Ward & Champan, 2011).

Although risk assessment is often biased toward negative outcomes, the fact is that events with negative outcomes can impose a loss on a project and events with positive outcomes, if missed, can also result in lost opportunities (Wieczorerk-Kosmala, 2014). Additionally, the perception and measurement of risk is often based on perceptions and some degree of judgment, which makes it subjective, but it may also be quantified in objective ways (Simona-Iulia, 2014).

Dealing with risk is inevitable in any project, regardless of its size, and any attempt to manage risks requires understanding how risks are perceived and measured before they can be controlled or mitigated (Aron, Clemons & Reddi, 2005). Hence, regardless of the context or the nature of a project or its size, risk management is a process that involves the identification, assessment, evaluation and mitigation and/or prevention of risks (Mazareanu, 2011). Moreover, although it is not unusual for certain risks to receive more attention than others, it is generally agreed that risk management should be based on a holistic approach, a complex approach that involves understanding the interrelatedness between risks and their various impacts, but so far, the majority of approaches have focused on identifying risks separately and addressing their outcomes individually (Wu & Seco, 2009).

A project is often a complex undertaking that involves multiple stakeholders, numerous interrelated and unrelated processes, and different goals and objectives. It also requires the use of various inputs in these processes to accomplish a set of desired goals and objectives within a specific period of time (Hartono et.al., 2014). A project may also be defined as "a clear-cut investment activity with an explicit purpose and distinct beginning, duration, and end" (Charette, 1996, pp.112-113). The EC also defines a project as "a group of activities that must be realized in a logical sequence, in order to achieve a set of pre-established objectives, formulated by the client" (Zecheru, 2013, p.450). From economic and financial perspectives, moreover, Charette (1996) argues that a project is the course of doing business that involves the lowest opportunity cost and the most efficient way to achieve organizational goals and benefits while utilizing scarce resources.

In the context of project management, a project risk may be defined as the any factor that affects the normal progress of the project or its feasibility (Teller, Kock & Gemunden, 2014). Likewise, a project risk may be defined as any predictable factor that may affect the project at any of its different stages of development (Sarker, 2012), and whether positively or negatively (Carvalho & Junior, 2013). Other definitions by project management associations define risk as "an uncertain event or act of circumstances which, should it occur, will have an effect on achievement of objectives" or "a combination of the probability or frequency of occurrence of a defined threat or opportunity and the magnitude of the consequences of the occurrence" (Hubbard, 2009, pp.89-90).

Even in the simplest and smallest projects, controlling risks is often a complex task given the interrelatedness of inputs, processes and outputs, whereas in much larger projects, the prediction of risk is extremely complex to the point that it may be as reliable as "fortune-telling" (Charette, 1996, p.111). Accordingly, controlling project risks is in itself a complex process that requires robust management procedures (Gheorghe, 2012). These procedures fall under the concept of project risk management, that is, the process of identifying, evaluating, and analysing risks, in addition to formulating measures that aim at mitigating and controlling risks surrounding a project. The process of risk management is not only limited to the design phase, but it is also required while the project is in progress and where it may face numerous uncertainties related to time limits and deadlines, financial shortages, and many other factors (Arias & Stern, 2011).

It is also of high importance to suggest that the phenomenon of a risk has a significantly deep connection with uncertainty. Uncertainty is a concept that is well-recognized in numerous scholarly studies; however, the attitude of underestimating uncertainties is often practiced by various individuals (Hubbard, 2009). In the context of psychology, such attitude is often referred to as the "illusion of control," and it is described as a somewhat inherent characteristic of many people, who tend to underestimate the probability of events and situations to be out of their control.

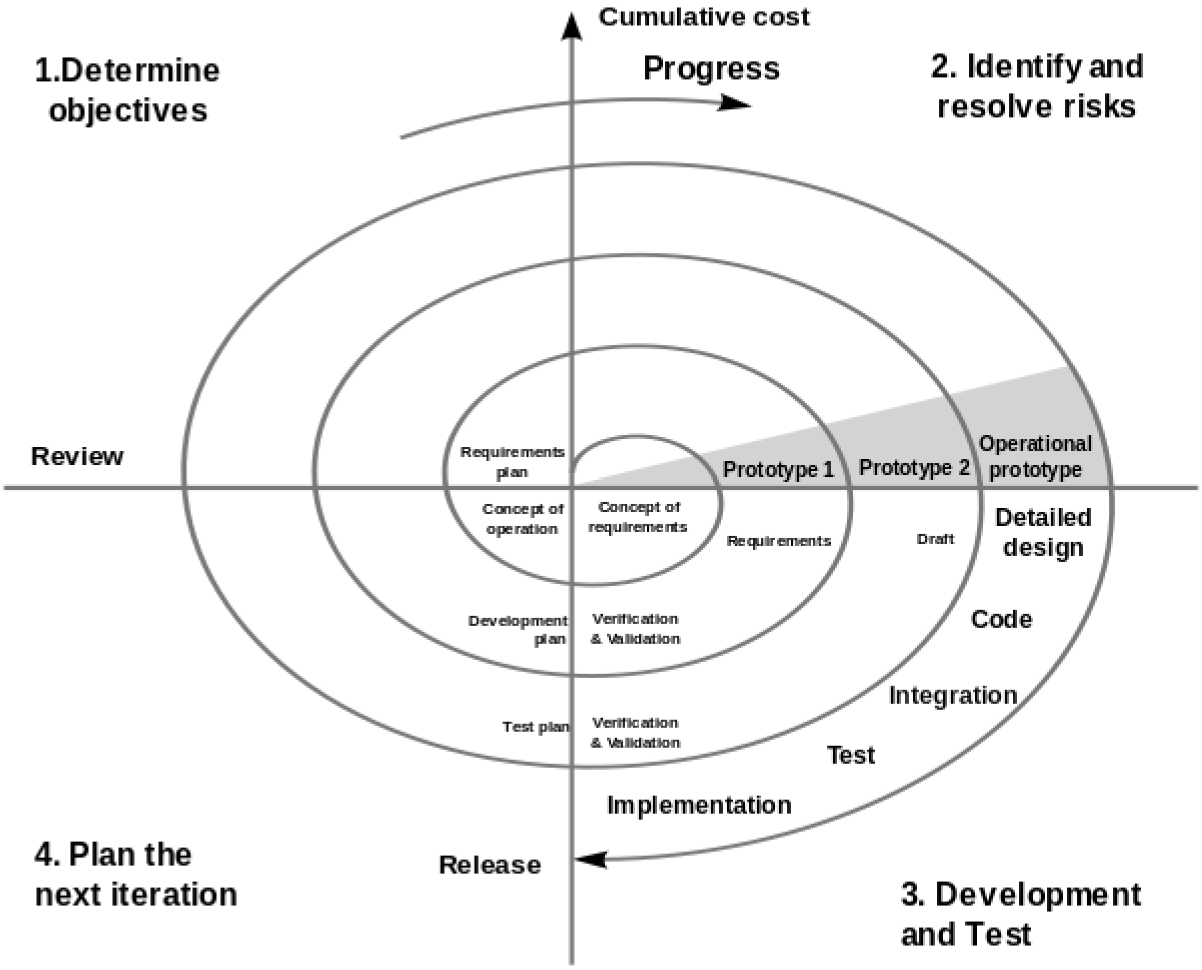
In such spheres as project risk management as well as the estimation of costs and completion times of government projects, the proper understanding of the relationship between risks and uncertainties is of high importance. This is due to the fact that government projects usually involve large amounts of resources as well as people who are responsible for particular aspects of the project implementation (Gheorghe, 2012). Accordingly, larger projects involve more variables that create uncertainty because the diversity of different probabilities contributes significantly to the increased uncertainty of outcomes of the project completion (Gheorghe, 2012). Therefore, the role of risk management as the instrument that can facilitate the uncertainty avoidance is immense.

Another model for risk management that is relevant to project management is the Enterprise Risk Management Model which involves identifying risks, identifying causes, identifying controls, predicting likelihood and the magnitude of consequences, setting quantifiable ratings for each risk, making decisions to avoid or mitigate risks, and finally monitoring and reviewing execution to ensure that risk remains under control (Nocco & Stulz, 2006).

Boehm (1988) also proposed a risk management model for extremely large and complex software projects for government and defence industries. The model constitutes of four stages; determining project objectives and constraints; identifying risks, evaluating alternative courses of action, and resolving risk by taking the necessary decisions; implementing and verifying completion of steps with risk under control; and finally determining if risks remain at an acceptable level before proceeding to the next decision stage (Figure 2.1).

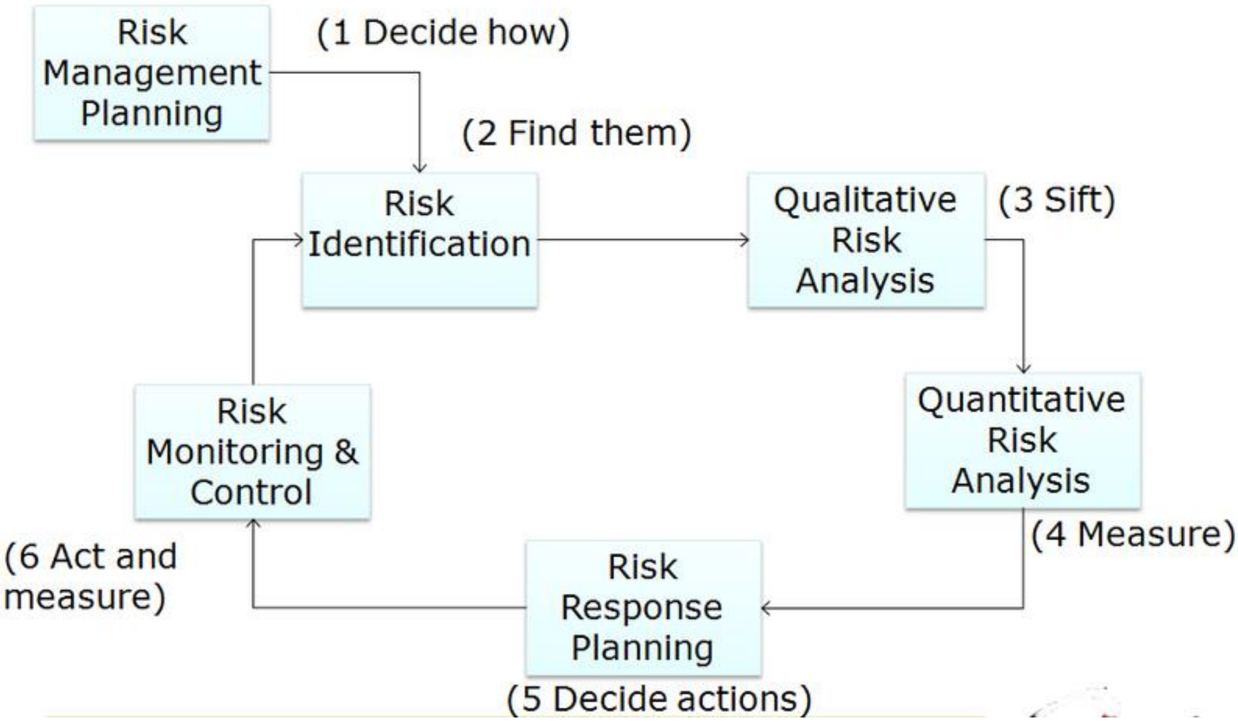
In implementing project risk management, managers have a variety of options to resort to in addressing potential risks. These may include risk mitigation decisions which involves either the reduction and/or elimination of risk; risk retention decisions which involve accepting the risk if the cost of its impact is tolerable or if the cost of retention or prevention is too high; risk transfer which involves the transfer of risk to other parties; and risk allocation which involves distributing the risk, possibly by sharing it with other partners such as entering into a joint venture (Berk, 2012).

Figure2.1. Boehm's Risk Management Model (1988)



The concept of project risk management, therefore, is about developing a framework that entails measures to mitigating and/or preventing any possible threats that may obstruct project progress (Podean, Benta & Mirceana, 2010). Progressive definitions, however, perceive project risk management as the framework that provides management with the ability to avoid or mitigate negative risks and to take advantage of positive risks (Thamhain (2013). This concept is expressed in the standard project risk management process illustrated in Figure 2.2 (Prpic, 2016).

Figure 2.2 Project Risk Management Process Flow (Prpic, 2016)



Project risk management has attracted significant attention from risk management scholars. However, with the growing complexity of projects, scholars have also increasingly paid attention to specific types of risk, especially those with substantial or detrimental impacts on projects (Powell, 2010). In the context of the massively growing size of projects all over the world and also in light of the global financial crisis, financial risk has specifically attracted unprecedented attention (Kerzner, 2013).

2.3 Governance and Risk Governance Definitions

The Standards of IIA define governance as *"the combination of processes and structures implemented by the board to inform, direct, manage, and monitor the activities of the organisation toward the achievement of its objectives.*" (Sawyer's 2012)

OECD has introduced another definition which is "*Corporate governance involves a set of relationships between a company's management, its board, its shareholders. Corporate governance provides the structure through which the objectives of the company are set and the means of attaining those objectives and monitoring performances are determined."* while

OCEG defines governance as: "*Governance is the culture, values, mission, structure and layers of policies, processes and measures by which organisations are directed and controlled. Governance, in this context, includes but is not limited to the activities of the board, for governance bodies at various levels throughout the organisation also play a critical role. The tone that is set, followed and communicated at the top is critical to success." (sawyer's2012)*

A risk, in general terms, connotes the uncertainty or unexpected 'adverse' outcome of a situation or activity. The scholarly literature on risk governance explains the processes and frameworks for managing risks based on diverse definitions of risk governance. Klinke and Renn (2012) define risk governance as a comprehensive risk-handling process for addressing the "complexity, uncertainty, and ambiguity" aspects of a risk (p. 274). It entails an evaluation of the totality of regulations, processes, and systems involved in the risk data collection, analysis, and risk-based decision-making. Therefore, it extends beyond the traditional risk analysis to include normative principles on how public and private actors can manage risks.

Renn, Klinke, and van Asselt's (2011) definition of risk governance follows a technocratic approach. They define it as the organisational structure and policymaking process that guide or control the regulation or mitigation of risks at the group, societal, national, or global level (Renn, Klinke & van Asselt 2011). This definition is based on the shift from centralised decision-making to multi-level public administration that characterise modern governments. In another article, van Asselt and Renn (2011), extending on the International Risk Governance Council's [IRGC] definition, describe risk governance as the application of core principles/concepts of governance in risk-based decision-making extending beyond formal (probabilistic and regulatory models) to include informal processes. The definition is informed by the inadequacies of risk probability models in managing public risks. It includes formal and informal systems for dealing with complex, uncertain, and ambiguous risks. In this article, the concept of governance primarily relates to policy development by government actors. However, since various stakeholders are involved in the management of the society, including nongovernmental organisations and the private sector, the definition has been expanded to include a diversity of actors/roles.

The phrase risk governance is utilised in a prescriptive and in a descriptive context. Decisions about risks involve diverse players, regulations, political systems, and organisational structures – aspects pertaining to governance. Risk decisions are the outcome of the interaction between many players. From a governance perspective, the societal factors that precipitate outcomes characterised as risks need to be analysed for effective mitigation. For Flemig, Osborne, and Kinder (2015), risk governance is both a normative and prescriptive process. They define it as a hybrid of "an analytical frame and a normative model" that guide risk decisions (Flemig, Osborne & Kinder 2015, p. 16). This decision-based risk governance differs from the technocratic approach in the sense that it assigns the decision-making role entirely to politicians.

Brown and Osborne's (2013) definition of risk governance follows a different approach. They define risk governance as transparent engagement with the "nature, perceptions, and contested benefits of a risk" in complex situations (Brown & Osborne 2013, p. 199). This means that all relevant stakeholders in the public service are involved in the decision-making process. This transparent approach has been adopted in the modern public sector to enhance accountability. In addition to inclusive decision-making process, risk environment is characterised by regulations and best practices to enhance accountability in the public sector. Therefore, Brown and Osborne's (2013) definition fits within the transparent risk management approach adopted in democratic systems.

Clearly, an appropriate conceptualisation of the concept of risk governance should encompass a global view of risks that emerge in public investment projects. It should go beyond the traditional concepts of risk management or analysis to include decision-making processes related to a particular project. In this regard, Brown and Osborne's (2013) definition fits well within this description, as it points to decision-making processes in a complex environment, such as the public sector. From a descriptive perspective, an appropriate definition must capture the totality of stakeholders, standards, procedures, and processes involved in making risk decisions. Considering the fact that risk governance goes beyond simple descriptive management of public risks, a satisfactory definition should include the normative elements or rules on how to manage risks in the public sector. It should involve all actors working in a transparent decision-making process. The adopted definition for this paper is that of Brown and Osborne's (2013) who define risk governance as genuine engagement with the "nature, perceptions, and contested benefits of a risk" in complex situations (p. 199). The authors point out that this definition fits well with the characteristics of the public-sector risks, i.e., complexity, ambiguity, and uncertainty.

2.4 Risk Governance Frameworks

Various epistemological premises and ideas contributed the development of risk governance as a concept. While the positivistic/realist view relies on the assumption that a risk is assessed based on some 'real' standard, while the social constructivist approach considers risk a "social process", not as a distinct entity (Renn 2011, p. 71). These ideas helped advance the principles and frameworks for managing contemporary risks. The conceptual use of the term 'risk governance' emerged in recent literature exploring policy development in the public/private sectors (van Asselt & Renn 2011). It is used within the context of public/private governance or development that has roots in the political science field. In this context, 'governance' stresses the role of non-state actors in the management and organisation of societal issues (van Asselt & Renn 2011). This approach challenges the classical policy perspectives that followed a hierarchical power model centred on the government.

In the governance view, collective binding decisions are produced in "complex multi-actor networks and processes" (Jonsson 2011, p. 126). This means that multiple social actors are involved in governance. Besides the state, the other social actors include nongovernmental organisations, private institutions, expert groups, etc. In this regard, power/capacity to organize and manage society is shared among the different actors. Governance can be considered a descriptive and prescriptive term. The descriptive sense of governance relates to the complex interplays between various social actors, structures, and processes (Jonsson 2011). In contrast, the prescriptive definition relates to the model/framework for the management of societal issues. The normative use of governance emphasises on transparency, involvement, and accountability.

The normative-descriptive ideas also apply to risk governance. The word 'governance' is utilised in "a normative and descriptive sense" (van Asselt & Renn 2011). The argument here is that while the regulation/management of simple or systemic risk problems follows the governance framework, risk decisions emanate from interactions between stakeholder groups. The 'governance' view gives a framework for examining and describing the factors precipitating risks. However, the unpredictable nature of risks calls for multi-stakeholder collaboration to adequately address and manage them. In the collaborative frameworks, new risk management principles and approaches are proposed in line with the prescriptive/normative perspective (Renn 2011). Therefore, risk governance is a blend of an analytical framework and prescriptive exemplars.

The usage of the term 'risk governance' has its roots in the lessons learnt from the TRUSTNET undertaking, which developed a model that included collaborative processes in decision-making (Renn 2011). TRUSTNET was a European Union interdisciplinary network established to develop the criteria for determining best practices in the governance of hazards. It comprised 80 experts drawn from regulatory agencies in industrial and medical fields across

Europe. The network developed the concept of risk governance and the first model. Later, this notion was used in literature as an alternative paradigm to the traditional concepts of risk analysis and management by advocating for multi-stakeholder roles, processes, and systems (van Asselt & Renn 2011). However, the risk governance was originally used to mean an all-encompassing system of “risk identification, assessment, management, and communication” (van Asselt & Renn 2011, p. 433). This view is consistent with the IRGC’s definition of the notion of risk governance. The IRGC (2015) incorporates the governance principles of “transparency, effectiveness, accountability, equity, and fairness” into its definition of governance framework (p. 12). The aim is to create effective collective actions to mitigate the effects of emerging risks.

The purpose of sound risk governance is to reduce the unequal risk distribution between different public/private institutions or social groups through multi-actor processes. A risk governance practice also creates consistent and uniform approaches for similar risk assessment and management (Renn 2011). Unlike the traditional approach of risk analysis that focused on high-profile risks, risk governance gives adequate consideration of high-probability risks irrespective of their profiles. It also involves risk trade-offs through effective regulations and policies. The approach also takes into account public perceptions, resulting in high public trust in the system.

2.4.1 Brown and Osborn’s (2013) Framework

The risk governance frameworks provide an approach for the analysis and management of risks within the public service or the private sector. Brown and Osborne (2013) suggest a risk governance model for managing risks related to innovation in the public sector. The framework links three management approaches and three innovation types (Figure 1). The first type is the evolutionary innovation, whereby institutions utilise new “skills or capacities” to meet specific user needs (Bernado 2016, p. 14). The second type is the expansionary innovation, whereby the current skills/capabilities are used to meet expanding user needs. The last one is total innovation, in which new capabilities/skills are developed to address new user needs (Brown & Osborne 2013). The authors offer three risk governance approaches, namely, technocratic, decisionistic, and transparent methodologies. The technocratic model is only applicable in evolutionary innovation. In contrast, the decisionistic model provides a framework for evolutionary and expansionary innovation. The transparent risk governance model can accommodate all the three types of innovation.

Figure 2.3: Risk Governance Framework for Public Service Innovation

Risk governance approach / **Type of innovation**	**Technocratic (risk minimisation)**	**Decisionistic (risk analysis)**	**Transparent governance (risk negotiation)**
Evolutionary	√	√	√
Expansionary		√	√
Total			√

2.4.2 The IRGC's Framework

Another risk governance framework is the IRGC's model that consists of five related phases. The phases include pre-assessment, appraisal, characterisation and evaluation, management, and communication (Figure 2.4).

The model separates risk analysis from the understanding of risks. Risk appraisal is essential in understanding the nature of risks. In contrast, the implementation of risk decisions requires risk management. The framework begins with pre-assessment, whereby the risk is defined to facilitate its appraisal. The pre-assessment phase involves a set of questions that give the baseline data for risk assessment and mitigation. More importantly, it reveals the factors that precipitate the risk and the associated opportunities (Bernado 2016). It also brings out the risk indicators and patterns that help inform the risk management approach. The governance shortfalls that occur during this phase include failure to detect risk signals, perceive its scope, and frame it appropriately.

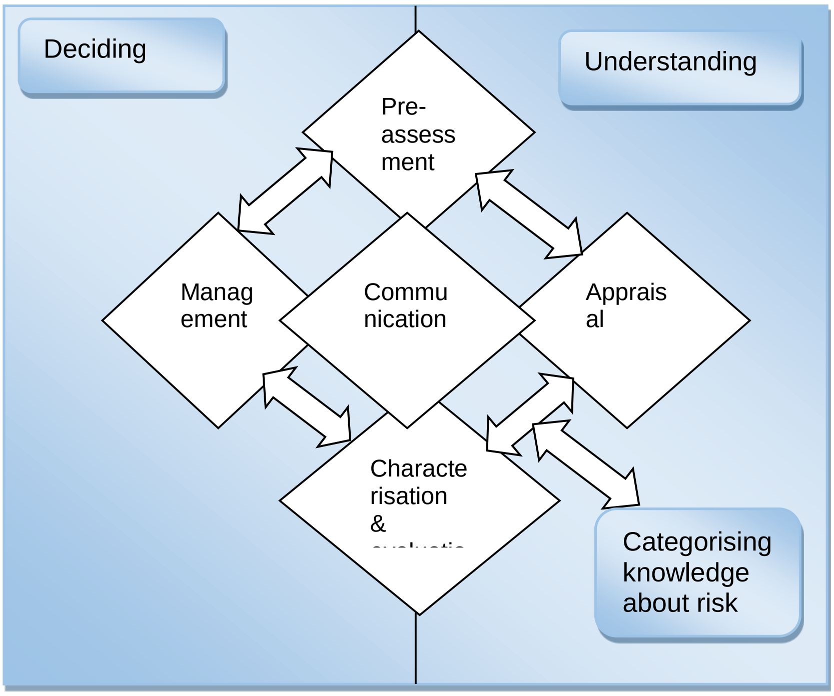
The risk appraisal phase is where facts and assumptions are developed to make a determination if a situation portends a risk and how it should be handled. The appraisal involves scientific approaches, including estimating the probability of occurrence, and risk-benefit analysis based on stakeholder concerns (Bernado 2016). The process ensures that policymakers consider stakeholder concerns and interests when making the decisions. The next phase – characterisation and evaluation – involves the consideration of societal values in decisions related to the acceptability or tolerability of the risk. At this stage, risk mitigation measures are identified for risks considered acceptable or tolerable (van Asselt & Renn 2011). However, if the risk is intolerable, the initiative is halted. The failure to address the issue of inclusivity, transparency, and societal values/needs, and timeframes precipitates risk governance problems.

The fourth phase is risk management. It entails the development and adoption of strategies or activities that help mitigate, avoid, or tolerate the identified risk. In this stage, multiple options are developed and the best one selected for implementation. The risk management processes entail the "generation, evaluation, and selection" of the best risk mitigation strategy (van Asselt & Renn 2011, p. 445). It also entails evaluating the potential impacts of the selected risk mitigation option. The final phase of the IRGC framework is the communication of the risk management decision. Effective communication helps create awareness among stakeholders. It also enables them to understand the stakeholder role in risk governance (van Asselt & Renn 2011). The communication should inform the stakeholders/actors about their specific roles in managing the risk.

The IRGC's framework has been adopted across multiple industries. In this model, an iterative process of communication cuts across the four phases. The IRGC framework is criticised for being one-dimensional. The model depicts risk governance as an additive process with distinct phases. However, researchers argue that the process is rather iterative, with steps like risk assessment and management not clearly delineated (Flemig, Osborne & Kinder 2015). Moreover, since various actors interact and influence each other, risk governance cannot follow a logical sequence.

In the IRGC framework, risk communication remains the unifying factor of the five phases of the model. The IRGC expanded the new framework by introducing deliberation and engagement, suggesting a bipartisan process between the actors. Another significant aspect of the revised model is the emphasis on institutional capacity and resources. The organisational resources/capacities considered in the new model include finances, social capital, human resources, and technological capabilities (Flemig, Osborne & Kinder 2015). It also includes the consideration of the actor network, political and regulatory culture, and the social climate.

Figure 2.4: IRGC's Risk Governance Framework

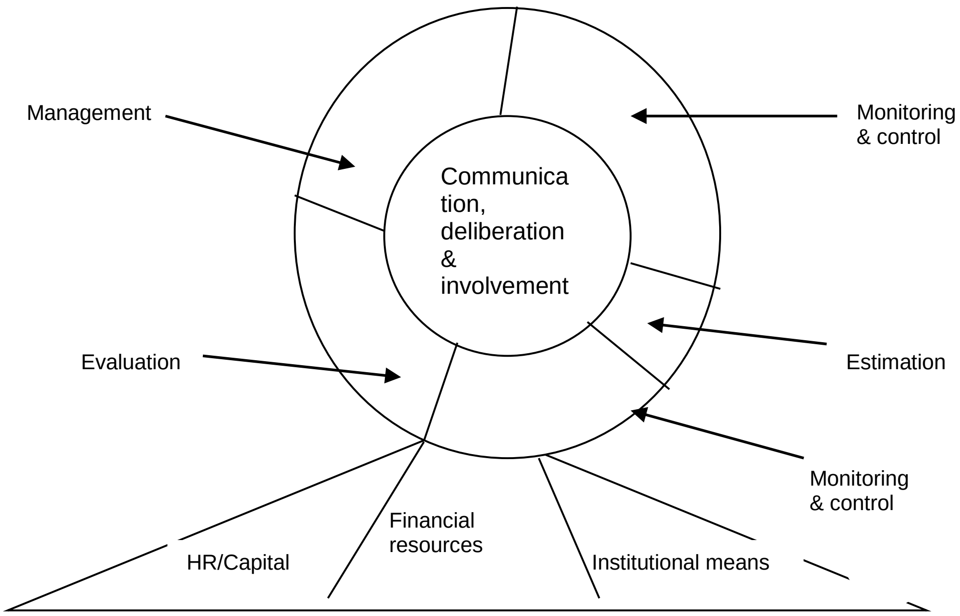


2.4.3 The Modified IRGC Framework

Renn, Klinke, and van Asselt (2011) propose a modified IRGC framework that includes the normative and descriptive aspects of risk governance. The proposed model comprises five stages, i.e., “pre-estimation, interdisciplinary risk estimation, risk characterisation, risk evaluation, and risk management” (p. 237). The modified framework is illustrated in Figure 2.5 below. The pre-estimation stage involves the testing of multiple problems as possible risks. It entails an exploration of societal/community and political agencies and the public to identify factors ‘framed’ as risks. The screening also explores the culturally constructed risk candidates. Therefore, the pre-estimation stage is a multi-stakeholder process that brings together government agencies, industry actors, consumers, and various interest groups.

The second stage, risk estimation, entails the scientific evaluation of risks through risk assessment and concern (societal issues) assessment (Renn 2011). Various approaches can be used in risk estimation. Examples include probability of occurrence, extent of damage, ubiquity, reversibility, etc. The third step, risk evaluation, involves the quantification of the societal effects of a risk and its probability of occurrence. The risk profiles are evaluated based on their level of acceptability (Renn 2011). Low risk situations or activities are considered highly acceptable. Risk management is applied to risks considered tolerable. It entails a suite of mitigation measures to reduce the adverse consequences of a risk. Risk communication/participation entails educating the masses through interactions to disseminate information related to the risks (Renn 2011). The aim is to build trust relationships in risk management through multi-actor inclusion.

Figure 2.5: Modified Risk Governance Framework



The cyclic process of risk governance occurs in a logical sequence of five phases: pre-assessment, appraisal, characterisation and evaluation, risk management, and communication (Roeser et al. 2012). The individual phases and their specific components are described below.

Pre-assessment Phase

The pre-assessment phase is the screening stage of the risk governance process. Here, the actors consider diverse issues related to a specific risk. In addition, the different stakeholders review the risk indicators and practices at this stage. The main components of the pre-assessment phase include "problem framing, early warning, pre-screening, and the determination of scientific conventions" (Roeser et al. 2012, p. 51). The purpose of risk framing is to explore the multi-actor perspectives and establish a common understanding on the risk issues. Based on an agreed risk frame, the signals or indicators of the risk/problem can be monitored.

Early warning helps identify indicators that confirm the existence of a risk. It entails an exploration of institutional capabilities for monitoring early warning signs of a risk within an organisation (Rossignol, Delvenne & Turcanu 2015). Pre-screening encompasses preliminary analysis of risk candidates and prioritising them based on probabilistic models. It also entails identifying the appropriate evaluation and management route for each risk candidate. It is followed by a determination of the main "assumptions, conventions, and procedural rules" required for the assessment of the risk (Rossignol, Delvenne & Turcanu 2015, p. 137). The stakeholder emotions related to the risk issues are also considered in this step.

Risk Appraisal Phase

The purpose of risk appraisal is to create societal standards or scientific thresholds for a risk. It also gives a knowledge base for identifying an appropriate risk mitigation or containment approach. Its main components include risk assessment and concern assessment (Roeser et al. 2012). Risk assessment identifies the cause-effect relationship of a risk as well as its probability of happening. It may involve risk identification and evaluation to estimate its severity. The objective of concern assessment is to explore the stakeholder's anxieties and fears related to the risk (Roeser et al. 2012). It also illuminates the socioeconomic impacts of a risk based on stakeholder perceptions.

Risk Characterisation/Evaluation Phase

This phase involves estimating how acceptable or tolerable a risk is to the stakeholders. Therefore, the two components of this phase are risk acceptability and tolerability. A risk problem considered acceptable has lower adverse impacts on health/environment than a highly unacceptable one (Karlsson, Gilek & Udovyk 2011). This means that the risk does not require mitigation efforts. On the other hand, a tolerable risk has significant trade-offs between benefits and adverse effects. As a result, specific mitigation measures are adopted to reduce the negative effects. Characterisation helps generate an evidence base from the outcome of the risk appraisal phase. In contrast, evaluation involves a consideration of extraneous factors relevant to the risk.

Risk Management

The risk management phase involves the development and application of mitigation actions geared towards averting, diminishing, or retaining risks. It proceeds through a six-step process that culminates in an optimal option for risk management. The first component involves the formulation of an array of options for addressing the risk (Roeser et al. 2012). This initial step relies on the acceptability-reliability considerations relevant to the specific risk. The next step involves the evaluation of the options based on specified criteria, e.g., sustainability or cost-effectiveness (Karlsson, Gilek & Udovyk 2011). Thirdly, a value judgment based on the weights assigned to each criterion is applied to the options. Subsequently, the best option(s) is chosen for further consideration in the fourth step. The fourth and fifth steps cover the execution of the best risk management strategy and monitoring and evaluation of its impact on the reversibility of the risk.

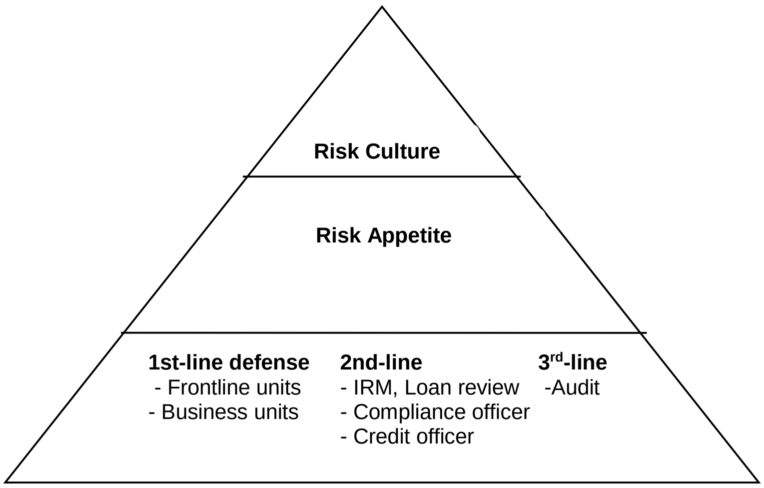
Communication Phase

Risk communication is an ongoing activity during the risk governance process. Its aim is to enlighten non-participating stakeholders regarding the risk decisions emanating from the preceding phases (Roeser et al. 2012). Additionally, risk communication helps support informed choices by stakeholders based on the consideration of societal/individual interests, fears, values, and resources (Roeser et al. 2012). As a result, conflicting perspectives are managed to arrive at a consensus risk management strategy for the institution. Effective communication is also required between policymakers and experts/assessors to avoid bottlenecks related to communication lapses.

2.4.4 The OCC's Risk Governance Framework

Another existing framework is the one proposed by the Office of the Comptroller of the Currency [OCC] for risk governance in the financial industry (Figure 2.6). This model is intended to help the board/management of banks to establish an institutional risk culture, promote compliance with the risk appetite, and create a risk management system for the identification, measurement, and control of risks (IFC 2012). The OCC's framework comprises of three additive steps – risk management system, risk appetite, and risk culture. It takes into consideration the various risk categories common in the financial sector. Examples include interest rate and price, which portend a significant risk to an institution's financial performance.

Figure 2.6: The OCC's Risk Governance Framework



Banks use different risk governance models depending on the nature of its operations and corporate strategies. In banks, the board/management oversees the formulation, execution, and evaluation of a risk governance model through independent assessments. Subsequently, based on the outcomes of the assessment, some or all of the elements of the model are reviewed to enhance its efficacy. In this structure, the institution's senior management does the role of maintaining the framework and managing factors related to the defined risk appetite (Polk 2014). It also regularly informs the board about the institution's risk profile and potential risks. The specific components of this framework are described below.

Risk Culture

In the OCC's framework, risk culture covers the institutional "values, attitudes, competencies, and behaviours" that define the bank's risk governance practices and decisions (Polk 2014, p. 14). It is, therefore, a subset of the organisational culture. The board plays a critical role in creating a sound risk culture through enhanced risk awareness and communication of the acceptable risk levels to the staff. This ensures that the employees make decisions that conform to the defined risk appetite or acceptable risk thresholds. Besides the board, the bank's senior management promote a positive risk culture through staff incentives and sanctions for unacceptable behaviour (Polk 2014). The management is required to identify and address risk-taking behaviour or actions that go beyond the minimum thresholds.

Risk Appetite

In the OCC's framework, risk appetite is considered an important element of sound risk governance. It entails the "aggregate level and types of risk", which the board and the senior managers can assume to realise the institution's strategic goals or objectives (Polk 2014, p. 13). However, a bank's risk appetite must not exceed its capital or liquidity level. The establishment of a risk appetite involves concerted efforts from the board, senior managers, supervisors, and front-line staff. Furthermore, its execution requires effective interactions between the various stakeholders involved in the management system. Information about the bank's risk appetite should be conveyed throughout the institution to ensure that risk decisions are aligned with the acceptable risk thresholds. The risk management and front-line units should track, evaluate, and report the risks based on the risk appetite policy.

Risk Management System

The third component of the OCC framework is the risk management system. It encompasses policies, processes, and staff involved in the identification, measurement, tracking, and management of risks (Polk 2014). The nature of a bank's risk management system depends on economic conditions that the organisation operates in and the complexity of its organisational structure. It entails three defensive structures. The first defensive structure involves "the frontline units or business units that create risk" (p. 46). The frontline/business units are the primary risk takers, and therefore, they must operate within the accepted risk appetite thresholds. The second defensive structure is the internal risk management (IRM) unit, which oversees the risk taking activities of the frontline units (IIA 2013). The IRM also recognises, measures, and tracks emerging risks and participates in risk decision-making in the bank (IIA 2013). Ordinarily, the IRM comprises of the credit officer and/or credit review manager. The final defensive structure in this framework is the audit unit, which facilitates external validation. It implements internal controls to ensure effective risk governance within the institution.

The International Finance Corporation (2012) extends the OCC's risk governance framework by including the concept of conflict of interest. The elimination of possible conflict of interest situations is essential for effective risk governance in the financial sector (IFC 2012). It entails separation of duties, independent management of activities, and adequate revenue control systems in the bank. Effective communication is also required in staff education, deliberations, and reporting of risks in financial institutions.

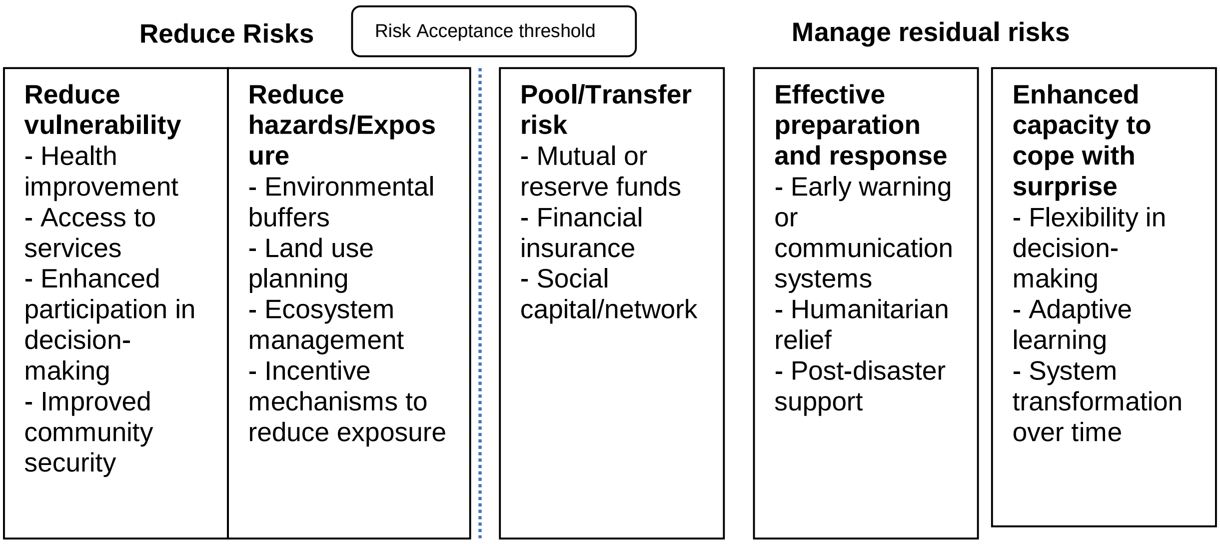
2.4.5 IPCC Risk Governance Model

The Inter-Governmental Panel on Climate Change's [IPCC] (2012) developed a model for managing risks related to natural disasters. The key components of this model include methods for reducing risks and for managing the residual risk related to environmental hazards. The reduction of risks focuses on minimising vulnerability, hazards, and exposure (IPCC 2012). It also entails sharing or transferring the risk through mutual/reserve funds, financial insurance, and social capital.

In the public sector, risk vulnerability is reduced through society-level actions such as access to essential services, improvement in community security, and increased participation in decision-making. On the other hand, the reduction of the exposure levels to natural risks can be achieved through land use planning, incentive mechanisms, and ecosystem management, among others (IPCC 2012). The risk reduction phase of the IPCC framework also entails pooling or transferring of risks. This requires interventions like reserve funds, insurance cover, and social networks.

The second phase of this framework comprises the management of residual risks/uncertainties. The natural risks are managed through effective preparation and response and the enhancement of the capacity to deal with surprises (Hooper 2014). In this regard, the government can manage residual risks by implementing early warning systems, post-disaster support, flexible decision-making systems, and adaptive learning, among others. The IPCC model is illustrated in figure 2.7 below.

Figure 2.7: IPCC Risk Governance Framework



2.4.6 Risk-enabled performance management (REPM) Framework

Private sector organisations are shifting to performance-based approach to the management of risks. The risk-enabled performance management (REPM) focuses on value creation by supporting robust decision-making and the identification of business opportunities, while minimising uncertainties or risks (Palermo 2011). Therefore, using the REPM framework (Figure 2.8), organisations can achieve risk-enabled performance as opposed to simple identification and measurement of risks. In this way, the firm can obtain additional value from its risk management initiatives – a benefit that may not possible when the focus is on risk avoidance or minimisation alone. In the REPM framework, multiple business processes and components interact to create value for the organisation. The main components of this framework include strategic oversight/planning, business-level planning, operational execution, and monitoring and compliance.

Strategic Oversight/Planning

This component focuses on a range of board or senior management-level activities that triggers the development of a risk-enabled organisation. The strategic oversight function entails establishing risk governance "structure, roles, and responsibilities" of each individual within the organisation (Palermo 2011, p. 9). This role is achieved through delegation and performance evaluation. It is also incumbent upon the executive leadership to specify the appropriate risk appetite for the organisation. In this way, the capital allocation and investment decisions can be aligned with the acceptable risk thresholds. The oversight role also entails the identification of emerging risks and performance management to realise the value of the risks.

Business-level Planning

It encompasses the conversion of business strategies into plans and budgeting. The organisation can use planning tools to analyse the "types and levels" of each risk inherent in a given investment (Palermo 2014, p. 328). In this way, the organisation will create a basis for risk-based investment and budgeting.

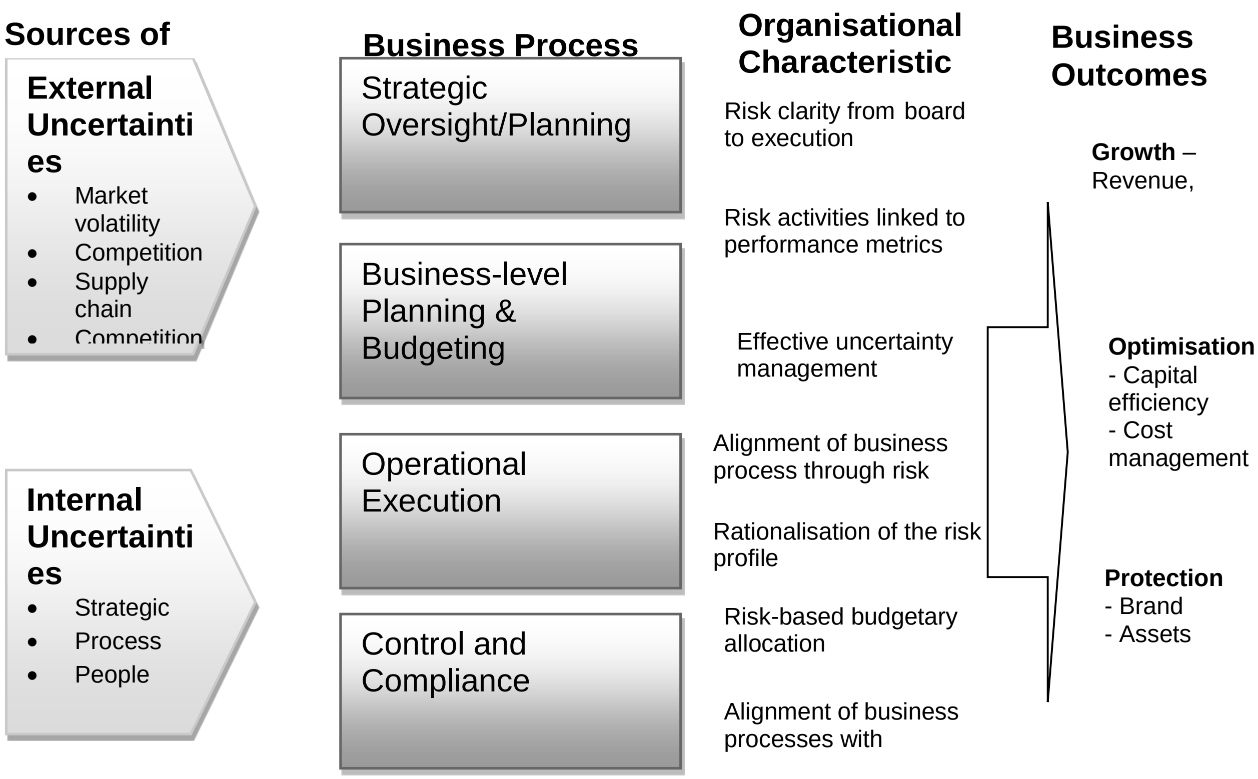
Operational Execution

This step covers the implementation of strategic plans from the previous stage. The operational reviews should consider the identified risk limits and appetite in evaluating performance (Palermo 2014). The risk tolerances indicate how well the firm's operations are aligned with the established risk appetite. Another dimension of operational execution is the re-evaluation of risks linked to operational activities. The aim is to minimise possible 'surprises' or uncontrollable events in organisational operations.

Monitoring and Compliance

This phase entails audit and compliance measures. It involves the alignment of the "monitoring processes with the risk profile" to detect redundancies and inadequacies in the monitoring function (Palermo 2014, p. 331). An in-depth evaluation of the risk profile and the deployed monitoring measures can reveal issues or problems that could precipitate costly risks. Thus, the approach reduces costs and improves the efficacy of risk surveillance. The REPM framework was shown to give a clear risk profile of a power plant and facilitate more efficient budgeting for risk mitigation programs.

Figure 2.8: REPM Framework – Risk-enabled Organisation



2.4.7 Enterprise Risk Management Framework

The enterprise risk management (ERM) supports effective management of uncertainty in organisations. It entails a comprehensive model for the identification, measurement, prioritisation, and management of risks that threaten business activities or operations (PWC 2015). The ERM framework involves the development of a portfolio view of risks based on organisational operations at all levels, including enterprise-level, division/subsidiary, and business-level processes. The senior management first explores the interrelationships among risks before formulating a portfolio view from a business unit level and entity level (PWC 2015). The ERM framework comprises eight interrelated components. They include internal environment, objective setting, event identification, risk assessment, risk response, control activities, information and communication, and monitoring (PWC 2015).

Internal Environment

A focus on the internal environment creates a risk management philosophy that leads to an increased recognition that both anticipated and unanticipated events may happen (Karim 2011). An internal environment focus also helps define the organisational risk culture and the actions that affect it.

Objective Setting

The formulation of business objectives should involve a risk strategy. Such an approach establishes an organisation’s risk appetite, i.e., the board- and management-level view of the acceptable risk levels. Through objective setting, the management can align risk tolerance with the established risk appetite.

Event Identification

The event identification step helps distinguish risks from opportunities. Risks involve events that impede the attainment of the business objectives, while those with a positive effect constitute the opportunities for strategic action (PWC 2015). Event identification is critical in each decision level, when implementing process or system changes, and for new projects. The initial risk identification process helps identify a risk profile for the organisation. Thereafter, more risks are identified for inclusion in the risk profile, as the event identification step becomes a part of the organisation’s culture.

Risk identification entails the identification of the incidents, whether internal or external, which could impede strategy. It also addresses the internal and external factors that affect an organisation's risk profile. The risks are grouped based on their sources for easier root cause analysis and assignment of mitigation responses (Ng 2015). The major sources of risk include political influences, decision-making, human capital, natural events, and regulatory issues. The other sources of risk may be fraud, supplier factors, technology, and competitive pressures.

Risk Assessment

The assessment of the identified risks is the second step of the ERM framework. The assessment allows the management to formulate appropriate risk responses based on the likelihood/probability of occurrence and anticipated impact – using a risk rating scale (Ng 2015). The likelihood rating ranges from highly certain to unlikely to occur. In contrast, the risk impact rating focuses on the effects of each risk, including financial costs, missed operational milestones, regulatory breaches, failure to meet strategic objectives, and managerial staff turnover. A risk map is constructed from the results of the assessment.

Risk assessment gives a comprehensive picture of how potential risks may influence objectives. Therefore, the assessment focuses on the likelihood and impact and involves both qualitative and quantitative techniques. The risk is measured on an "inherent and residual basis", taking into account the predefined time and objective horizons (Ng 2015, p. 14). The aim is to inform future actions or risk responses.

Risk Response

In this step, the entity identifies and develops responses to each identified risk. In this regard, the organisation considers multiple options based on its "risk appetite, cost-benefit analysis of the risk, and the degree to which a response will reduce the risk impact or likelihood" (Domokos et al. 2015, p. 8). After an analysis of a suite of risk/response options, the organisation selects and implements an optimal response to mitigate the risks. In this case, the organisation's inherent and residual risks are measured during the execution of the risk response to achieve the desired risk level. Inherent risks differ from residual ones in the sense that they occur prior to the execution of any risk control or response.

The response options include the portfolio of management actions aimed at controlling or preventing the risk. The management can choose to mitigate, exploit, accept, transfer, or avoid a risk. Risk mitigation encompasses actions taken to minimise the likelihood of occurrence or impact of a particular risk (PWC 2015). Mitigation activities may include budget controls, forecasts, enhancing accountability, staff motivation programs, and building appropriate skill sets (Andreeva, Ansell & Harrison 2014). Risk exploitation allows an entity to leverage on opportunities presented to grow through activities such as strategic alliances, business portfolio expansion, innovative product development, and organisational restructuring.

The management can also choose to accept the risk impact and probability of occurrence. Risk transfer, as a response option, involves activities meant to shift the loss/impact to other parties. It can be achieved through outsourcing, insurance coverage, and hedging (Andreeva, Ansell & Harrison 2014). Risk avoidance involves activities meant to prevent hazards from occurring. They may include ceasing operations, divestiture, or reducing the scale of operations.

Control Activities

This step involves an ongoing process of tracking and reviewing the risk profile and responses (Mathews & Kompas 2015). The aim is to ensure that the management of risks occurs as planned, determine the relevance of the risk responses being executed, and track the impact of the activities on the risk profile. In addition, the control activities can inform new response plans for emerging risks. Risk monitoring comprises diverse methodologies for review, assurance, and auditing risks. The assurance techniques involve post-implementation reviews, performance appraisals, and quality reviews, among others.

The measurement of a response option should involve its efficiency and effectiveness (Walker, Tweed & Whittle 2014). In this case, efficiency indicates the execution costs related to finance/budget and time. In contrast, effectiveness indicates the extent to which the responses minimise the risk impact or probability of occurrence (Walker, Tweed & Whittle 2014). To achieve a higher level of response efficiency and effectiveness, the control activities should be incorporated into the current business processes at all levels of the organisation.

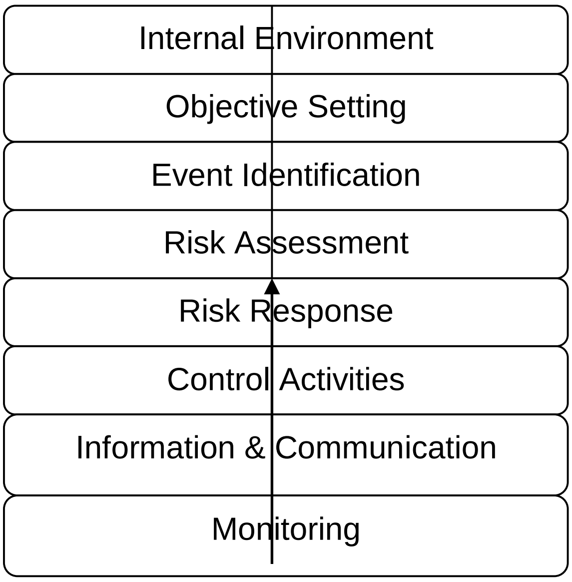
Information and Communication

This step involves reporting the risk in terms of its status and related responses. Various employees play different roles in the ERM process. The board plays a role in policy design and ERM framework development while the management oversees the implementation process. Having a risk reporting structure helps address issues that affect the response plan being executed. It helps staff responsible for various ERM activities to obtain pertinent information to effectively carryout their roles. The internal reporting process involves the operational staff, management team, senior leadership, and the board. In contrast, external reporting involves the communication of the risk profile and responses to the stakeholders.

Monitoring

The efficacy of the ERM elements is monitored regularly to determine the impact on the risk profile. The ERM monitoring may involve ongoing control activities or independent evaluations, such as audits and reviews.

Figure 2.9: ERM Framework



2.4.8 Integrated Enterprise-Risk Management Framework

The banking sector faces unique challenges that pose a threat to growth. The integrated enterprise-risk management (ERM) framework provides a new approach to risk in the banking industry, which is structured around five dimensions. It places the responsibility of developing the ERM capabilities at the hands of a firm's board. The five core dimensions of the integrated ERM framework include "risk transparency and insight, risk appetite and strategy, risk-related business processes and decisions, risk organisation and governance, and risk culture" (Brodeur et al. 2010, p. 1). The recommended actions in each of the five steps are described below.

Risk Transparency and Insight

Most firms have adopted risk identification processes for an early detection and prioritisation of risk events. The companies produce annual risk reports cataloguing the most significant risks and their likelihood of occurrence and impact. The only downside to this approach is that they omit company-wide risks, fail to reveal the causes of the risks, and overlook the multiplicity aspect of risks (Lamarre & Pergler 2009). A robust risk identification mechanism should uncover the root causes. The main components of risk transparency and insight proposed under the integrated ERM framework are risk taxonomy, a prioritised risk heat map, risk insight and foresight, risk models, and risk reporting.

Risk taxonomy entails creating common vocabulary for the risk types experienced or likely to occur (McNeil 2013). The rationale is to facilitate risk identification and classification for effective management and control. A prioritised risk heat map sorts the risks based on their potential impact, level of preparedness, and likelihood of occurrence (McNeil 2013). One recommended strategy for building a robust heat map is through adequate risk estimation that takes into consideration all the risk drivers. A good heat map can also be generated if a transparent and coherent approach is taken in naming and classifying risks across all the business units. In addition, besides likelihood and impact considerations, other variables – preparedness and lead-time –should be taken in account when constructing a risk heat map.

Another element of the first dimension of this framework is risk insight and foresight. It entails using scenario testing, indicators, and stress tests to explicate high priority risks at the board level (McKinsey & Company 2013). Firms often use these methods to explore up to five risks that are significant to business operations. Constructing risk models can also provide a basis for business decisions for organisations. The subsequent step entails compiling insightful reports on key risks to illuminate the key actionable measures. Well-designed and integrated risk reports should highlight the board’s assessment of the risks, including the trade-offs considered and the decisions made to facilitate consistent information flows across the organisation (McKinsey & Company 2013).

Natural Ownership, Risk Appetite, and Strategy

This step entails deciding on the risks an organisation owns, its risk capacity, risk appetite, and risk strategy. A firm’s risk appetite depends on its risk capacity, which describes a company’s ability to “withstand a risk when it materialises into actuality”, while staying clear of undesirable effects or constraints (Brodeur & Pritsch 2008, p. 12). The determination of risk capacity depends on the type of risk and may involve Monte Carlo simulations or discrete scenarios that would then help predict future trends. The risk appetite indicates how much risks a firm will take based on its capacity (McNeil 2013). From its risk appetite, a company can determine the risks it can own. Risk ownership describes the risks a firm has the capacity to control and exploit in order to realise its competitive goals (McNeil 2013). At the same time, a firm needs to define the risks it wants to mitigate, transfer out, or avoid at this point. Based on the risk appetite and ownership, a risk strategy for the company is formulated. The strategy represents a coherent message or affirmation of the risks that the company has decided to take or transfer. It is normally adapted in the organisation's strategic plan and communicated to the shareholders.

Risk-related Decisions and Processes

This step entails the integration of risk considerations related to strategic planning, resource allocation, and financing in risk-related decisions and processes (Brodeur et al. 2010). A firm's strategic choices should reflect its risk appetite/capacity. Strategic planning considers the risk assumptions and uncovers the return/risk tradeoffs inherent in a project. Resource allocation gives key personnel the green light to take risks based on the established risk appetite. On the other hand, financing or hedging decisions by the board would depend on the defined risk capacity and potential impacts. In the banking sector, the quality of risk-related decisions/processes depends on how well the liquidity risk is managed in the organisation (Brodeur et al. 2010). Therefore, in banks, risk-related decisions are aimed at managing and controlling liquidity risks.

This integrated ERM dimension encompasses three elements: risk-related decisions, risk optimisation, and risk processes. Risk-related decisions entail the grounding of risk in all business decisions, as opposed to working to meet regulatory requirements. Similarly, risk optimisation must also be embedded in all strategic decisions to achieve favourable return/risk tradeoffs. In addition, the core business operations of the firm must be risk-based to ensure risk-informed responses and actions across all levels of the organisation.

Risk Organisation and Governance

The role of risk oversight belongs to a firm's board. In the risk governance structure, the board collaborates with the line managers and risk officers on risk issues and ensures that the ERM program is optimised for the specific risks that the firm faces. The oversight role also includes the evaluation of risks through the board-risk committee interactions and dialogue (Pergler 2012). The aim is to remove bureaucratic processes that impede effective risk governance. An ERM organisational model may involve a risk officer reporting to the firm's chief executive officer and leading teams tasked with the management of various risks affecting the organisation.

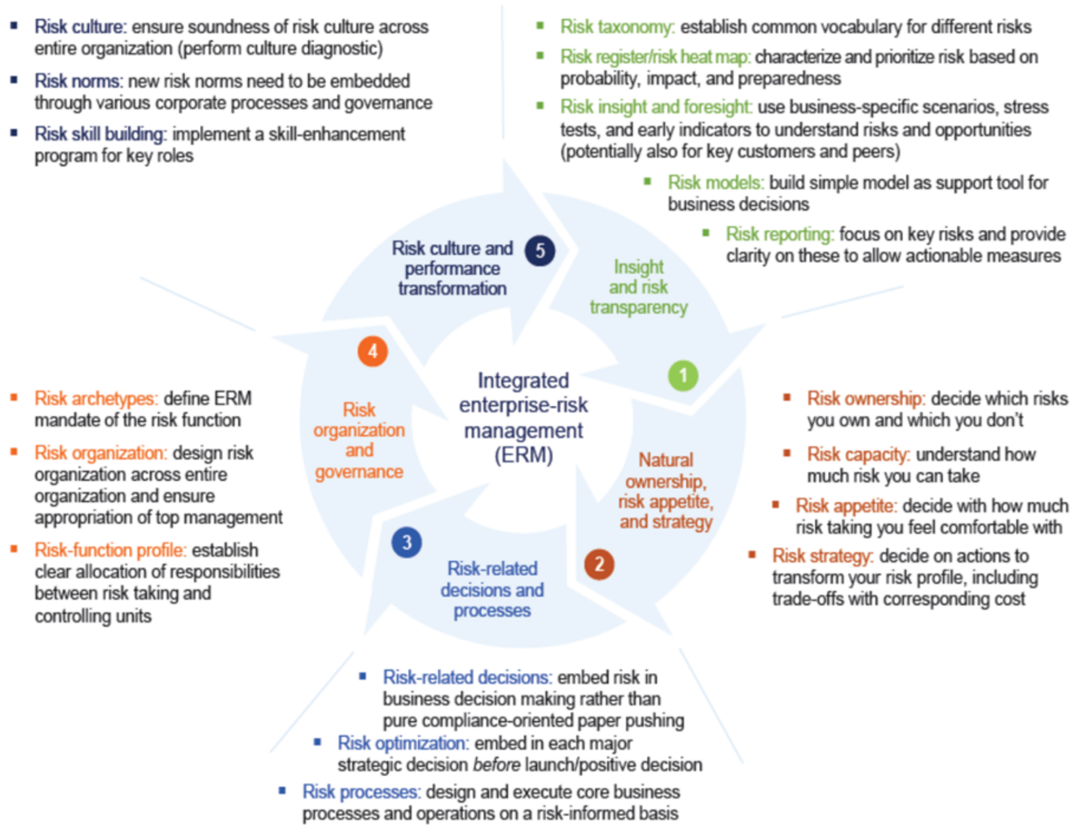
The basic components of an ERM organisational model include risk archetypes, risk organisation, and risk-function profile. Risk archetypes entail defining the mandate of an ERM function within the finance unit to introduce risk thinking in managerial processes (Beckers et al. 2013). Risk organisation involves the design of enterprise-wide processes, including risk policies/guidelines and resource allocation. Creating a risk-function profile can help the risk team obtain traction in a firm's businesses. It entails a clear allocation of duties and obligations of the risk-taking personnel and risk management unit.

Risk Culture and Performance Transformation

The final ERM dimension focuses on risk culture and performance. Risk culture emerges when decision-making behaviours that involve an evaluation of risk/benefit trade-offs become the norm in the organisation. It is defined as the "norms of behaviour for individuals and groups within a company that determine the collective willingness to accept or take risks" (Brodeur et al. 2010, p. 5). Appropriate risk norms should be embedded within the organisation through corporate-level processes and governance.

A cultural survey or diagnostic can help determine the flaws in a firm's risk culture, necessitating the need for a change. Mikes (2011) provides four strategies for effecting a sustainable cultural change related to risk in an organisation, namely, fostering conviction/understanding among employees through incident reviews, role modelling by supervisors, talent and risk skill development, and establishing formal structures/processes for performance appraisal and compensation. According to Mikes (2011), the process of achieving a high-level risk culture change encompasses four steps: diagnostic risk culture, target risk norms articulation, development of multilayer initiatives, and ongoing monitoring of risk governance in the organisation. Therefore, the risk culture journey culminates in positive risk norms being embedded in all organisational structures and processes.

Figure 2.10 Integrated ERM Framework



2.4.9 Risk IT Framework

Public organisations and private enterprises face IT risks in addition to strategic, operational, and market risks, among others. Poor IT security in organisations increase the likelihood of business risks related to cyber threats. The management of such risks is critical to the success of an organisation. The adoption of IT brings immense benefits to an entity; however, it also comes with risks.

Since IT lies at the heart of operational efficiency, IT risk is regarded like other enterprise risks that impede the achievement of strategic goals (Deloitte 2014). In most organisations, the management team does not handle IT risks, but delegate this role to the IT department. The risk IT framework (Figure 2.11) helps businesses integrate IT risk governance into the ERM to support risk-based decisions. The framework also highlights the nature of the risk as well as the organisation's risk appetite and tolerance to facilitate appropriate risk responses. Therefore, it supports risk-aware decisions by organisations.

The risk IT framework is founded in six core principles that support risk governance in the organisations. The organisation must continuously connect the risk responses to the business objectives, align the management of the risk to its ERM, balance the risk costs and benefits, enhance risk reporting, establish top leadership risk appetite, and incorporate these processes into the day-to-day business activities (Deloitte 2014). The risk IT framework contains three components or domains, namely, risk governance, risk response, and risk evaluation (Svata & Fleishmann 2011).

Risk Governance

This risk IT domain ensures that risk management practices are integrated with the business processes for enhanced risk-based performance. Risk governance encompasses three processes, namely, integration with ERM, formulation of risk-based decisions, and establishment/maintenance of a common risk view (Svata & Fleishmann 2011). The goals of risk governance are to achieve acceptable risk appetite and tolerance, enhance role clarity in IT risk management, promote risk awareness, and establish a risk culture in the organisation.

In the risk IT framework, risk appetite is defined as the "broad-based amount of risk" that an entity can accept in pursuing its mission (Svata & Fleishmann 2011, p. 51). In contrast, risk tolerance means the acceptable variation around organisational objectives (Svata & Fleishmann 2011). These two concepts help an organisation establish a coherent view of the risk at all levels. However, they are subject to changes in technology, firm structures, and macro environment factors. Therefore, a firm should continually evaluate its risk portfolio to determine its risk appetite at different times. On the other hand, risk tolerance can be influenced by mitigation costs. Indeed, in some cases, the cost impact of mitigation can go beyond its resources, resulting in a higher risk tolerance (Svata & Fleishmann 2011). Thus, the cost-benefit trade-offs determine the risk levels that an enterprise is willing to tolerate.

The framework also defines the responsibilities of the people involved in IT risk governance. Various individuals are charged with the responsibility of managing IT risks. The board, chief executive officer, and chief risk officer as well as the personnel drawn from enterprise risk committee play a role in risk governance. In contrast, accountability applies to individuals who allocate resources or authorise specific actions, e.g., the board. Besides establishing responsibilities and accountabilities, risk governance enhances risk awareness and communication in the organisation. Risk awareness entails the recognition of risks for a specific management action. In contrast, risk communication enhances the discussion around risks to increase the management's understanding of its effects for appropriate responses. An open risk communication practice enhances risk awareness among stakeholders and increases transparency in risk governance.

Risk Evaluation

The goal of the risk evaluation component of the risk IT framework is to identify, analyse, and provide "IT-related risks and opportunities" in the organisation (Flemig, Osborne & Kinder 2015, p. 6). It entails three processes, namely, analysing the risk, establishing an institutional risk profile, and collecting data. The goals are to highlight the business impact and develop risk scenarios. The evaluation entails converting IT risks into business risks. It requires the IT and the business teams to develop a mutual understanding of the risks that need management. The stakeholders must have a basic understanding of the risks impacting the business objectives. In this regard, the IT person should know the impact of the identified IT risks on strategic objectives. Similarly, the management should understand the IT-related risks that affect business processes (Flemig, Osborne & Kinder, 2015).

Risk evaluation helps define the link between anticipated IT risks and their impact on operations through the expression of such risks in business terms. The methods prescribed in the risk IT framework for risk evaluation include the balanced scorecard, COSO ERM, and the COBIT information criteria (Potts & Kastelle 2014). Risk scenarios are important in IT risk governance. The scenarios are utilised in risk analysis to determine the likely impact of a risk to the organisation. Two complementary methods are used to develop the risk scenarios: a top-down approach and a bottom-up approach. The latter utilises generic scenarios to develop improved scenarios tailored to the organisational realities, whereas in the former approach scenarios are derived from the business objectives.

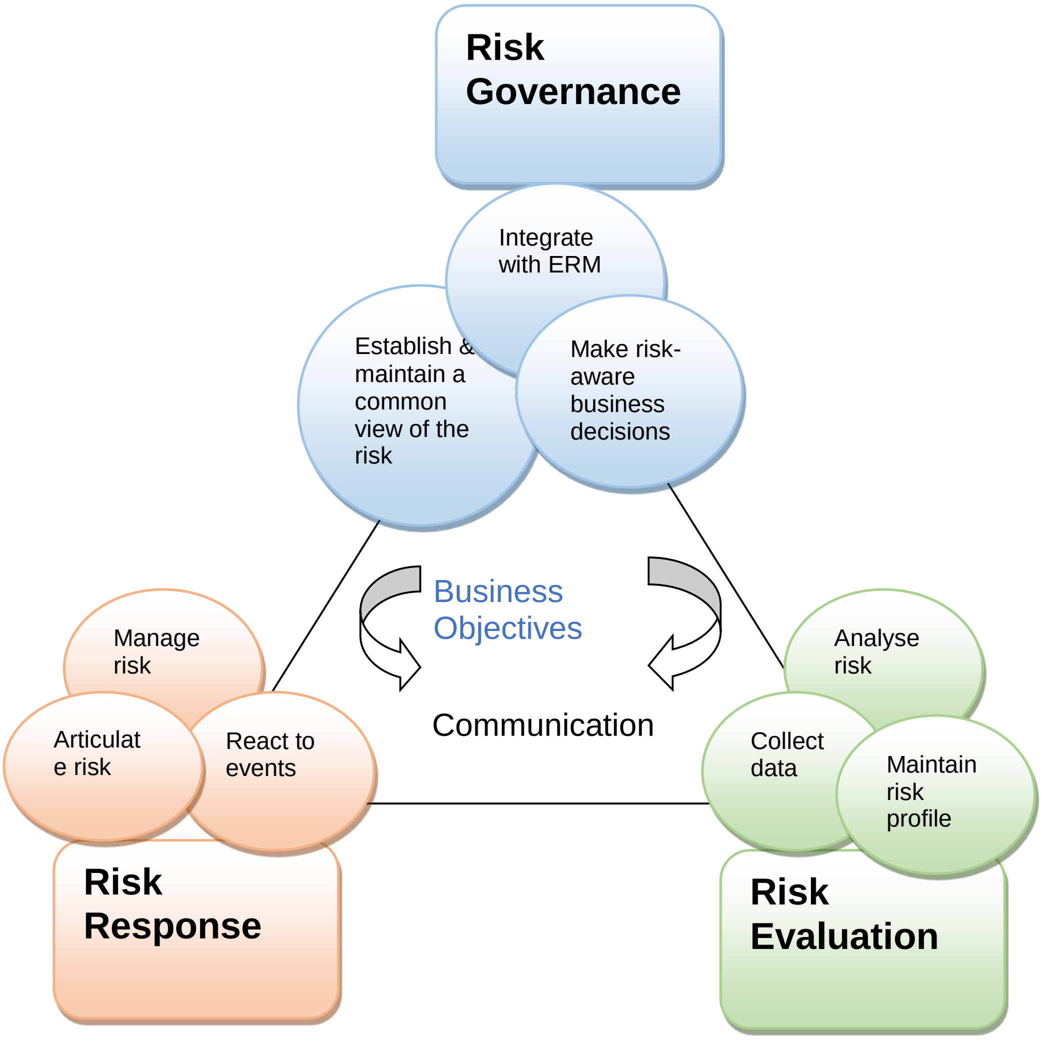
Risk Response

The purpose of a risk response is to address IT risks in a cost-efficient way and according to the organisation's priorities. The essential processes in this domain of the risk IT framework include risk management, reaction to risks, and risk articulation (Svata & Fleishmann 2011). This step encompasses the definition of a risk response and identification of the key performance indicators (KPIs) based on project objectives. The KPIs indicate whether an organisation is likely to face a risk that outstrips the established risk appetite. The choice of the KPIs is dependent on micro and macro environment factors, the size of the organisation, and the prevailing regulatory regime (Svata & Fleishmann 2011). The KPI selection process should involve stakeholders to achieve buy-in and support. Further, the selection should involve consideration of the major performance indicators and root causes.

The selected KPIs must meet the following criteria: optimal business impact, high sensitivity, and reliability (Claudia, Tehler & Wamsler 2015).

The reason for providing a risk response definition is to align the identified risk with the established risk appetite (Claudia, Tehler & Wamsler 2015). This implies that defining a response will ensure potential residual risk falls within the acceptable tolerance threshold. The possible risk response options include avoidance, reduction/mitigation, sharing/transfer, and acceptance. The choice of the risk response option depends on its cost (capital, wages, and operational costs), the significance of the risk as shown in a risk map, the efficacy and efficiency of the response, and the organisation's capacity to execute the response (Hooper 2014). Therefore, an entity should prioritise the response options based on the above criteria and select the optimal risk response.

Figure 2.11 The Risk IT Framework



2.5 Issues learned from Literature:

The following table illustrates some issues have been raised in literature and some research gaps and the relevant emerged research questions:

Issues raised in literature	Theoretical argument	Research gaps	Emerged Research questions
Stakeholders or actors in risk governance	An important theme emerging from the frameworks reviewed relates to the stakeholders	Although the frameworks reviewed specify the key steps in risk governance, the	- Who are the specific stakeholders or actors involved in

	involved in public or private sector organisations. Good risk governance depends on how relationships/interactions among the stakeholders are harnessed into collective actions in risk identification, assessment, analysis, response, and monitoring (Arena, Arnaboldi & Azzone 2010). Different stakeholders are mentioned in the frameworks in the context of the public sector, including national/local government, the private sector, civil society, communities, etc.	description of the actors or stakeholders and their interactions in risk management is limited.	risk governance in the public sector? - What are the stakeholder relationship dynamics or interactions inherent in risk governance, especially risk decision-making processes? - How does positive or negative power dynamics affect risk decision processes?
The appropriate risk appetite based on the risk	The frameworks reviewed (OCC, REPM, ERM) affirm that the risks an	Given that any risk process should consider the risk/return	- What is the risk appetite threshold that a public-

capacity of an organisation	organisation is willing to take should not exceed its risk appetite (IIA 2013). It requires a confirmation of financial implications of a particular risk strategy, possible constraints during execution, and risk integration into strategic planning. These elements constitute a firm's risk capacity.	tradeoffs, it becomes evident that the risk appetite threshold should exceed an organisation's risk capacity. It is not explicitly explained as to what extent the risk appetite should exceed the risk capacity to realise the full benefits/opportunities of a risk, while safely avoiding its negative impacts.	sector organisation can establish to profit from identified risks without experiencing dismal surprises? - What level of uncertainty can public sector organisations accept in exchange for risk advantages given their altruistic/societal foundations?
Risk communication and reporting	Communication, as a critical component of risk governance, recurs in most of the frameworks reviewed – IRGC, modified IRGC, ERM, and Risk IT frameworks. Effective communication	One main challenge with risk communication and reporting that is lacking in literature is how to identify and meet the expectations of the stakeholders	- How can meaningful interactions among stakeholders with different backgrounds be realised in the

	is essential in risk governance activity (Renn 2011). The intent of risk communication and reporting is to educate and inform stakeholders to achieve trust in the process. Good risk reports by the board or the management lead to enhanced risk transparency.	through the communiqué or risk reports. Given the diversity of backgrounds of the stakeholders, misjudgements in communications can cause mistrust that can hamper responsible governing of risks.	context of public investment projects? - What specific elements should be included in risk reports to support information flows that are consistent with the diverse risk interpretations?
Embedding a positive risk culture in the organisation	One area that has been the focus of the studies reviewed is the establishment of a risk culture in the organisation. It is noted that a consistent risk culture across the organisation is a critical aspect of risk governance: it ensures that operations or decisions fall within the established risk thresholds or appetite (IFC 2012;	In the literature reviewed, the common assumption is that risk culture is an intangible aspect of risk governance. This makes it difficult to measure improvement in risk culture or change from the baseline. Further, it is not clear from research the indicators of a	- What set of leadership interventions should be considered to cultivate new risk mind-set and culture in public organisations? - What assessments or measurements can be used to

	Polk 2014). Certain leadership activities, such as risk anticipation, can help change mindsets to cultivate a positive risk culture.	positive risk culture in organisations.	determine an organisation's risk culture?

Table 2.1 issues learnt from literatures

2.6 Summary

In this chapter, a systematic review of scholarly literature on risk governance has been done. Although risk governance definitions vary widely, they all feature multi-actor involvement and transparency/accountability principles. It can be conceptualised as multi-stakeholder network/process for evaluating and managing public risks. Risk governance provides a framework for the involvement of all actors in responsible management of risk problems. The major risk governance frameworks reviewed in this research include the Brown and Osborne's (2013) model for public service innovation, IRGC model, modified IRGC framework. Risk governance is a cyclic process comprising five interconnected phases that culminate in an optimal risk management option for an identified risk. The adopted risk governance approaches in public service organisations in countries such as the UK focus on the institutionalisation of risk analysis tools to support policy/decision rationales and accountability. The identified issues of risk governance in the public/government sector include the communication/inclusion of multiple stakeholders, multidisciplinary knowledge/experience integration, routines, and flexibility of regulatory approaches.

The review has examined eight existing frameworks of risk governance in various sectors. The first one is the Brown and Osborn's (2013) framework, which is applicable in the public-sector innovation. It links technocratic, decisionistic, and transparency to different possible formulations of innovation, i.e., evolutionary, expansionary, and total innovation. Evidently, this framework is too simplistic to cater for the diverse multi-actor processes involved in public sector risk governance. The second framework reviewed is that provided by the IRGC. Its five phases – pre-assessment, appraisal, characterisation and evaluation, management, and communication – provide a foundational theoretical lens for risk governance across all sectors. However, clearly, the framework is too linear to reflect the iterative and integrated nature of public sector decision-making. Nevertheless, it provides a good starting point for the development of a more integrated framework of risk governance. To avoid the problem seen in the earlier IRGC model (linearity), the modified IRGC framework by Renn, Klinke, and van Asselt (2011) involves a cyclic process. It also introduces the element of multi-actor inclusion in the pre-estimation stage.

The problem seen in the IRGC framework also occurs in the OCC's framework, which is meant for corporate risk governance in banks. This framework involves additive steps of establishing a risk management system, risk appetite, and risk culture that proceed in a logical sequence. In contrast, the IPCC model highlights a host of activities for reducing natural risks and managing residual risk events. The REPM framework centres on value creation for the organisation through oversight/planning, business-level planning, operational execution, and monitoring and compliance of corporate risks. In contrast, the ERM framework focuses on the unit-level and entity-level business risks that threaten a firm's operations. The risk IT framework gives integrated activities for risk governance, risk evaluation, and risk response to help organisations make risk-aware decisions.

Four key issues or themes emerge from the literature reviewed. The first one is the diversity of stakeholders and breadth of their interactions in a public risk environment. The appropriate risk appetite for organisations is another issue evident in literature. Effective risk communication/reporting that reflects the diversity of stakeholder backgrounds and interpretations is another key issue in this research. Finally, the challenge of embedding a new risk mind-set or culture comes up as a significant issue in risk governance literature.

Chapter 3: Literature review II: the role of Internal Audit Function in governance assurance

3.1 Introduction

In today's business environment that is characterised by rapid economic globalisation and the stricter legal landscape, organisations are forced to review their strategy periodically to manage financial and non-financial risks to thrive. These conditions also demand a redesign of organisational structures, processes, and systems in a project context. Efficient management of risks in organisations is crucial for firms to navigate increasingly complex uncertainties, including natural disasters and fraud risks (Dafikpaku 2011). Corporations control risks as a routine business operation. However, to withstand growing economic globalisation waves, it is essential for both public and private institutions to adopt effective mechanisms for risk identification, assessment, and response.

The internal audit function evolved from risk governance to strengthen a firm's financial risk management practices (Huibers 2013). Organisational stakeholders would want an efficient internal process for managing uncertainties, as opposed to depending solely on external audit reports. They also require regular information about the performance of the firm to inform their investment decisions. The risk-based audit function is meant to enable organisations to meet stakeholder interests, thrive in a rapidly changing business environment characterised by financial uncertainties, and respond to market and regulatory requirements (Burton et al. 2012). The aim is to enhance enterprise-wide operational efficiency to minimise risk, support financial reporting, and avoid failures (Huibers 2013).

From this background, it is clear that the risk-based approach to internal control influences risk governance. The efficient evaluation of departments or units can uncover control weaknesses that expose the organisation to risk. Results from surveys of auditors as respondents can help strengthen risk management processes, such as error detection and fraud discovery (Ravindran et al. 2015). The process ensures that financial statements are accurate and reliable. Auditing is a standard practice for preventing accounting fraud risk in organisations. Further, a risk-based audit can reveal risks with a considerable impact on financial reports (Ravindran et al. 2015). Subsequently, a significant management focus is directed towards those areas.

Financial uncertainties often arise from organisational records and change management. Businesses face constant pressure to innovate and remain competitive. As a result, they must manage change internally to control new risks. Proactive risk management of an organisation's financial and nonfinancial information is critical during the transition period. Such an approach will result in an efficient decision-making process in all areas, including records management (Huibers 2013). Therefore, a coherent risk governance policy can ensure that departmental heads cooperate, particularly when implementing mitigation measures to preserve financial/nonfinancial information.

This chapter reviews the relevant literature on risk-based audit processes in public sector projects. The fundamental element examined is the internal audit function in the context of risk governance. The chapter involves a synthesis of existing knowledge in this area. Because of the significance of the internal audit in risk governance, this review begins with a definition of the internal audit function and its role in the public sector, organisational projects, and governance assurance. The analysis clarifies the elements of a maturity model developed in the previous chapter, including strategy, risk appraisal and insights, risk decisions and implementation, etc.

3.2 The Internal Audit Function

A fundamental practice in good corporate governance is internal auditing. It gives a clear position on a firm's risk control mechanism to the board, Chief Executive Officers, and senior management to help strengthen risk management. The Institute of Internal Auditors [IIA] (2014) defines internal auditing as "an independent, objective assurance and consulting activity designed to add value and improve an organisation's operations" (para. 4). The chief audit executive leads this risk-based function. It enables an enterprise to meet its objectives through a systematic and efficient evaluation and response to financial and non-financial risk control issues. In this view, internal audit is an objective and confirmatory process that brings value to the firm and helps streamline management processes (IIA 2014). From this definition, it is clear that this function is intertwined with management or board follow-up activities in the corporate governance framework. A system of institutional accounting controls ensures that all transactions are recorded in strict adherence to the set guidelines to aid financial reporting and accountability.

Internal audit plays a crucial role in the public sector. A survey by Ravindran et al. (2015), which involved 90 chief audit executives in the UAE, revealed that 82% of them perform risk governance functions of assurance, consulting, or support in their institutions. Internal audit is a critical pillar of good public-sector governance. In general, public sector auditors play assurance, participative, and consultative roles. By offering independent and objective reports on whether the management of public resources is done responsibly, they assist institutions or agencies to attain "accountability and integrity, improve operations, and instill confidence in the citizens" (The Institute of Internal Auditors [IIA] 2013, p. 5). In this regard, the audit function supports governance obligations of oversight by determining if government agencies or departments are performing their tasks and flag up scandals. It also provides policymakers with advisory services developed through an objective evaluation of projects and operations in the public sector. Lastly, internal auditing detects trends and challenges for timely interventions.

In projects, the traditional role of the internal audit unit is assurance (Huibers 2013). However, it can have generic responsibilities, such as consultative and participative functions as well if there are adequate safeguards. The consulting services include quality assurance, i.e., advising the program managers on project milestones, analysis of risks and controls, championing change management, and designing and facilitating training/workshops (Al-jabali, Abdalmanam & Ziadat 2011). The participative responsibilities include providing technical expertise and documentation controls and project coordination. Some fundamental preconditions that must be met for internal audit to perform consulting or participative functions include the management should be responsible for project risks and appetites, the audit committee must approve its roles, the auditors should not be involved in the implementation of risk solutions or responses, etc. (Huibers 2013).

As aforementioned, the traditional function of internal audit is project governance assurance, which encompasses program reviews. This role occurs at four levels: initial project, milestone reappraisals, business readiness assessment, and post-implementation evaluation (Hubers 2013). The reports also focus on program deliverables and the effectiveness of internal controls. In this way, the senior management is assured that the risks are maintained at acceptable levels. In ERM, the internal audit team gives assurances on the effectiveness of risk governance processes, controls, and assessment and reporting (Florea & Florea 2016).

3.3 Development of a Maturity Model for Risk Governance Audit in public sector

The maturity model developed in this research is intended to give a framework for the auditing risk governance. Internal audit activities are important in identifying cases of non-adherence to the risk governance framework by the staff across all departments. The adopted maturity model comprises of five interrelated domains: strategy, risk appraisal and insights, risk decisions and process implementation, risk management and governance, and review of risk development and decisions. Just like in the IRGC framework, risk communication occurs throughout the five phases of this model. This requires public organisations to establish a risk culture, adequate financial and technical capacity (resources), appropriate risk appetite levels, and risk ownership. The model is based on existing frameworks, namely, Integrated ERM model, the modified IRGC model, and the OCC's framework. The description of each domain and its determinants is given below.

3.3.1 Strategy: make sense of the present and explore the future

Strategy, as a concept, has military origins. It is what links policy and tactics used in combat. In business, a strategic plan is the means that an entity employs to counter the rivals' moves. Nickols (2016) explores different meanings of the term 'strategy' as used in literature and presents three conceptual definitions. First, strategy refers to any action by the senior management that is critical to the organisation. Second, it encompasses fundamental directional decisions with specified goals. Third, it comprises particular operations essential in realising both short-term and long-term organisational objectives. In other words, it responds to questions about what the firm should be doing, what goals it seeks to accomplish, and how to meet them.

A strategy is a critical element of the enterprise risk management (ERM) framework. It is combined with another concept – risk appetite – to form the third domain or dimension of the model. Organisations with a risk-taking culture often outline the acceptable risk levels and the specific benefits of each risk to inform strategy (Frigo & Anderson 2011). They define the risk appetite based on the risk capacity and market conditions. A strategic plan communicates the organisation's policy on those risks it is willing to embrace or own to stakeholders (Brodeur et al. 2010). Risk management is integrated into organisational planning to support the overall strategic direction and operations. According to Brodeur et al. (2010), the integration of risk management into organisational strategy is a best practice in ERM.

Previous research by IIA has shown that the listed companies in the financial sector have strict regulatory requirements to set up proper risk management function in the companies and force them to comply the regulations. However, the regulatory bodies don’t force public sector to comply with this regulation therefore it is important to demonstrate the board and top management the value of risk management and to adopt in order to secure the support from top. (IIA research report 2015)

The following table 3.1 depicts the extracted variables of Strategy domain.

<table>
<tr><th>Variables</th><th>References</th></tr>
<tr><td>existence of process to align risks with strategic objectives</td><td rowspan="6">Curtis, P & Carey, M 2012, Risk assessment in practice, Committee of Sponsoring Organizations of the Treadway Commission, Durham.

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Huibers, CJ 2013, ‘The role(s) of the auditor in projects: proactive project auditing’, The EDP Audit, Control, and Security Newsletter, vol. 47, no. 5, pp. 1-14.

IIA Norge 2017, Guidelines for the risk management function, IIA Norge, Oslo.
International Finance Corporation [IFC] 2012, Standards on risk governance in financial institutions, International Finance Corporation, Washington DC, Washington.

Ng, S 2015, ‘Governance beyond the government: responding to a reactionary flood governance regime</td></tr>
<tr><td>Existence of identification process of potential risk</td></tr>
<tr><td>existence of process for alignment of risk profile with business and capital management plans</td></tr>
<tr><td>existence of procedure for integrating the risk management into strategic decision making</td></tr>
<tr><td>existence of financial crisis impact drives to implement risk management program</td></tr>
<tr><td>existence of risk management oversight body</td></tr>
</table>

existence of mechanism for understanding and enforcement of risk practices by board	in Ayutthaya, Thailand', *Habitat International*, vol.52, no. 1, pp. 11-19 PricewatershouseCoopers [PWC] 2015, *The alignment challenge: how strategic is your ERM program?*, viewed 11 May 2017. van Asselt, M & Renn, O 2011, 'Risk governance', *Journal of Risk Research*, vol. 14, no. 4, pp. 431-449.
existence of process for compliance with regulatory requirements	
existence of internal audit process to implement formal risk management program	

Table 3.1 Variables of Strategy determinant of Risk Governance Auditing Framework

3.3.2 Risk Appraisal and Insights

The risk assessment process begins with risk identification. This step generates a list of all risks that an organisation is exposed to and related opportunities (Aven 2016). Most firms have risk identification mechanisms for identifying and appraising risks unique to their industry or sector, in addition to naming the significant threats, the process should create risk categories, such as financial, operational, etc. (Cox 2012). They develop an annual risk report that lists the most significant risks and their respective likelihood of occurrence and impact. Based on the IRGC framework, facts and assumptions pertaining to a particular risk are determined during the risk appraisal phase. The process entails estimating the probability and impact of each identified risk (Bernado 2016). A risk appraisal process should be comprehensive in order to capture not only the main risks, but also their root causes or risk drivers. Prokopenko and Bondarenko (2012, p. 24) state that the presence of a clear taxonomy of operational risk terms guarantees consistency in "risk identification, exposure rating, and management objectives".

The risk insight and foresight in relation to threats to firm operations. It gives an organisation the ability to map or delineate the potential impact and probability of a risk related to a specific activity or operation. The probability of occurrence may range from low (unlikely) to very high (almost certain) while the impact of the risk could be minor, moderate, major, or critical. The impact and probability of occurrence of a risk linked to a project objective/outcome should be scored to allow risks to be compared. The key methods firms can use to map out and prioritise risks inherent in project objectives/outcomes at the board level include scenario testing, indicators, and stress tests (McKinsey & Company 2013). The assessment of risks entails assigning numeric values to every factor. This process involves two stages: a preliminary screening using qualitative methods followed by a quantitative evaluation of critical risks. the quantitative methods involve numerical ratings, while the qualitative ones require descriptive scales (Curtis & Carey 2012).

The dynamic nature of the business environment means that risks are always evolving. As such, organisations must continuously recalibrate their risk assessment mechanisms to reflect these changes. Methods such as scenario analysis are intended to support strategy by anticipating risks and linking them to the objectives (Goodson, Mory & Lapointe 2012).

The following table 3.2 depicts the extracted variables of Risk appraisal and insight domain.

<table>
<tr><th>Variables</th><th>References</th></tr>
<tr><td>existence of risk identification mechanism</td><td rowspan="8">Aven, T 2016, ‘Risk assessment and risk management: review of recent advances on their foundation’, European Journal of Operational Research, vol. 253, no. 1, pp. 1-13.
Bernado, D 2016, Risk analysis and governance in EU policy making and regulation: an introductory guide, Springer International Publishing, Geneva, Switzerland.
Brodeur, A, Buehler, K, Patsalos-Fox, M & Pergler, M 2010, ‘A board perspective on enterprise risk management’, McKinsey Working Papers on Risk, vol. 1, no. 18, pp. 1-22.
Cox, LA 2012, ‘Confronting deep uncertainties in risk analysis’, Risk Analysis, vol. 32, no. 10, pp. 1607-1629.
Curtis, P & Carey, M 2012, Risk assessment in practice, Committee of Sponsoring Organizations of the Treadway Commission, Durham.
Goodson, SG, Mory, KJ & Lapointe, JR 2012, Supplemental guidance: the role of auditing in public sector governance, 2nd edn, The Institute of Internal Auditors, Boston, MA.
IIA Norge 2017, Guidelines for the risk management function, IIA Norge, Oslo.
International Finance Corporation [IFC] 2012, Standards on risk governance in financial institutions,</td></tr>
<tr><td>existence of mechanism for risk depository including vocabulary for risk types</td></tr>
<tr><td>existence of guidelines for prioritization of risk management and control</td></tr>
<tr><td>existence of control framework calibrated in line with risk appetite</td></tr>
<tr><td>existence of guidelines for quantified of tolerance for loss or negative events</td></tr>
<tr><td>existence of quantitative risk assessment criteria</td></tr>
<tr><td>Existence of qualitative risk assessment criteria</td></tr>
<tr><td>Existence of process for regular quantification and aggregation of risks</td></tr>
</table>

existence of mix qualitative and quantitate risk assessment criteria	International Finance Corporation, Washington DC, Washington. Prokopenko, Y & Bondarenko, D 2012, *Operational risk management: best practice overview and implementation*, IFC, Tirana.
existence of mechanism for frequent updating the risk assessment	

Table 3.2 Variables of Risk appraisal and insight determinant of Risk Governance Auditing Framework

3.3.3 Risk Decisions and Process Implementation

The quality of internal controls and decisions are the hallmarks of a robust risk governance process. As such, risk must be integrated into all business or project decisions as opposed to pursuing compliance-related goals (Beckers et al. 2013). Effective risk governance requires the integration of various risk considerations and trade-offs to realise project objectives/outcomes at minimal risk exposure (Hopkin 2012). From an audit perspective, the key considerations in assessing risk-related goals and process implementation and compliance with the framework include grounding the risks in all business decisions, whereby, decision-makers base their plans on assumptions about the uncertainties associated with specific project objectives/outcomes (Ward & Chapman 2011). This normative approach entails identifying the risks, estimating their likelihood of occurrence, effects, and outcomes, choosing a path to pursue to accept or avoid them, and designing effective responses (Beckers et al. 2013).

Decision trees can be utilised to express the full extent and complexity of the variables and premises involved and optimise risk-based decisions. This approach requires that risk optimisation measures be embedded in strategic decisions – through evaluation, reports, and mitigation – before execution (Carawan 2016). According to United Nations Economic Commission for Europe [UNECE] (2012), strategic decisions or choices must be anchored in “risk transparency and insight” and must reflect the organisation’s risk appetite (para. 13). Therefore, the auditing process should evaluate the accuracy of the assumptions included in the strategic plan, the acceptability of risks owned or transferred as planned, and the appropriateness of the risk-return trade-offs. In this regard Risk models can be used to simulate hypothetical risk situations to support business decisions.

The following table 3.3 depicts the extracted variables of Risk Decisions and process implementation domain.

<table>
<tr><th>Variables</th><th>References</th></tr>
<tr><td>Existence of procedure for grounding of risk in all business decision</td><td rowspan="4">Beckers, F, Chiara, N, Flesch, A, Maly, J, Silva, E & Stegemann, U 2013, ‘A risk-management approach to a successful infrastructure project: initiation, financing, and execution’, McKinsey Working Papers on Risk, vol. 1, no. 52, pp. 1-18.
Beckers, F, Chiara, N, Flesch, A, Maly, J, Silva, E & Stegemann, U 2013, A risk management approach to a successful infrastructure project: initiation, financing, and execution, McKinsey & Company, New York, NY.
Carawan, M 2016, Risk governance framework: assessment and reporting, viewed 23 January 2018,
Hopkin, P 2012, Fundamentals of risk management: understanding, evaluating and implementing effective risk management, Kogan Page Publishers, London.
United Nations Economic Commission for Europe [UNECE] 2012, Risk management in regulatory frameworks: towards a better management of risks, viewed 23 January 2018,
Ward, S & Chapman, C 2011, How to manage project opportunity and risk: why uncertainty management can be a much better approach than risk management, 3rd edn, John Wiley & Sons, Hoboken, NJ.</td></tr>
<tr><td>Existence of mechanism for embedding risk optimization in strategic decision</td></tr>
<tr><td>Existence of procedure for executing core business process and operations based on risk consideration</td></tr>
<tr><td>Existence of simple risk model as support business for decision</td></tr>
</table>

Table 3.3 Variables of Risk decision and process implementation determinant of Risk Governance Auditing Framework

3.3.4 Risk management and Governance

The formalisation of risk considerations in decision-making involves systems of accountability that reinforce risk-based behaviour in the organisation (Brodeur et al. 2010). The board has an oversight role in risk management and governance. From the integrated ERM programme framework, risk management and governance is seen in how the board works with line managers and risk officers in a project to address specific risks. It is the organisational ERM model for optimising all risk types through risk reports, evaluation, and mitigation (Carawan 2016).

The board's role in risk oversight covers the assessment of various risks through interactions with the risk committee and line managers (Pergler 2012). Curtis & Carey (2012) mention that Risk-minded directors lead discussions on risk issues and ensure that the ERM function is well facilitated and has the right skills and technology to monitor risks and execute effective responses. They also disapprove bureaucratic processes that impede board-risk committee interactions.

Therefore, when auditing the risk governance structure of a firm, the focus should be on who is responsible for risk oversight. In most firms, the senior management considers risk oversight a sole responsibility of the audit committee of the board. However, this perspective fails to take into account the significance of risk oversight to a firm's performance (Pergler 2012). It is also indicative of the casual manner in which risk processes are handled by the firm.

The involvement of directors in risk evaluation is the hallmark of oversight. The board should hold a discussion of risk and develop the risk management policy that all employees should follow. On the contrast, Regulatory requirements to adopt risk management practices exist in the banking, securities, and insurance sectors. Firms operating in these industries are required to utilise risk management tools, policies/procedures, quantitative risk measurements, acceptable risk thresholds, and hedging strategies (Harle et al. 2015). Besides board involvement in risk processes, having a separate risk committee can help cultivate a risk aware culture in the organisation. However, even with a risk committee, the ultimate body charged with the role of risk oversight is the board. For this reason, the composition of the board is critical. A mix of backgrounds will help provide a diversity of views on the risks (Carawan 2016). Additionally, Mikes (2011) notes that career Chief Risk Officers (CROs) mobilise "concepts, frameworks, technologies, risk models, and interpretations" to define, assess, and manage uncertainties (p. 10). Therefore, they play a critical role in decision-making and risk control.

The presence of firm-wide policies helps specify an organisation's formal approach to addressing risks and provide guidelines for staff role definition, risk communication, whistle-blowing, ethical conduct, internal risk control, accountability and ownership levels, and internal audit for assurance purposes. All these factors represent a structure of boundaries and standards dictating risk-taking in an organisation. Another component of institution-wide policies of a risk-based organisation includes internal controls for tracking and reporting risks (Reding et al. 2013). It encompasses factors such as risk function, risk treatment plans and response strategies, identification, assessment, and prioritisation strategies, risk indicators, regular bottom-up risk communication, formal risk oversight, and fraud risk evaluation.

The following table 3.4 depicts the extracted variables of Risk management and governance domain.

<table>
<tr><th>Variables</th><th>Reference</th></tr>
<tr><td>existence of risk management policies and procedures</td><td rowspan="10">Brodeur, A, Buehler, K, Patsalos-Fox, M & Pergler, M 2010, 'A board perspective on enterprise risk management', McKinsey Working Papers on Risk, vol. 1, no. 18, pp. 1-22.
Carawan, M 2016, Risk governance framework: assessment and reporting, viewed 23 January 2018,
Curtis, P & Carey, M 2012, Risk assessment in practice, Committee of Sponsoring Organizations of the Treadway Commission, Durham.
Harle, P, Havas, A, Kremer, A, Rona, D & Samandari, H 2015, The future of bank risk management: McKinsey working papers on risk, McKinsey & Company, New York, NY.
Mikes, A 2011, From counting risk to making risk count: boundary-work in risk management: working paper 11-069, Harvard Business School, Boston, MA.
Reding, KF, Sobel, PJ, Anderson, UL, Head, MJ, Ramamoorti, S, Salamasick, M & Riddle, C 2013, Internal auditing: assurance & advisory services, 3rd edn, The IIA Research Foundation, Boston, MA.
Pergler, M 2012, 'Enterprise risk management', McKinsey Working Papers on Risk, vol. 1, no. 40, pp. 1-17.</td></tr>
<tr><td>existence of support and sponsorship of the risk management by the board and executive</td></tr>
<tr><td>existence of formalized approach to addressing risks</td></tr>
<tr><td>existence of guidelines for definition of role and responsibilities of risk staff</td></tr>
<tr><td>Existence of ethics and code of conduct policies</td></tr>
<tr><td>existence of guidelines for risk internal control</td></tr>
<tr><td>existence of guidelines for definition of risk accountability and ownership</td></tr>
<tr><td>existence of guidelines for internal audit as assurance task</td></tr>
<tr><td>existence of risk function</td></tr>
<tr><td>existence of risk treatment plans and response strategies</td></tr>
</table>

existence of process for risk identification, assessment and prioritization	
existence of process for identification and monitoring key risk indicators	
existence of regulatory requirements to adopt risk management practices	
existence of Chief risk officer position	
existence of risk communication mechanism	
existence of whistleblowing mechanism	
existence of regular risk communication by board and senior management	
existence of formal risk oversight authority	
existence of procedure for fraud risk assessment	

Table 3.4 Variables of Risk management and governance determinant of Risk Governance Auditing Framework

3.3.5 Review of Risk Development and Decision

The conditions in which risk decisions are made are not static. New data or better options may arise, pushing organisations to reconsider earlier choices. Therefore, it is essential for the firm to review or amend the current risk management processes and decisions. Effectiveness evaluation may involve internal audit assurance to identify gaps in the RM framework (Verbano & Venturini 2011). The auditing of institutional RM guidelines or procedures would reveal the suitability of the existing model and areas that need enhancement. In addition, there is a need for an ongoing update of an organisation's risk assessment system to ensure it works according to ERM standards. Progress reports of the RM processes should be presented to the oversight committee for action (Verbano & Venturini 2011). The management-agreed continual improvement plan would enhance RM practices in the organisation.

The existence of independent quality assurance by a third party can also reinforce risk development and decisions. Such a function gives an advisory on the quality of the "internal control system" integrated into the operational processes based on a review of the project process and deliverables (Huibers 2013, p. 5). It is also important to define iterative mechanisms critical for the optimisation of the objectives. One such bottom-up approach involves guidelines for oversight by the board or audit committees. In this way, information from the reports by line managers (risk owners) can inform joint decisions on risk responses (Curtis & Carey 2012). Further, the monitoring and review of the RM framework generate data that can support strategic planning. If the model does not enable the organisation to meet the intended outcomes or objectives, then it should be amended to make it more useful. In addition to that the international standard recommends that the organisation should develop the risk management framework and implement it and it should be continuously improved. (ISO 31000)

The following table 3.5 depicts the extracted variables of Review of risk development and decision domain.

Variables	Reference
existence of process for monitoring and review of risk management framework	Curtis, P & Carey, M 2012, *Risk assessment in practice*, Committee of Sponsoring Organizations of the Treadway Commission, Durham. Huibers, CJ 2013, 'The role(s) of the auditor in projects: proactive project auditing', *The EDP Audit, Control, and Security Newsletter*, vol. 47, no. 5, pp. 1-14. Verbano, C & Venturini, K 2011, 'Development paths of risk management: approaches, methods and fields of application', *Journal of Risk Research*, vol. 14, no. 5, pp. 519-550.
existence of Internal Audit assurance framework for risk management	
existence of process for ongoing update of risk assessment	
existence of mechanism for independent assurance by third party	
existence of process for escalating and notifying the risk acceptance to the oversight authority	

existence of process for management and monitoring of risk exposures	
existence of documentation process	
Existence of guidelines for revision and reconstruction of risk management	
Existence of periodic reporting on risk to risk oversight authority	

Table 3.5 Variables of Review risk development and decision determinant of Risk Governance Auditing Framework

3.3.6 Risk Communication

Robust risk communication processes can add value to the RM function. Communication between the board and executive and line management is needed for the organisation to acquire a deeper understanding and insights into the potential risks (Nottingham 2014). Mechanisms that support risk communication across all levels can facilitate efficient risk identification, assessment, and response. Another critical component of effective risk communication is transparency. According to Huibers (2013), the board requires a thorough understanding of the risks to make sound decisions. Such clarity can only come from a culture that supports both upward and downward information flows.

The coordination of RM roles and duties across departments is another critical area of risk communication. In most organisations, the model adopted involves a central risk department that is well facilitated and staffed. In the UAE, most firms use teams or functions, such as the internal audit unit, to organise RM activity (Ravindran et al. 2015). The coordination of risk activities may also involve risk champions. This model is a pragmatic approach that is ideal for small to medium enterprises. It entails identifying risk champions in each department to oversee RM activities (Ravindran et al. 2015).

The communication must also involve risk awareness, which aims at increasing the recognition of risks, tolerance, and understanding of their impacts. It may include initiatives such as simulations, case studies, and mentorship (Jen 2012). Risk reporting efforts may also comprise internal communication processes, performance monitoring reports, risk registers, heat maps and dashboard, key indicators, and aggregated exposure documents. Organisations can use one or more of these methods to communicate risk. In the UAE, most firms use risk registers, heat maps/dashboards, and key risk indicators (Ravindran et al. 2015).

Nottingham (2014) outlines four factors necessary for an improved risk communication capability: clear risk governance roles, an integrated view of risks, risk appetite statement, and risk reporting and dialogue. Effective risk communication begins with clarity of risk governance structure. Firms should ensure that the allocation of roles is well defined at the board level and management level and the organisational structure facilitated risk dialogue (Nottingham 2014). Having an integrated view of risks enhances the understanding of the relationship between risk-return trade-offs and business objectives. It entails having a common "definition of risk, business objectives, value drivers, and strategy" relevant to the risks (Nottingham 2014, p. 5). A clear risk appetite statement also contributes to effective risk communication. It entails a quantitative and qualitative expression of the risks that a firm has decided to take. The statement promotes risk communication throughout the firm and informs interactions between the board and the management. Further, having a reporting structure that promotes risk governance in the organisation is important. This approach can help track organisational performance relative to the set risk appetite.

The following table 3.6 depicts the extracted variables of Risk communication domain.

Variables	Reference
existence of process to promote the Transparency	
existence of risk awareness initiative	
existence of procedure for internal communication of amount and type of risk to accept and manage or avoid	Huibers, CJ 2013, 'The role(s) of the auditor in projects: proactive project auditing', *The EDP Audit,*

existence of process for external communication to promote transparency and accountability	*Control, and Security Newsletter*, vol. 47, no. 5, pp. 1-14. Jen, R 2012, *How to increase risk awareness*, Project Management Institute, Vancouver. Johnson, DL 2017, *Statistical tools for the comprehensive practice of industrial hygiene and environmental health sciences*, 1st edn, John Wiley & Sons, Hoboken, NJ. Nottingham, L 2014, *Risk communication: aligning the board to c-suite*, Oliver Wyman, New York, NY. Ravindran, V, Ahmad, HI, Mohapatra, P & Choksy, S 2015, *A UAE perspective on non-financial institutions*, UAE Internal Audit Association, Dubai.
existence of guidelines for monitoring and reporting of performance against risks	
existence of risk register	
existence of risk heat map and dashboard indicates risk portfolio	
existence of key risk indicators report	
existence of aggregated quantitative risk exposure report	
existence of process for risk communication mechanism	
existence of guidelines of roles for coordinating risk management activity	
existence of guidelines for appointing risk champions from business unit	

Table 3.6 Variables of Risk Communication determinant of Risk Governance Auditing Framework

3.3.7 Risk Culture

Risk culture encompasses the values, capabilities, and behaviours that shape an organisation's risk governance practices and decisions (Polk 2014). It describes the norms of behaviour in an organisation that determine "the collective willingness to accept or take risks" and the capacity to understand and respond to company risks (McKinsey & Company 2013). From this definition, Organisations must take specific steps to cultivate risk-based practices. Risk culture can be attained by promoting accountability concerning the roles of the chief risk officer, audit executive, Chief Financial Officer, and head of compliance (Ravindran et al. 2015). A risk awareness program is also necessary to increase risk ownership, identification, and performance (Jen 2012). Such an initiative would also lead to better decisions due to more robust assessments based on accurate data.

Achieving a sustainable cultural change in the organisation may involve multiple strategies. Fostering understanding among employees on the accepted risks is one way of initiating a cultural change. The specific actions may include incident reviews to enhance employee understanding of the "risk errors and near misses" to build a positive risk culture (McKinsey & Company 2013). A second approach involves role modelling. Supervisors and peers can help set professional behaviour that involves considerations of risks in making decisions (McKinsey & Company 2013). Formal training of staff and the board on risk management will equip them with skills and competencies to behave or act differently when addressing uncertainties (Brodeur et al. 2010, Mckinsey & Company 2013). Cultural change can also be achieved through formal mechanisms like formalised risk escalation processes and the inclusion of aspects of risk in performance appraisals the approach will also ensure that risk thinking is incorporated into strategic planning and resource distribution.

The internal audit role can also promote risk culture. As Ravindran et al. (2015, p. 39) note, auditing gives "objective and independent assurance to the board" on the efficiency of RM and internal controls. It reveals the effectiveness of the risk management program, which helps enhance risk-based behaviour and practices.

Some boards sanction a risk culture audit to determine the status of the RM efforts. The findings not only give an independent assurance on RM processes but may also trigger a formal RM program in the organisation (Ravindran et al. 2015). As aforementioned, the development of talents and skills can also cultivate a risk culture. Tailored educational workshops or programs may be necessary to achieve this goal. Other strategies for attaining a risk culture in an entity include fostering risk understanding/conviction and training on fraud risks to increase awareness and ethical practices. Optimal risk oversight is crucial in preventing high-risk activities that may affect project objectives and outcomes. The leadership and commitment from the senior management is required to “translate risk strategy into operational objectives and assign management responsibilities in the organisation” (Beckers et al. 2013, p. 16).

The following table 3.7 depicts the extracted variables of Risk culture domain.

<table>
<tr><th>Variables</th><th>Reference</th></tr>
<tr><td>existence of guidelines for promotion the accountability</td><td rowspan="8">Beckers, F, Chiara, N, Flesch, A, Maly, J, Silva, E & Stegemann, U 2013, A risk management approach to a successful infrastructure project: initiation, financing, and execution, McKinsey & Company, New York, NY.
Beckers, F, Chiara, N, Flesch, A, Maly, J, Silva, E & Stegemann, U 2013, ‘A risk-management approach to a successful infrastructure project: initiation, financing, and execution’, McKinsey Working Papers on Risk, vol. 1, no. 52, pp. 1-18.
Brodeur, A, Buehler, K, Patsalos-Fox, M & Pergler, M 2010, ‘A board perspective on enterprise risk management’, McKinsey Working Papers on Risk, vol. 1, no. 18, pp. 1-22.
Jen, R 2012, How to increase risk awareness, Project Management Institute, Vancouver.
Johnson, DL 2017, Statistical tools for the comprehensive practice of industrial hygiene and environmental health sciences, 1st edn, John Wiley & Sons, Hoboken, NJ.
Polk, D 2014, Risk governance: visual memorandum on guidelines adopted by the OCC, Davis Polk & Wardwell LLP, New York, NY.
Ravindran, V, Ahmad, HI, Mohapatra, P & Choksy, S 2015, A UAE perspective on non-financial institutions, UAE Internal Audit Association, Dubai.</td></tr>
<tr><td>existence of guidelines for risk management training for board and staff</td></tr>
<tr><td>existence of process for risk culture audit</td></tr>
<tr><td>existence of program for development of talents and skills</td></tr>
<tr><td>existence of risk awareness program</td></tr>
<tr><td>existence of guidelines for internal audit role to promote risk culture</td></tr>
<tr><td>existence of formal training of fraud risk awareness and ethical culture</td></tr>
<tr><td>Existence of guidelines for fostering risk understanding and conviction</td></tr>
</table>

Table 3.7 Variables of Risk Culture determinant of Risk Governance Auditing Framework

3.3.8 Financial and Technical capacity

Financial and technical capacity is a crucial determinant of an organisation’s risk resilience. A mechanism for allocating adequate capital to address identified risks is a best practice in RM. Through resource allocation, the risk officer is given the green light to take specific risks that have specified returns (Brodeur et al. 2010, UNECE 2012). The investment choices involve trade-offs between the uncertainty and anticipated benefits. Flexibility is also an important consideration when making capital allocation decisions. Such choices form a critical part of a firm’s risk strategy.

The technical capacity leads to a useful risk appetite articulation, monitoring and reporting, and control (Deloitte 2014). In this regard, the ERM function must have individuals with analytical skills on RM and adequate understanding of the impact of their decisions on an organisation's risk profile (Curtis & Carey 2012). A mechanism for acquiring skills and management capabilities would determine a firm's technical capacity to address risks. The required competencies can be obtained through the training of staff and managers.

Organisations leverage on the expertise of the employees or risk owners to manage uncertainties. Therefore, human skills are critical in detecting and executing risk controls on a daily basis. In particular, the operational management – a critical unit of enterprises – has a supervisory function in the execution of risk mitigation measures by staff (IIA 2013). The availability of resources and risk technology would also affect a firm's financial and technical capacity. Human skills are not enough. Efficiency in risk management requires technology, including automation, to handle issues such as scenario analysis. Risk resilience in volatile economic conditions can also protect the firm from risks that fall outside the purview of its financial or technical capacity. Risk capacity depends on the financing decisions related to the project or operation. Financing decisions, including taking long-term loans, have a direct impact on the risk capacity of the organisation. A firm's financial structure determines its capital needs and cash flows. Thus, the focus of the audit should be on whether the board is knowledgeable about the risk ramifications of the financing decisions to the project objectives/outcomes (UNECE 2012).

The following table 3.8 depicts the extracted variables of Financial and technical domain.

Variables	Reference
Existence of mechanism for allocating adequate capital to deal with risk	Brodeur, A, Buehler, K, Patsalos-Fox, M & Pergler, M 2010, 'A board perspective on enterprise risk management', *McKinsey Working Papers on Risk*, vol. 1, no. 18, pp. 1-22.

<table>
<tr><td>Existence of mechanism for acquiring skills and management capabilities</td><td rowspan="4">Curtis, P & Carey, M 2012, Risk assessment in practice, Committee of Sponsoring Organizations of the Treadway Commission, Durham.
Deloitte 2014, Risk appetite frameworks: how to spot the genuine article, Deloitte Touche Tohmatsu, New York, NY.
International Institute of Auditors [IIA] 2013, IIA position paper: the three lines of defense in effective risk management and control, viewed 11 May 2017
United Nations Economic Commission for Europe [UNECE] 2012, Risk management in regulatory frameworks: towards a better management of risks, viewed 23 January 2018,</td></tr>
<tr><td>Existence of human skills</td></tr>
<tr><td>Existence of financial resources</td></tr>
<tr><td>Existence of risk technology</td></tr>
</table>

Table 3.8 Variables of Financial and technical capacity determinant of Risk Governance Auditing Framework

3.3.9 Risk Appetite

Risk appetite refers to the thresholds of risk – level and type – that the board can assume to realise organisational or project objectives (Brodeur et al. 2010, Polk 2014). According to ISO 31000 the risk appetite is “amount and type of risk that an organisation is prepared to pursue, retain or take” ISO (31000-2009). It allows decision-makers to accept risk levels that reflect the strategic direction they want to pursue. A risk appetite framework enables risk-takers in the organisation to assume risks consciously “within limits translating into the strategic objectives” (Deloitte 2014, p. 10). A risk appetite statement conveys to the staff amount of risks a firm decides to own in line with its strategy (Deloitte 2014). Employees must then apply these measures and limits in their day-to-day jobs. A firm’s risk capacity should be understood before setting these thresholds. It is determined using either Monte Carlo simulations or discrete scenarios (Brodeur et al. 2010). The risk appetite is increased or reduced depending on the company’s risk capacity and expected trade-offs.

The appetite limits should be reviewed periodically since industry and market conditions are always evolving. It entails an ongoing “process of understanding and judgment” that is responsive to the changes in “business, competitive, and control environments” (Deloitte 2014, p. 12). The new appetite levels should be cascaded down to the strategic objectives. Further, a frequent revision of risk appetite is required to align it with the new strategy. This framework gives the board and management with data on the appropriate threshold levels for the organisation. Thus, risk appetite information and tools should be aligned with the two tiers. Communication and reporting of the tolerance levels and limits can help trigger escalation and appropriate corrective action (Deloitte 2014). Further, risk-taking activities in the firm can be tied to strategic objectives through the integration of risk appetite into performance management.

The other determinant is new business approval, which should be captured in the risk appetite statement. The approval process should be rigorous and involve constructive dialogue between the senior management and risk management group. The internal audit unit should be strengthened to identify risks associated with new product/business process development, i.e., product development risk. The audit process should ascertain that firm operations occur according to the approved product development process to avoid related risks (Polk 2014).

The following table 3.9 depicts the extracted variables of risk appetite domain.

<table>
<tr><th>Variables</th><th>References</th></tr>
<tr><td>existence of risk appetite framework</td><td rowspan="8">Brodeur, A, Buehler, K, Patsalos-Fox, M & Pergler, M 2010, ‘A board perspective on enterprise risk management’, McKinsey Working Papers on Risk, vol. 1, no. 18, pp. 1-22.
Deloitte 2014, Aligning risk and the pursuit of effectiveness, efficiency and accountability: risk transformation, viewed 11 May 2017,
Deloitte 2014, Risk appetite frameworks: how to spot the genuine article, Deloitte Touche Tohmatsu, New York, NY.
Polk, D 2014, Risk governance: visual memorandum on guidelines adopted by the OCC, Davis Polk & Wardwell LLP, New York, NY.</td></tr>
<tr><td>existence of definition of risk appetite statement</td></tr>
<tr><td>existence of mechanism for understanding the current risk capacity</td></tr>
<tr><td>existence of periodic review of appetite limit with reference to evolving industry and market condition</td></tr>
<tr><td>existence of frequent revision of risk appetite in line with the change of strategy</td></tr>
<tr><td>existence of guidelines for alignment of risk appetite between board and business function</td></tr>
<tr><td>existence of guidelines for communication of risk appetite tolerance</td></tr>
<tr><td>existence of reporting process for any instances where the appetite and specific risk thresholds are reached</td></tr>
</table>

existence of process for integration or risk appetite into the performance management framework	

Table 3.9 Variables of Risk appetite determinant of Risk Governance Auditing Framework

3.3.10 Ownership

Not all employees can be responsible for risk management. ISO 31000 provides another clear definition of risk owner "person or entity with the accountability and authority to manage the risk". A risk owner is a person bearing the ultimate responsibility for managing uncertainties, e.g., the head of a business unit (Curtis & Carey 2012). His/her roles include identifying, measuring, tracking, and controlling risks (Curtis & Carey 2012). He/she also prioritises activities, creates risk awareness in the firm, and escalates problems that require board-level interventions.

Key considerations in ownership allocation are risk sources and the individual well positioned to understand and execute effective responses (Curtis & Carey 2012). Most risk-bearing organisations use a risk register to identify and assign potential hazards to the risk owners for management. Based on the causes, likelihood, and impact, individuals best placed to monitor and report risks are selected either from within or outside the firm for each business unit. Another dimension of ownership is accountability. All individuals from the board to the staff are responsible for risk management. However, the level of accountability varies between them. The ultimate responsibility remains with the Chief Executive Officer who "assumes ownership for all risks and reports to the board" (Dafikpaku 2011, p. 16). Risk officers, line managers, unit heads, and team leaders also have varying levels of accountability based on the objectives of the department (Dafikpaku 2011).

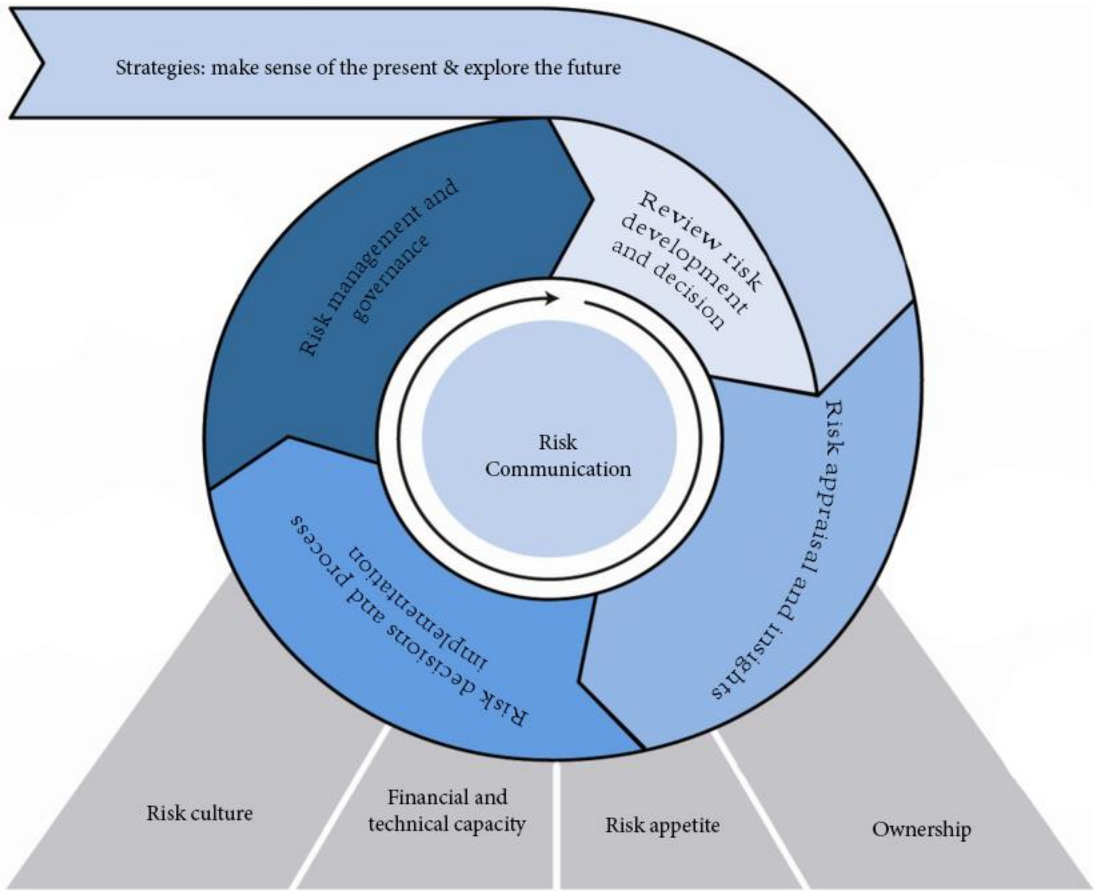
Having a risk management function as a standalone unit can help strengthen RM in the areas of responsibility of the risk owners. It supports the firm in the design and execution of efficient processes for risk identification, analysis, and treatment (IIA Norge 2017). It can also assist track an organisation's risk profile, detect potential threats, and convey risk information to the board and stakeholders (IIA Norge 2017). A risk team headed by the Chief Risk Officer plays a role in the coordination of risk activities. An internal audit function can also coordinate RM processes through "participation in risk facilitation activities" (Ravindran et al. 2015, p. 41). An organisation can also use risk champions or third-party professional service providers to achieve the same purpose.

The following table 3.10 depicts the extracted variables of risk ownership domain.

<table>
<tr><th>Variables</th><th>References</th></tr>
<tr><td>Existence of guidelines for risk ownership</td><td rowspan="7">Curtis, P & Carey, M 2012, Risk assessment in practice, Committee of Sponsoring Organizations of the Treadway Commission, Durham.
Dafikpaku, E 2011, The strategic implications of enterprise risk management: a framework, Society of Actuaries, Schaumburg, IL.
IIA Norge 2017, Guidelines for the risk management function, IIA Norge, Oslo.
International Finance Corporation [IFC] 2012, Standards on risk governance in financial institutions, International Finance Corporation, Washington DC, Washington.
Ravindran, V, Ahmad, HI, Mohapatra, P & Choksy, S 2015, A UAE perspective on non-financial institutions, UAE Internal Audit Association, Dubai.</td></tr>
<tr><td>Existence of guidelines for risk accountability</td></tr>
<tr><td>Existence of risk management function</td></tr>
<tr><td>Existence of risk team to coordinate risk activities</td></tr>
<tr><td>Existence of process for internal audit to coordinate and facilitate risk management activities</td></tr>
<tr><td>Existence of risk champions in business unit to coordinate risk activities</td></tr>
<tr><td>Existence of third party professional service provider for risk management activities</td></tr>
</table>

Table 3.10 Variables of Risk Ownership determinant of Risk Governance Auditing Framework

Figure 3.1: Maturity Model for Risk Governance in the Public Sector, source: author



3.4 Summary

The review of literature in this chapter has focused on the internal audit function and the determinants of the maturity model for good risk governance. The analysis clarifies a multiplicity of risk metrics, processes, practices, and standards used to address uncertainty and control the outcome. From the review, the board depends on audit findings to strengthen RM processes. The internal audit function in organisations plays three critical roles: participation, facilitation, and assurance. A firm's ERM capability can be improved through a robust risk strategy process, efficient risk identification and appraisal mechanisms, and data-supported decisions and responses.

It also requires robust risk management and governance structures that include formal decision-making channels, organisation-wide policies, management support, and CRO roles.

A review of risk development and decisions ensures continual improvement of ERM in line with strategic objectives. It also requires active risk communication to increase awareness and create a risk-based culture. The organisation's financial and technical capacity can be improved through staff training. Best practices in Risk Managment require that the risk appetite levels be adjusted periodically to reflect the firm's capacity and changes in market conditions. The organisation should allocate risk ownership to persons closest to the uncertainties/threats, such as unit managers.

Chapter 4: Literature Review III: effectiveness of Projects in Public Sector

4.1 Introduction

In the recent decade, the necessity for improvement in the functioning of governments has created the need for a reliable systemic approach. Currently, the approach universally accepted by governments is the creation of projects targeting specific issues and implementing recommended solutions. Understandably, the success of the described projects depends on the skills and expertise of staff members responsible for the implementation. In the public sector, the likelihood of success is further decreased by budgetary constraints and lack of consistent control. Finally, the increased demand for transparency and accountability characteristic for the sector requires the integration of respective practices, further complicating the matters.

In order to address the host of complications caused by these factors, various project management practices have been applied to the projects. Such a move allowed the project managers to utilize numerous readily available methodologies, instruments, and tools and incorporate measurement systems accepted as industry standards in the private sector. However, it has been pointed out by critics that the effectiveness of practices designed for for-profit organizations may not provide the expected improvement. The purpose of this literature review is to provide information on the principles of managing projects in the public sector, highlight important factors responsible for their success, define the roles of effectiveness and efficiency in the assessment process, outline approaches to risk management, and describe relevant processes.

4.2 Projects in Dubai

Since the 1970s, the Emirate of Dubai enjoyed rapid economic growth and modernization. Dubai itself became synonymous with unprecedented mega projects, with the investment of billions of dollars in massive infrastructure, real-estate and other related projects. While many of these projects were financed, developed, and built by the private sector, the lion's share of this economic activity indirectly belonged to the government. Most mega projects were undertaken by State-Owned Enterprises (SOEs) that were created and owned by the government of Dubai, most notably including Dubai Holding and Dubai World (Al-Malkawi & Pillai, 2013).

Before dwelling upon the discussion of primary characteristics of the government-supported enterprise projects in Dubai, it is essential to observe the concept of mega projects since it relates closely to the subject matter. Flyvbjerg (2014) defines mega projects as "large-scale, complex ventures that typically cost a billion dollars or more, take many years to develop and build, involve multiple public and private stakeholders, are transformational, and impact millions of people" (p. 3). This definition is considerably broad, yet it establishes the distinctive aspects of mega projects.

According to Flyvbjerg, Buzelius, and Rothengatter (2003), mega projects are not simply enlarged version of smaller projects. Instead, they are a new type of projects that have its distinctive characteristics in terms of management, risk, complexity, and stakeholder involvement. Also, one of the primary attributes of mega projects is that they do not fit in pre-existing patterns and standards of project development; instead, they set new standards and, on a larger scale, change the society and economy in global terms. Mega projects are a global trend that is implemented in such spheres as infrastructure, water and energy, information technology, industrial processing plants, mining, supply chains, enterprise systems, banking, defense, intelligence, air and space exploration, big science, urban regeneration (Flyvbjerg, 2014). Flyvbjerg (2014) also mentions Dubai's Burj Khalifa as the example of a very ambitious and successfully implemented mega project.

It is also of high importance to discuss the peculiarities of risk management in the context of mega projects. The study by Flyvbjerg (2011) focuses on the problem, which was mentioned previously in the thesis: the underestimation of various risks and uncertainties that could potentially lead to such adverse outcomes as cost overruns, benefit shortfalls, and completion delays. Additionally, Flyvbjerg (2011) mentions such factors of project underperformance as complexity, scope changes, as well as technological and demand uncertainty. However, the primary cause, which is often overlooked by numerous scholarly authors as well as project developers and stakeholders is the excessive optimism, which causes people to overlook the potential of uncertainty in various spheres of the project to influence its outcomes. In the context of mega projects, this assumption is also immensely applicable since such projects have increased levels of complexity and uncertainty. Thus, the implementation of government projects in Dubai should be assessed from this perspective as well.

The purpose of utilizing SOEs was to delegate the responsibilities of development and modernization to specialized entities that were capable of planning, financing, and executing huge projects both effectively and efficiently. While the SOEs of Dubai gained particular prominence as many of the projects were impressive in magnitude and profile, the reliance of governments on SOEs to plan, develop and implement projects in the Middle East was not new. An OECD report for example, states that despite the many failures of publicly-financed and SOE-managed projects worldwide and the Middle East, the experience of GCC economies, especially Dubai, with such structures has been successful, “having produced a number of profitable, and by most accounts, well-run public enterprises in a number of strategic industries” (*Middle East Banker*, 2012, p.1).

The OECD report (2012) identifies three major characteristics of SOEs in the GCC region that are relevant to financial risk management: insulation from politics, insulation from bureaucratic interventions in operations, and clear lines of command. These three characteristics are directly related to governance and indicate that SOEs were staffed by experts who enjoyed a substantial degree of freedom and independence to make decisions related to investment in major projects in line with the vision of the political leadership (*Middle East*

Banker, p.2). In Dubai for example, the portfolio of the Emirate's largest SOE, Dubai World, constituted of development and real estate projects, hospitality, investment, financial services, commodities, marine services, ports management and free-zones (Aubert, 2013).

By insulating SOE's from political and bureaucratic intervention and meddling, the government of Dubai empowered its SOEs and granted them a significant degree of independence as well as access to financial and other resources to ensure that projects were selected, planned, approved, and executed professionally and efficiently. Additionally, the clear line of command within each SOEs was intended to establish clear accountability and responsibility for performance (*Middle East Banker*, 2012).

Dubai's SOEs were hailed for their success as they were considered among the best run SOEs in the world and among the best run companies in the Emirate (*Middle East Banker*, 2012), and in principle, they were also supposed to insulate the government of Dubai from financial risks pertaining to their projects, an assumption that was put to the test during the financial crisis of 2009 (Al-Malkawi & Pillai, 2013).

During the 2000s, Dubai witnessed rapid economic growth and activity, much of which was fueled by the engagement of its SOEs in numerous costly projects. These SOEs were profitable as long as economic growth persisted and as long as prices continued to appreciate as a result of unwavering demand. This trend, however, was slowed down during the global financial crisis of 2007/2008 and the subsequent credit crunch and the liquidity shortages which hammered many world economies. Dubai's SOEs were suddenly faced with rapidly declining demand and high operational costs in the long term with no prospects for solvency in the short term. (Aubert, 2013).

Regarding similarities and differences between Dubai and other countries, several principal assumptions could be suggested. Primarily, as it is evident from the aspects of the Dubai's economic growth that were discussed in this section, Dubai is significantly different from other countries (Flyvbjerg, 2014). The implementation of mega projects is one of the most distinctive aspects that are to be mentioned (Flyvbjerg, 2011). It is apparent that other countries, such as the United States or Denmark, also implemented such projects. However, the use of SOEs has helped to advance the efficiency of their implementation considerably since the government of Dubai supported these projects financially (Flyvbjerg, 2011).

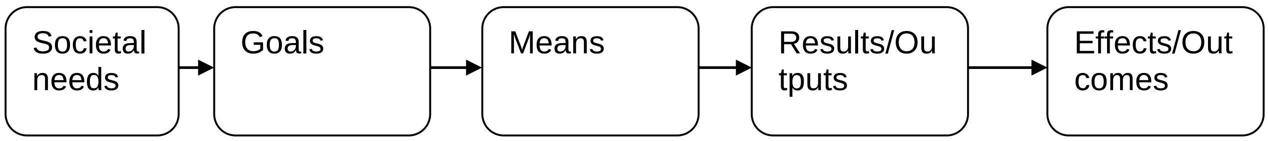
Despite the fact that examples of the government's support for large enterprise projects is not something entirely new, neither for the Middle East nor for Europe, the case of Dubai differs from the rest of similar projects by the fact that government did not involve in such projects in terms of politics and bureaucracy (Flyvbjerg, 2011). Considering similarities, it is possible to observe that Dubai's economy is also largely dependent on the state of the international economy. The global financial crisis exemplified this dependency evidently (Flyvbjerg, 2014). Therefore, it could be stated that Dubai represents a considerably unique example of collaboration between the government and enterprise project implementation, which differs in numerous ways from the majority of similar projects.

Currently, Dubai has become a centre of innovation. To keep up with the pace of change, the government allocates considerable resources for modernizing the public segment in accordance with stakeholder expectations (Ibrahim 2015). Currently, several such projects have already been successfully launched. The brightest examples include the software solutions in transportation, safety and security, and social activity domains (Buhumaid, Constantin & Schubert 2016). In addition, a number of initiatives exist in Dubai intended to further promote and streamline the development and implementation of projects in the public sector (UAE Government n.d.). Thus, it is necessary to establish a framework for the assessment of efficiency of projects in the public sector.

4.3 Effectiveness and Efficiency of Projects

Samset et al. (2016) give a fundamental logic of public projects from the identification of the societal need to the achievement of the desired effect. The actual needs of the citizens inform the development of a relevant project concept to address them. A relevant project is the one whose outcomes/deliverables are considered sustainable. As a result, the identification of the societal needs is the starting point of public project development. The formulation of objectives and goals/targets based on the identified needs is then done to guide the subsequent execution and monitoring of goal-oriented initiatives. This process is illustrated in Figure 10 below.

Figure 4.1 The Logical Model of Public Projects



In public investment projects, after formulating the goals, the means or strategies for achieving them are selected. In this case, efficiency in the translation of resources into outputs and the utilization of the outputs to attain a sustainable effect on the population is of utmost significance (PSGB 2012). In the front-end model, this process is referred to as project design. The actual utilization of the selected means or strategy occurs in the execution step, generating an output/result. In the public sector, the output could be an infrastructural product or a new system of citizen service delivery. The utilization of the output determines the project outcomes or deliverables.

The objectives of public sector projects are fundamentally different from those of private sector projects because the focus is not on financial returns, but rather on the public good or societal objectives (PMI 2013). Therefore, the overarching goal/objective of investment in public projects is to maximize the population of direct beneficiaries or citizens.

The definition of objectives/goals for a particular project utilizes the standards and the outcomes of a needs analysis of the stakeholders. As Cormican (2016) puts it, the process of defining the objectives requires a deep understanding of the needs and priorities of the people affected by the project. Logically, for public sector projects, the objectives/goals relate directly to the societal needs and effects. The societal needs can be identified in two main ways. The first one involves planning experts who review and assess the specific needs before describing and expressing them (Pulmanis 2015). The second approach entails the involvement of the citizens and other stakeholders in the identification of the needs, which are the prerequisite for the formulation of objectives. The first method is considered a classical public planning approach. Its main advantage is the efficiency or speed with which the needs are identified. It involves a quick needs analysis by experts based on accessible data. Therefore, the approach is entirely dependent on expert knowledge and scientific tools. In contrast, the involvement of stakeholders in the identification of needs and in the formulation of objectives is complex, more costly, and time consuming. However, the approach comes with multiple advantages, including enhanced communication, realistic assumptions, and well-aligned objectives (Pulmanis 2015). Stakeholder participation is considered a gold standard in the planning and execution of projects in the public sector.

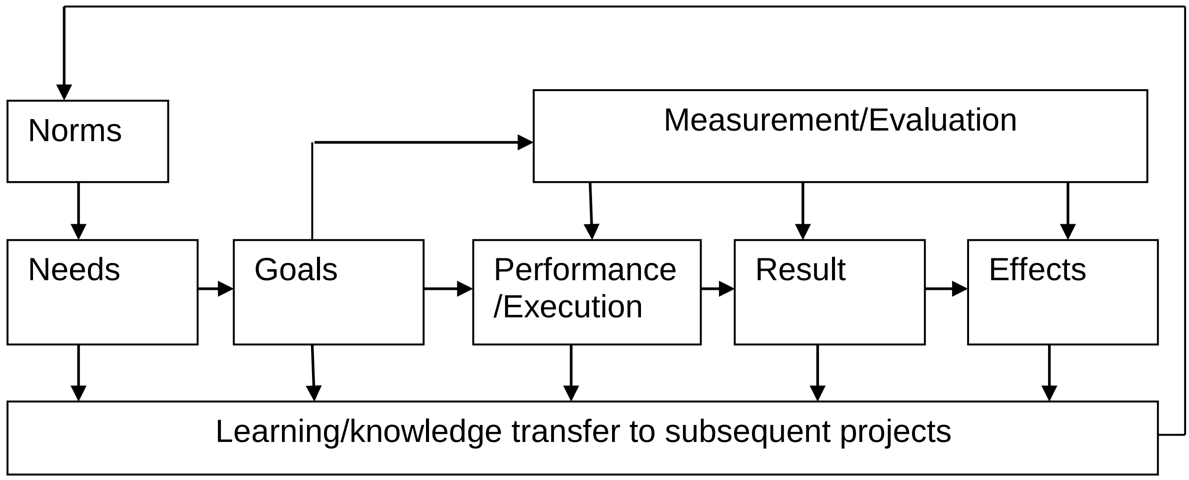
One of the trends observed in the public sectors is the increasing relevance of public participation. Consequently, it becomes necessary for projects' leaders to be able to identify the parties impacted by their decisions and able to participate in the project's life cycle. These parties, defined as stakeholders in the academic literature, can have a significant influence on the progression and outcomes of the project (Kelbessa 2016). Therefore, in order to achieve a successful outcome, it is necessary for the project's management to be able to identify and assess the expectations of stakeholders.

The recommended approach to the described process is a method known as stakeholder analysis. In its basic form, stakeholder analysis involves four stages. During the first stage, the stakeholders are identified. The most intuitive way of doing this is to map the people who are expected to be affected by the project's outcomes. Once the main groups are identified and mapped, it is also recommended to categorize them based on their disposition as external and internal (Riege & Lindsay 2006). In the public sector, internal stakeholders are directly involved in the project's life cycle whereas external ones contribute to the progression by providing feedback and offering experience relevant for achieving the set goals and objectives (Nica 2013).

During the second stage, each stakeholder or group of stakeholders is weighted in accordance with their relevance for and possible impact on the project. At this stage, it is important to acknowledge that the behaviour of stakeholders and respective effects on the project depends on a number of factors, including their relationship with the organization, the issue targeted by the project, and power available to them. The weight can be derived from two main factors: influence, or the capability to change the outcome, and importance, or the priority of a given stakeholder's in the project's hierarchy. Influence can be exerted directly (e.g. by using relevant knowledge or authority) and indirectly (e.g. through social or economic interactions) (Mergel 2013).

Once the weight of all stakeholders is determined, it is necessary to document the findings, preferably in quantifiable form. This is typically done using a simple matrix. By utilizing the factors identified in the previous stage as variables, it is possible to assign stakeholders to four distinct groups. After this, it becomes possible to manage relationships with stakeholders by applying unique sets of principles to each of the categories (Mergel 2013). This approach provides the necessary consistency of actions and allows for monitoring and adjustment of the project's implementation.

Figure 4.2 The Dimensions of Objectives



The public sector encompasses central organizations and downstream institutions that work closely to develop and implement projects or programs (De Vries, Bekkers & Tummers 2014). The projects aim to promote economic growth and improve social welfare. The accomplishments of the public sector are seen in the quality of the services/goods provided (Jung 2013). Therefore, the development objectives of any public sector relate to funding infrastructure and supporting socioeconomic growth through industry-specific regulations and policies. Usually, the development of project goals and objectives takes into consideration social development priorities of a country at a given time (IFAC 2013). For example, a project to improve reading outcomes may have a set of objectives that measure relevant process and outcome variables. In the design stage, two kinds of objectives can be set to guide the project. They include process and outcome objectives.

The growing public dissatisfaction with the performance of the public sector in the recent years has created the need for a response that would provide improvements in organizational performance. The typical goals of such initiatives in the public sector are increased transparency and greater accountability of the organizations, reduced cost of operation, and greater capacity for quality improvement through change (Biygautane & Al-Yahya 2011). These initiatives are typically implemented in the form of projects – systematized programs that utilize a specific structure and comply with a set of universally accepted criteria (Hazel & Jacobson 2014). One of these criteria is the consistency of project's structure, which can be achieved through the use of well-defined phases.

It is important to understand that in contrast to the continuous enterprise, a project is a finite phenomenon. The primary reason for this is a focus on a specific goal or set of goals that are intended to be achieved within a certain time frame. The academic literature frames this property as a life cycle of the project (Mir & Pinnington 2014). In the most basic form, a life cycle is viewed as comprised of four phases: initiation, planning, implementation, and closure (Bertók 2005). The initiation phase is where the project direction is being determined. At this stage, it is necessary to collect evidence confirming the existence of the issue and document its impact on the organizational performance (Mir & Pinnington 2014). Finally, the proposed solutions are reviewed for feasibility and relevance to the problem. The decision-making at this stage is limited to determining strategic direction and outlining the general approach.

The initiation phase is especially important for the public-sector projects for two reasons. First, the projects undertaken in this domain are closely monitored by the controlling organizations due to transparency considerations. An appropriately organized initiation would greatly improve the perceived viability of the organization's actions. Second, unlike for-profit companies, the public-sector organizations often encounter funding restrictions (Kerzner 2017). From this standpoint, the phase in question outlines the expected budget of the project.

During the planning phase, the overarching goal is used to formulate objectives, and necessary actions are determined to meet each of them. After this, each set of actions is examined from the position of economic viability and consistency of tasks with the identified requirements. The outlined tasks, actions, milestones, and variables are then compiled into a document that is used as a primer throughout the project's life cycle. The plan also contains details on the equipment and inventory necessary for project's implementation, time frames of each distinct component, and roles and responsibilities of the stakeholders. In many cases, planning also includes identifying the probable barriers and risks associated with the project (Hwang & Ng 2013). Finally, in the public sector, where accountability is a priority, the plan must also cover the issue of quality by specifying relevant indicators of success, tools for measuring performance, and identified milestones along with the planned achievements. With these components implemented, it will be possible for the project's management to avoid the majority of difficulties and reach the intended outcomes (Hwang & Ng 2013). The majority of decision-making is made and documented at this stage. In public projects, it is important to clarify the outcomes in order to measure the progress over time. Outcome objectives are developed to support performance tracking. They are concise statements that define "who will make what change, by how much, where, and when" (Robinson 2015, p. 8).

During the third phase, the planned changes are implemented. As was mentioned above, in the public sector the progress of the project is closely monitored for consistency with the planned performance (OECD 2014). In addition to accountability, monitoring allows for the introduction of timely adjustments that address minor issues without disrupting the flow of the project. This phase will differ significantly depending on the type of organization. However, the most common approach would be to follow the plan compiled during the previous phase and, in case this is not possible, seek for and implement plausible alternatives. Thus, the decision-making is limited to deciding on the most appropriate response and the mode in which the adjustments can be made.

Finally, the fourth phase occurs once all of the identified objectives are met and the project is considered successful in reaching its overall goal. This conclusion should be backed by documentation containing the results of the evaluation, which is especially important for the public sector, where transparent reporting is one of the conditions (Rees-Caldwell & Pinnington 2013). Often, the closure phase also includes the analysis of the main advantages of the implemented project as well as barriers encountered in the process, ensuring its applicability in similar scenarios in the future.

The described framework was eventually expanded by dividing the implementation phase into launch and performance and control sub-phases. The reason for the change is the amount and diversity of tasks initiated at the starting point of implementation, such as tracking systems setup, resource assignment, and coordination of the effort, all of which can be allocated to the launch phase (OECD 2014). This approach allows for additional focus on identifying and addressing the deviations from the original plan.

Project life cycle and phases were initially intended for use by businesses and other for-profit organizations (Todorović et al. 2015). However, with the growing adoption of other organizational development methods has led to the concept's application in the public sector. The universality and strategic scope of the phases allow for applying the framework to a wide range of organizations in the public sector and, as a result, significantly increasing projects' performance (Todorović et al. 2015).

It is also necessary to mention that different phases pose unique restrictions to the projects' management. The most apparent is the notable lack of planning in the public sectors of some governments. Specifically, the lack of strategic perspective and a clearly formulated plan is sometimes reported as a reason for budget overruns, ineffective risk mitigation and prevention policies, and failure to meet the deadline (Ofori 2013). Implementation phase, on the other hand, can be compromised by the lack of proper communication channels and the inability of the team to detect and address the setbacks in the plan.

The information above suggests the existence of a number of constraints characteristic for the projects. Depending on the scope and type of the project, they can be categorized using various degrees of specificity. However, the most common approach is to use the model referred to as "project management triangle." According to the model, the quality of the final product depends on a combination of three factors, namely the cost, scope, and time of the project (Kerzner 2017). Importantly, the determinants are indirectly related, which means that the adjustment in one area invariably produces changes in other two domains. Therefore, the underperformance in one of the areas can be mitigated at the expense of performance in others, whenever the situation permits such an approach. For instance, the compliance with a short deadline can be achieved by allocating more resources to certain tasks (thereby increasing costs) and eliminating the most lengthy and/or resource-demanding (thereby decreasing scope). Consequently, the increase in scope would require both a larger budget (i.e. increased costs) and longer implementation lifespan (i.e. increased time) (Kerzner 2017). The model is useful as an accessible tool for illustrating the interconnection between the constraints of the project, estimating the areas impacted by the planned adjustments and changes, and communicating the outcomes to the stakeholders.

Other models exist that offer a more detailed disaggregation of project-related constraints. For instance, the cost category can be further disaggregated as consisting of aspects of human resources, equipment, facilities, and infrastructure (Kerzner 2017). In the same manner, the scope-related constraints may include organizational issues, methodological flaws, and legal restrictions.

As can be derived from the information above, each phase of the projects' life cycle has the capacity for the improvement of their results. Therefore, the improvements in question usually aim at increased effectiveness and efficiency of the projects. However, despite the intuitive nature of the concepts, both are rarely defined in the academic literature on project management. Thus, in order to proceed, it is first necessary to provide the definitions of effectiveness and efficiency relevant to project management in the public sector.

In the most basic terms, effectiveness is the capacity to fulfil a certain task (Sundqvist, Backlund & Chronéer 2014). Efficiency, on the other hand, is the capability to organize the procedure in a way that eliminates as many barriers as possible and ensures the best results at the expense of the least time and effort invested in it (Sundqvist, Backlund & Chronéer 2014). In other words, effectiveness is the ability to produce the results whereas efficiency is the ability to arrive at the concluding phase without the unnecessary waste of resources and efforts. By extension, it is possible to assert that the former can be measured by comparing the results to the milestones laid out in the project's plan whereas the latter is assessed by identifying the gaps and inconsistencies in the process and identifying their causes (e.g. insufficient funding or misapplication of human resources). However, it should be understood that these definitions are rarely explicitly formulated in the public sector-related projects (Kaufmann, Kraay & Mastruzzi 2011). In most cases, the terms are used in a self-explanatory manner. In some instances, this approach can be justified by the lack of apparent need to introduce a robust definition – for instance, the projects that utilize specific measureable parameters as determinants of success may only use the concepts of efficiency to outline the overarching goal (Hazel & Jacobson 2014). However, in the situations where these concepts are used as chief determinants of performance, such vagueness can be considered detrimental to the transparency of the process.

At this point, it is necessary to accept the fact that the field of project management covers a wide variety of activities and processes. Since both effectiveness and efficiency are usually attributed to specific processes and utilize different metrics based on their characteristics, it becomes clear that at least on some occasions the concepts will attain different sets of characteristics. According to the study by Sundqvist, Backlund and Chronéer (2014), the characteristics attributed to both effectiveness and efficiency vary significantly across the segment. The most common aspects are the ability to satisfy or exceed customer expectations, the compliance with certain internal requirements, such as cost, timeframe, and resource utilization, and elimination of deficiencies. As can be seen, some of the proposed aspects align with the criteria posed by specific industry standards for quality. It is possible to view the requirements as goals, which allows incorporating the standard definition of effectiveness into the measurements. Understandably, such an approach would only be possible in the projects that deal with variables that are consistent with the requirements of respective standards. The main advantage of such an approach would be the possibility of select the reliable tools and apply guidelines, recommendations, and expertise from related fields.

For the projects that are incompatible with the described approach, project managers often introduce their interpretation of the term. The definitions mainly depend on the priorities of the project, previous experience of the management, and personal perceptions of the stakeholders. For instance, some projects may prioritize adequate allocation of resources as a determinant of performance, thus characterizing effectiveness as the capacity to maximize the returns on the invested resources (Liu, Wang & Wilkinson 2016).

Finally, it is necessary to acknowledge that the views on effectiveness and efficiency are expected to differ depending on the hierarchical structure of the organization. Specifically, the top management segment is more likely to adopt the strategic viewpoint and thus consider the accomplishment of the ultimate goal the main determinant of effectiveness whereas individual team leaders will be more focused on short-term objectives (Ibrahim 2015). Notably, both approaches are consistent with the definitions of effectiveness provided above. Nevertheless, it is clear that such disparity within a single project may lead to confusion and, in certain situations, compromise trust in the project.

For reasons specified above, an assessment of the effectiveness and efficiency of the projects in the public sector is complicated by a number of factors. In the absence of a universal framework, the main source of data is the case studies published in academic journals. According to the study by Pūlmanis (2014), the growing popularity of project management tools and techniques in the public-sector harbours significant potential for improvement. At the same time, the discrepancies between the perceptions of project managers and the results of the self-assessment of the process suggest the insufficient level of maturity of the organization. It is also important to understand that the assessment was conducted on an ongoing project and, as a result, accounted only for the observable and measureable performance (Pūlmanis 2014). In other words, it is more consistent with the accepted definition of efficiency, whereas the authors use the terms “efficient” and “effective” interchangeably, compromising the validity of findings.

The same approach was used in the study of the effectiveness and efficiency of Australian and Chinese projects. The research team relied on factors related to the tendering processes, thus downplaying the relevance of meeting the set goals (Liu, Wang & Wilkinson 2016). In other words, the team prioritized efficiency despite the claims made in the methodology. The described tendency is observed in the majority of the projects conducted in the public sector. The results of the analysis indicate that an increase in effectiveness is included in the list of goals of 18% of the studied articles, followed by increased efficiency at 15% (De Vries, Bekkers & Tummers 2016). However, the most numerous group (35%) does not present a clearly formulated goal. In addition, many of the papers provide vague and inconsistent definitions of the concepts that are only generally attributable to the definitions above.

Efficacy Indicators

The efficacy of a multi-stage public project is determined by its efficiency, effectiveness, and sustainability. Efficacy indicators demonstrate “how well the results at one level of a project” have been translated into outcomes in the subsequent level (World Bank 2013, p. 14). They measure three aspects of a project: “the efficiency of inputs, effectiveness of outputs, and sustainability of the project impact” (World Bank 2013, p. 14). Thus, it can be argued that efficacy indicators highlight the capacity of a project to meet the set objectives.

The logical framework often utilizes efficacy indicators alongside results indicators to measure a project's impact (Jos & Faith-ell 2012). For most projects, the monitoring of project performance ends with impact indicators. However, efficacy indicators can be utilized to track performance in projects where efficiency, effectiveness, or sustainability is a project goal for the institution.

Therefore, organizations can choose to use indicators of efficiency, effectiveness, or sustainability based on the nature of the project. Efficiency indicators capture the proportion of inputs of a project per a unit of outputs generated (World Bank 2013). An example may be the amount of funds or labour needed per unit output. Efficiency indicators are useful in public financial auditing – for measuring the appropriate use of resources/funds for the activities intended in line with accountability requirements (Jos & Faith-ell 2012). In contrast, effectiveness indicators measure the "ratio of outputs per a unit of a project outcome or impact" (World Bank 2013, p. 15). Thus, they measure the extent to which the project outputs influence the outcomes/impacts. An example is the number of immunizations given per a unit decrease in disease morbidity or mortality in the target population. Sustainability indicators capture the continuity of the project's positive outcomes over time (World Bank 2013). Thus, they measure the degree to which the project will remain viable over time, especially after funding stops. They indicate whether the benefits will continue being felt after the project ends.

The management of results and output of project activities is essential in tracking project progress. It encompasses systematic collection and analysis of data to determine the efficiency and effectiveness of a programme or project in generating the intended results (OECD 2013a). Results measurement also highlights the improvements necessary to achieve better performance – outputs, outcomes, and impacts. The concept is widely used in management literature and is related to the idea of 'management by objectives', which has informed public sector reforms since the 1990s in OECD countries. The approach goes beyond the monitoring project resources and activities to include the measurement of the output of the project, i.e., the results. In this context, results are defined as the “output, outcome, or impact –intended or unintended, positive or negative – of a development activity or project” (OECD 2013a, p. 16).

In measuring results, public entities gather and analyze data to determine how well a project/programme is doing relative to the anticipated goals. A survey conducted in 2013 established that over two thirds of OECD countries have created a special unit/department charged with project results measurement and maintenance (OECD 2013b). Besides results management, the special units coordinate quality and planning of the project being implemented. In most projects, results measurement focuses either on deliverables, including short-term outputs, i.e., direct services or goods or on the long-term impacts/changes related to the project outputs.

Results measurement often involves a system that collects data related to the progress of the project. It entails the identification and formulation, in measurable terms, the anticipated results/impacts, in light of the prevailing socioeconomic, environmental, and political realities that influence their achievement. It begins with the formulation of a results chain that establishes the cause-and-effect relationships between resources and activities, culminating in the expected result (OECD 2013a). Additionally, two systems – one for tracking performance and another for explicating the improvements – are developed to complement the results chain. In measuring results, baselines are first obtained to give a picture of the state of affairs before the project is implemented. The baseline data are integrated with the objectives and selected result indicators to enable governments to determine if performance is on course and the contributing factors. The results derived this way can be analyzed with a results model to support public reporting.

An example of a results model is the four-tier framework established by the UK

Department for International Development (DFID). The framework helps track and manage the progress of "development results at corporate level, as well as to publicly report on delivery" (DFID 2013, p. 11). Level one of this framework measures the progress made on specific outcome indicators that involve a collective action of the DFID and particular nations. Level two centers on the results, which include indicators assessing outputs attributable to DFID-sponsored projects, while level three covers operational effectiveness of the programme. Improvements at level three can translate into "better delivery of results and greater value for money" (DFID 2013). Level four is concerned with the measurement of organizational effectiveness. The indicators used in this level measure the efficiency of the corporate processes to help bolster effectiveness in delivering the results (DFID 2013).

The four-tier model is comparable to other result systems adopted for public projects. The four-level model determines data collection and measurement techniques used by governments or development partners. Level one indicators are derived from global measurement systems. They are pegged on millennium development goals that act as the point of reference for public projects globally. In contrast, level two indicators are developed from institutional strategies, while the data are drawn from national measurement systems (OECD 2013a). Level three and four indicators relate to the organizational systems. Some OECD countries have developed simpler results frameworks with a maximum of two levels to give extra weight to country-level results (OECD 2013a). In such models, the first level usually covers the output of different projects, while the second level measures the impact/outcome of each specific project.

The primary goal of building a results framework is to "collate and analyze" key data/information for effective project management (OECD 2013b, p. 6). It allows government agencies to monitor the progress made towards achieving specific results of a project, as indicated by the objectives. The development of results frameworks is a collaborative process that brings together government agencies and civil society organizations (OECD 2013b). The first step of this process involves the selection of a few strategic outcomes related to each project. Subsequently, each outcome is monitored through a set of KPIs – a maximum of three KPIs per outcome (OECD 2013b). A joint evaluation of the results by the various actors is done before compiling a results statement. The statements usually report quantitative and qualitative data related to the project results and provide a basis for improvements in the next project phase. Therefore, up to three KPIs should be selected per result, i.e., each for qualitative, quantitative, and survey data.

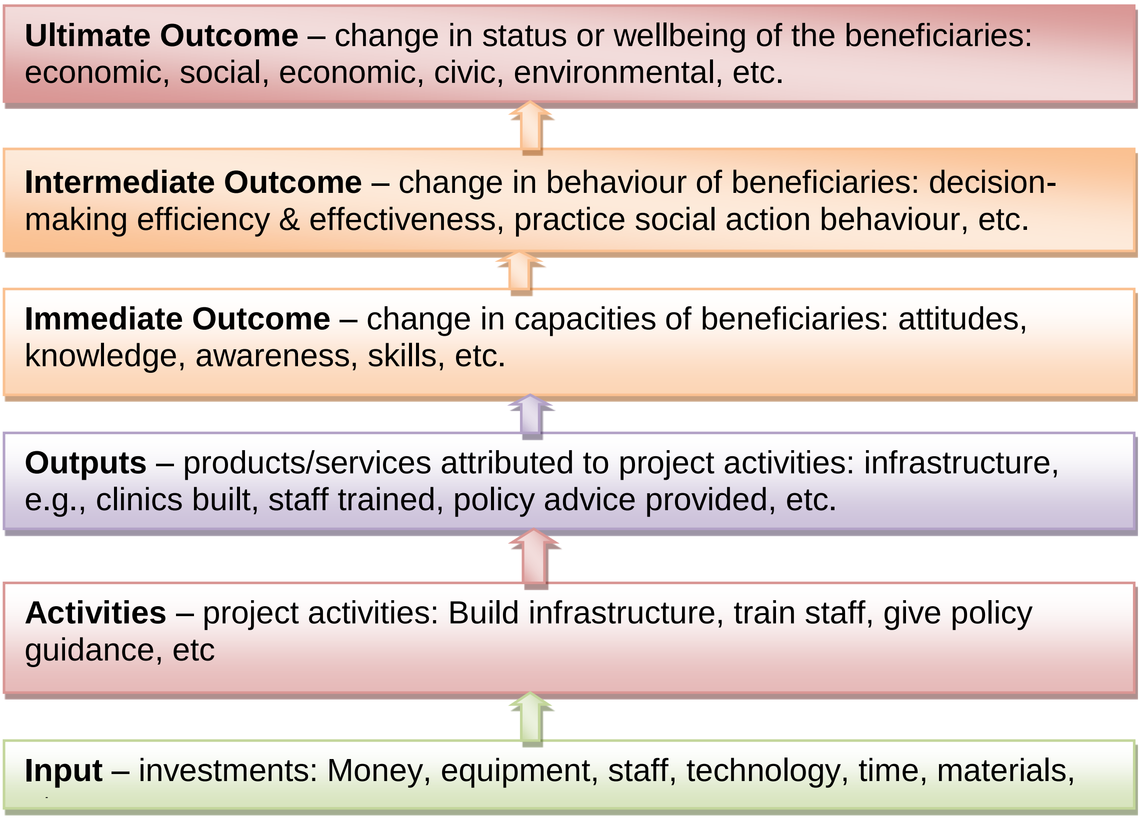
The selection of KPIs is an important process in the accurate measurement of the outputs/results of a project. The right measurements/indicators can help populate the results framework with accurate data. As stated, indicators – whether quantitative or qualitative – either support the measurement of achievement or changes attributable to the project or gauge its progress. Thus, they define specific aspects of a project based on a scale, highlighting the type of data to be gathered to measure output. In other words, they measure how a project is performing against the baseline data. Consistency in the use of appropriate indicators is required throughout the results chain. Various criteria have been developed to help public entities and officials select good indicators. The common ones used by government agencies across the globe include the "SMART (specific, measurable, achievable, relevant, and time-bound) and RACER (relevant, acceptable, credible, easy, and robust)" (World Bank 2013, p. 24).

National guidelines on how to choose good indicators also exist. In Canada, the government developed a results chain to help public entities develop good indicators and measurements for projects. The results chain begins with the input and ends with the outcomes, which fall into three categories: immediate, intermediate, and ultimate outcomes (DFATD 2013). In the results chain, input indicators measure the investments that have gone into a public project, including money, equipment, staff, technology, and time. The results chain also captures the planned activities related to the project. The activities may include infrastructure development or refurbishment, policy guidance, staff training, workshops, and assessments (DFATD 2013). The outputs indicators measure the products/services stemming from the project activities. They may include the number of staff trained, workshops facilitated, infrastructure built, or policy initiatives supported by the project. The impacts or outcomes of the outputs are measured at three levels: immediate, intermediate, and ultimate outcomes. The immediate outcomes indicators measure the change in capacities of the beneficiaries in terms of knowledge, skills, attitudes, processes, and motivations (DFATD 2013). In contrast, the intermediate outcomes indicators measure the behavior changes in the target group in terms of decision-making efficiency and effectiveness and social action practices. The ultimate outcome indicators evaluate the change in status or wellbeing of the beneficiaries of the project. They may include indicators of social, economic, or environmental wellbeing.

The results chain given is an example of how outputs and outcomes are measured during the project. It involves quantitative and qualitative indicators that measure the most relevant aspects of a project. However, technical difficulties related to results measurement forces some public entities to select indicators that monitor quantifiable effects, i.e., outputs that are "easy to achieve and measure" (Danida 2011, p. 12). The problem with the use of quantitative results indicators alone is that they do not give adequate measurement of progress towards the desired change in the long-term. Therefore, complexity-aware indicators that involve feedback loops and qualitative data are recommended (USAID 2013a). Examples include sentinel indicators, and process monitoring, and stakeholder feedback – to obtain the perspective of the beneficiaries.

The results measurement systems should be simple and clear. When choosing indicators, it is important to consider the interests and needs of the stakeholders and the objectives of the public project (APEC 2011). Complex indicators can limit the capacity to measure and attribute the results to a public-sector project. Therefore, selecting simple indicators can help capture the project results and support management goals. To achieve this, public entities adopt a strategic approach when selecting indicators. They involve technical experts and consider project priorities and budget constraints to choose the right indicators (USAID 2013a).

Figure 4.3 DFATD's Results Chain



4.4 Risk-Taking and Decision-Making in Projects

According to the information presented above, risk management one of the chief concerns of projects. The main reason for such a situation is strong emphasis on innovation (Potts 2009). Currently, innovation is viewed as the most feasible means of increasing effectiveness and efficiency of the institutions in the public sector. In response, organizations from different countries have initiated the process of adopting innovative technologies and policies. However, the pursuit of innovation introduces a certain amount of risk into the project.

It should be understood that the situation observed in the public sector is different from that in its private counterpart, from which the concept was adopted. Specifically, the projects in the public sector are known to be inherently less flexible, poorly structured, and prone to design inefficiencies (Page et al. 2015). In addition, the projects in the public sector are more susceptible to political pressures, which have a detrimental effect on the process (Potts 2009). Finally, it should be acknowledged that the growing demand for innovation creates additional pressure on the project managers and, as a result, requires certain capacity for risk-taking. Unlike the private sector, where risk management is already driven by an established set of practices, in the public-sector risk is traditionally managed through avoidance (Holub, Marshall & Hood 2014). It has been suggested that this approach occurs due to a lack of risk diversification by the organizations. It is also important to acknowledge that for the organization in the private sector, it is possible to underperform in several areas and still achieve a positive result by excelling in one aspect. Such net success is rarely available for the public-sector projects, in which achievements in some aspects do not necessarily cover gaps from the failed ones (Kaufmann, Kraay & Mastruzzi 2011).

Evidently, the restrictive conditions described above impact the decision-making of project managers. The issue is further complicated by the introduction of uncertainty. According to the definition, risk complicates the decision-making process via the introduction of known adverse outcomes, whereas uncertainty provides no known outcomes or options as a basis for decisions (Rausand 2013). This issue is only partially acknowledged by the government institutions, which recognize the existence of risk as an inevitable component of innovation but relatively rarely provide guidance for projects willing to undertake it (Bhatta 2003). In most cases, the documents dealing with the question provide a generalized statement on the significance of innovation in achieving excellence of service, maintaining the desired level of quality, reducing workload, and otherwise beneficial for the project’s outcome

(Osborne & Brown 2011). At the same time, no information is offered on the methods of dealing with associated risks, and, in the extreme cases, risks are unspecified or excluded from the text (Braig, Gebre & Sellgren 2011). Some sources go as far as suggesting that risk management is a redundant process that requires considerable funding while providing a negligible positive effect (Osborne & Brown 2011). Understandably, such an attitude impairs project managers' decision-making and reduces risk-taking to aversion and occasional unsystematic mitigation (Bhatta 2008).

As was mentioned above, project planning includes the acknowledgment of risks and development of strategies intended to prevent or mitigate them. The depth level of this aspect of project management differs depending on the scope of the project and the perceived influence of the occurrence of risks on its performance. One of the most feasible solutions is the use of a universally accepted framework that streamlines and systematizes the process. The framework typically includes three stages – identification, evaluation, and mitigation (Deloitte 2015). During the first stage, the potential sources of risk are identified and evaluated for likely of occurrence. The most common sources of knowledge are previous experience with similar projects and data obtained from academic publications (Hazel & Jacobson 2014). Usually, the list is then systematized by assigning categories to the identified risks. Finally, it is possible to further disaggregate the list by utilizing a risk breakdown structure. This approach is useful for visualizing the areas of concentration and, as a result, allocating the resources more appropriately.

During the evaluation phase, the risks are weighted in accordance with their impact on the project. Depending on the expected precision of the project, the likelihood of risk occurrence determined during its identification can be quantified, allowing for a more systematic assignment of priorities. The literature on risk management offers a number of functional tools that can simplify the process, such as impact-likelihood matrices (Kelbessa

2016). However, the projects in public sector rarely make use of these instruments, relying instead on intuitive judgements. The likely reason for this is the lack of familiarity with the instruments and the failure to recognize benefits associated with their use (Jałocha et al. 2014). In addition, the requirements of the evaluation process are rarely formalized, which allows ignoring the procedure or substituting it with informal alternative. Finally, risk aversion is responsible for at least some of these instances.

At the third stage, the findings of the evaluation are used to create a risk mitigation plan. A typical risk mitigation plan contains a combination of strategies addressing the risks based on their likelihood and severity. The mitigation is possible through risk avoidance (implementation of strategies intended to minimize the likelihood of risk), risk sharing (partnering with organizations that can partially address the concerns), risk reduction (direct allocation of funds intended to address specific areas of concern), and risk transfer (relocation of responsibilities to a third party) (Kelbessa 2016). As can be seen, each of the identified strategies requires a certain amount of resources and effort. The availability of the mitigation plan thus provides the opportunity to compare the costs of different strategies and decide on the optimal strategy.

It is also possible that some of the identified risks are perceived as a threat to the project’s success. In this case, an alternative is developed that allows for a favourable outcome despite the occurrence of risk. This alternative, known as a contingency plan, is usually a suboptimal solution in terms of costs and thus requires the creation of a contingency fund reserved for its launch.

As can be seen from the information above, the main bulk of risk management activities are allocated to the planning phase. At this stage, it is possible to gain access to the project’s parameters that may be necessary for creating viable risk mitigation strategies. In addition, at this stage, it is possible to incorporate the contingency plan into the project’s plan to avoid inconsistencies. Finally, the budget required for the creation of a contingency fund may only be available for allocation at this stage (Deloitte 2015). It is also possible to encounter the necessity to initiate a risk mitigation strategy at the implementation stage. In the most severe cases, the encounter of a major risk may trigger a switch to a contingency plan, which will also occur at this phase. However, it should be understood that an appropriate risk mitigation plan requires intervention only in the severe instances, whereas in most cases the flow of the project remains uninterrupted.

Risk Indicators

Risk and sensitivity analyses of a project give estimates of the effect of attaining project objectives on condition that particular assumptions are not met (World Bank 2013). They provide a picture of the effect of changes to exogenous factors on project variables using the what-if scenarios. Therefore, a risk indicator evaluates the impact of external factors (risks) related to the macroeconomic dimension of the project. The exogenous factors include those variables identified as having a direct impact on the project outcome. For instance, energy prices or wages for the project team impact on the project outcome directly. The realization of a project's objectives is contingent upon the existence of a means-effects relationship of the logical framework components and minimal risks.

4.5 Project oversight and Audit

In order to maintain the necessary level of integrity, projects can be subject to control at certain stages of their life cycle. Depending on the character of the project, the control in question can be performed internally or independently by a trusted party. The internal control, commonly referred to as internal audit, is a process aimed at providing assurance of the project's characteristics, such as effectiveness and efficiency, compliance with regulations, and reliability of reporting, among others (Piper 2015). Internal audit is performed through various means, including monitoring, oversight policies and procedures, identification of inconsistencies via communication with respective parties, and establishment of a control environment (IFAC 2013). Depending on the type of data gathered, controlling processes and activities may include supervision of operations, retention of records, installation of physical safety measures (e.g. locks, surveillance cameras), use of security software, and various authorisation mechanisms (Cole, Eppert & Kinzelbach 2008). It is important to understand that internal control does not focus on the financial aspect of the projects and examines all relevant aspects and activities in its life cycle. Depending on the project's scope, the audit can be applied to specific components or to the project as a whole.

In the broadest sense, all participants of projects in public sector are responsible for the audit process. However, the main bulk of activities are concentrated within two groups. The first one is top management, which is responsible for integrating an activity into the project's plan. In addition, project managers establish the necessary environment that promotes accountability and transparency and improves efficiency of the activities (OECD 2007). The second group is internal auditors – individuals tasked to gather, analyse, and report data on the project's efficiency. Auditors are also responsible for maintaining the overall effectiveness of the oversight system. Other common areas of assessment include monitoring of the project's control environment (e.g. identification and elimination of gaps), evaluation of risk mitigation and contingency plans, evaluation of the intra-organizational communication systems, and supervision of the audit's feasibility (Nalewaik & Mills 2014).

Internal audit is organized in accordance with one of two models. The first option, known as centralized audit, is conducted by a single dedicated organization either by delegating tasks to project's members or by placing the organization's representatives within the project (Prabhakar 2009). In the second category, referred to as decentralized audit, the external organization develops standards of the control process, which are then used by project's management to create an internal unit responsible for measuring compliance with these standards (Potts & Kastelle 2010). As can be seen, the second category delegates some of the responsibility to the individual projects. The standards used for the purpose of decentralized audit include performance standards, which provide quality criteria for the typical processes in public sector projects and attribute standards, which determine characteristics of control entities in question.

As can be seen, the decentralized approach offers greater flexibility and independence from external authorities. Nevertheless, it remains relatively uncommon in the public sector, mostly due to firmly established hierarchy and well-defined layers of control (OECD 2014). However, several countries, such as Canada, the United Kingdom, and the United States are already undergoing an adoption of the decentralized practices.

In order to conduct a reliable audit, it is necessary to collect relevant and accurate data. The easiest option is the assessment of progress in terms of meeting the set objectives. A more elaborate approach involves the use of tools producing quantifiable data, such as key performance indicators (KPIs). A KPI is a systematized list of indicators that represent vital elements of the project's performance (Kerzner 2017). Due to their popularity in the financial sector, KPIs are used primarily for financial performance measurement. However, it is equally plausible to use them for the assessment of non-financial outcomes (Kerzner 2017). In the public sector, key indicators may include compliance reviews, staff retention rates, volume and quality of information published in the reporting process, and a number of known unaddressed issues.

4.6 Summary

As can be seen from the literature review, the academic sources cover project establishment in sufficient detail. However, certain important elements, such as a universal definition of efficiency and effectiveness, are scarce. While effectiveness and efficiency are recognizable concepts that are already routinely applied to many projects in public sector, the majority of managers demonstrate insufficient understanding of the definitions and determinants of the concepts. Thus, it is reasonable to expect a wide variety of results that are not necessarily compatible with each other. Another probable outcome is the lack of consistency in the selected approaches and demonstrated results.

Next, it is apparent that at least some of the strategies and tools used in the private industries are applicable to the public sector with only minor adjustments. Some aspects of project management, such as increased attention to transparency and accountability, require additional attention in the project development process.

Finally, a range of issues and barriers can be identified pertinent to risk management of public sector projects. Specifically, despite the availability of tools and techniques adopted from other domains of project management, risks in the public sector are rarely managed consistently.

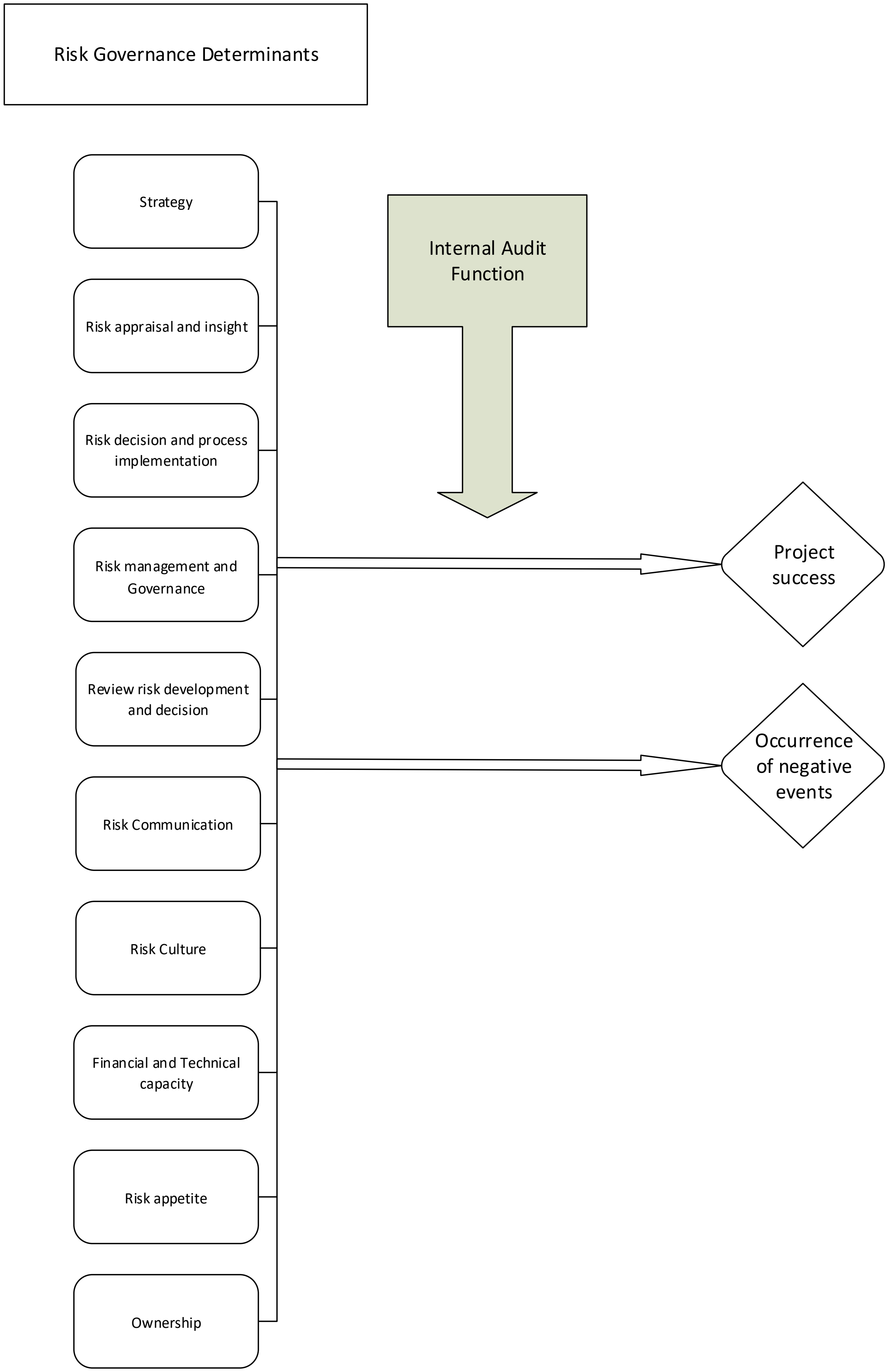
Chapter 5: Conceptual Framework and hypotheses Development

5.1 Introduction

Risk governance is a critical management best practice in all projects. It encompasses a transparent and systematic engagement with identified risks through appropriate responses (Brown & Osborne 2013). This process primarily comprises of risk identification, analysis, assessment, and management that inform risk-based decisions that reflect the organisation's objectives. Therefore, risk governance is a vital control activity that has strong links with the audit function of a firm (Hudin & Hamid 2014). From the literature review, the adoption of risk governance practices in organisational contexts is shown to be dependent on a range of internal factors. These variables constitute the determinants of success in realising project objectives. Further, multitudes of different risk management techniques, practices, criteria, frameworks, and organisational characteristics that influence project outcomes have been noted in literature. The approach an organisation uses to identify, assess, monitor, and control risks inherent in its industry depends on its characteristics, e.g., strategy, risk appraisal and insight, risk communication, appetite, etc.

Therefore, the conceptualisation of the influence of risk governance on project outcomes must involve the institutional variables – internal factors – that determine risk management practices of a firm. The reasons for adopting a risk governance approach should relate to the determinants of project success and the occurrence of adverse events. On the other hand, the internal audit function helps moderate the impact of these drivers on project outcomes. As Shad and Lai (2015) state, internal controls reflect an organisation's characteristics, including its technological infrastructure, organisational structure, and size. The proposed conceptual framework incorporates ten determinants of risk governance practices in organisations (as gleaned from literature) and links them to project outcomes. This research explores strategy, risk appraisal and insight, risk decision and process implementation, risk management and governance, review of risk development and decisions, risk communication, risk culture, financial and technical capacity, risk appetite, and ownership, which are the determinants of project success or occurrence of negative events mediated by the internal audit function, as shown in Figure 5.1. The dimensions of the conceptual framework are discussed below along with the hypotheses formulated.

Figure 5.1: Conceptual Framework


Risk Governance Determinants
Strategy
Risk appraisal and insight
Risk decision and process implementation
Risk management and Governance
Review risk development and decision
Risk Communication
Risk Culture
Financial and Technical capacity
Risk appetite
Ownership
Internal Audit Function
Project success
Occurrence of negative events

5.2 Relative Importance of the Determinants of Risk Governance

The ten factors above collectively contribute to project success. Optimal risk management that maximises on these determinants is required to mitigate risks that impact project objectives and outcomes. Therefore, although risk governance is an integrated process, each variable contributes differently to the overall success of a project or occurrence of negative events. The rating of the variables considers their relative contributions to the risk governance process. From literature, ‘risk strategy’ is a fundamental determinant of risk appetite, which must be aligned with the operational or project objectives of a firm (Beckers et al., 2013). The second factor – risk appraisal and insight – is critical in generating a catalogue of risks that an organisation is exposed to and attendant opportunities. It yields risk categories, types, likelihood, impact, and quantitative assessments that inform risk-based decisions.

Risk decision and process implementation imply risk-informed decision-making that entails identifying strategic alternatives, analysing them, making a well-reasoned selection (Aven 2016). Organisations must establish the foundation for risk-based business decisions and mechanisms and procedures for maximising opportunities that come from the exposure to risk. Risk management and governance constitute a formal function that regulates the risk-taking practices of a firm to ensure that they reflect its culture and monitors or manages enterprise-wide risks to reduce exposure and maximise value (Ellul 2015). The review of risk development and decisions is another crucial determinant that contributes to project success or adverse incidents. It ensures continual improvement of the risk management process through progress monitoring and risk reviews (Aven 2016). Active risk communication is also required within an organisation to improve staff awareness and engender risk-based behaviour and practices. Risk culture, i.e., the prevalent attitudes and beliefs about uncertainties, is a crucial determinant of how managers and employees view and respond to risks. Thus, risk decisions would depend on the system of common values and understanding of organisational objectives.

Another factor considered is the financial and technical capacity of a firm to manage project risks. Comprehensive risk governance requires management capacity to identify, assess, monitor, and handle business threats. Financial resources are needed to conduct a risk assessment and execute mitigation strategies. Furthermore, the technical expertise to implement controls and audit the risk management system is critical. Staff skills in risk governance can be improved through adequate training and preparation. The other determinant is risk appetite, which describes the overall risk level and types the firm is willing to assume in order to realise its strategic objectives (Polk 2014). Regular adjustment of the maximum allowable risks is important due to changing market conditions and organisational capacities. Risk ownership is another critical predictor of project outcomes. Typically, the individual interacting daily with risks, e.g., line managers, as well as the board have the ultimate responsibility to handle business threats. It is clear that the relative contribution of each of the ten determinants of risk governance is not the same. Therefore, the hypothesis posited is as follows:

H1: There is no significant difference in rating the importance of the determinants of risk governance.

5.3 Project Success Determinants

Risk management increases the likelihood of a project being successful. According to Pinto (2014), risk governance as a critical success factor includes structures and procedures used in resource allocation, coordination, and control of each activity throughout the project lifecycle in order to realise organisational objectives. This core element of the broader corporate governance framework is also a good indicator of management performance. The focus of this study is to examine the link between risk governance determinants and project success. Therefore, the ten factors can be conceptualised as indicators of causality. Serra and Kunc (2014) establish that strategy planning correlates with implementation, which implies that governance is a success factor in projects. The significance of risk management in organisations has been shown in previous studies. Joslin and Muller (2016) found that governance does not play a mediatory role in project success; rather, it is a causal factor. Thus, it can be concluded that organisational characteristics predict risk behaviour that in turn influence project outcomes. By extension, risk governance precedes project success (determined at the end), which makes it the cause. Firms establish management structures and mechanisms for risk appetite determination, risk-informed decision-making, risk communication, and appraisal and insight, among other determinants, before initiating projects, which means that success is an outcome of good risk governance – an independent variable.

The criteria for determining project success measure the outcomes at the end of the undertaking. The principal dimensions used may include "project efficiency, organisational benefits, impacts, stakeholder satisfaction, and future potential" (Joslin & Muller 2016, p. 615). Project-related governance is an oversight role that includes a range of actions and practices to realise specific objectives. Optimisation of the risk management process, therefore, would increase the chances of project success. Weaker governance structures are associated with poor business performance (Too & Weaver 2014). The flipside of this assertion is that sound management in organisations engenders higher productivity and outcomes. Therefore, risk management, which is a core element of the corporate governance framework, is an antecedent variable in project success.

The risk governance determinants precede project initiation. To achieve success, an organisation has to formulate a risk strategy, strengthen its risk appraisal, insight, and review, establish risk-informed decision-making, define its risk appetite and ownership, enhance risk communication, and increase its financial and technical capacity before a project is selected. These risk governance determinants are independent of the nature, magnitude, or risk levels of a project (Muller & Lecoeuvre 2014). The primary aim of risk management is to avoid or mitigate events that could impact negatively on a firm's performance, profitability, or output. The success of organisations is dependent on the control structures dedicated to identify and manage relevant risks (Muller & Lecoeuvre 2014). The practical implication of this statement is that risk governance determinants increase the chances of a project being successful. Thus, the following hypothesis posited:

H2: Determinants of risk governance are positively related to project success.

5.4 The occurrence of Negative Events

The realisation of project objectives may be impeded by adverse events occurring during implementation. Factors ranging from delays in delivery to cost overrun can impact project goals. The response strategy for negative threats may include avoiding, transferring, or mitigating the risk situation (Hajikazemi et al. 2016). The aim is to control their effects and potential project failure. Project risk governance requires robust management procedures in the identification, assessment, analysis, and mitigation of 'black swan' events occurring during the design and implementation stages (Hajikazemi et al. 2016). Factors such as delivery deadlines and cost limits are critical constraints in projects. Risk governance procedures ensure that the project progress is within budget and on time in line with the objectives. Projects challenged by threats usually overrun costs and deadlines and lack the attributes specified at the design stage.

Adverse events typically result from poor management continuity, higher expectations, and misalignment between project goals and organisational objectives (Dodson & Westney 2014). They have two primary characteristics: exist as outliers (unlikely occurrences) and have a significant effect on projects. Although they are unpredictable, organisations can manage negative events by being robust and dynamic to withstand these challenges. Kenett (2013) suggests that organisations should be prepared to predict and mount appropriate responses to potential occurrences that may affect projects negatively. Early identification of indicators of negative events and their likelihood of happening can help avoid or mitigate their impact. Within a project management context, determinants of risk governance, such as risk strategy and appraisal and insight, are critical in preventing ‘black swan’ events and their effect.

Another approach for controlling these occurrences includes risk communication. Werther (2013) suggests that facilitating a “flow of independent and transparent information” would enable the project manager and stakeholders to avoid challenges that may lead to failure (p. 8). However, the risk management team must understand that risk analysis tools may not give a reliable forecast of negative events. Therefore, lessons learned from earlier exposure to such occurrences can help strengthen risk management procedures. Mainstream risk governance models can enhance an organisation’s ability to predict and respond to rare events. The emergence of negative incidents in projects indicates an absence of “processes and governance to identify strategic risks” (Dodson & Westney 2014, para. 4). In this regard, measures that enable the project team to recognise and manage events that threaten project objectives are critical. Examples include risk framing (likelihood and effect), strategies for avoidance or mitigation, assessment through probabilistic determination of budgets and timelines, allocation or insurance, and validation via monitoring and regular reviews of the risk frames (Dodson & Westney 2014). These approaches reflect the determinants of risk governance that are included in the conceptual framework.

Firms implementing large projects must test their capacity to withstand the effects of negative events, including cost overruns and lower benefits than those projected at the design stage. Project managers must also take measures to prevent the occurrence of black swans. Such steps may include dividing complex projects into smaller sizes in terms of cost and duration (Kenett 2013). Further, contingency planning can help handle certain risks, while data-driven risk governance can ensure better decisions and effective responses. Other strategies may include strengthening R&D efforts and risk communication in the organisation (Kenett 2013). From the approaches discussed above, it is clear that negative events can be managed through effective prediction or by controlling their impact via risk governance processes and procedures. Therefore, organisations that use these strategies experience fewer negative events than those that do not. Based on this conclusion, the following hypothesis is posited:

H3: Determinants of risk governance are negatively related to the occurrence of negative events in projects.

5.5 Internal Audit Function

Internal auditing is a critical component of effective risk governance along with risk management mechanism. It entails a neutral and objective assurance on risk control processes of an organisation (Florea & Florea 2016). This definition indicates that auditing extends to risk assessment and governance issues in the firm. Therefore, the audit function is a form of internal controls meant to support the management and ensure compliance with organisational processes (Florea & Florea 2016). It encompasses the measurement, analysis, and evaluation of the efficacy and efficiency of the other controls, including risk management techniques. The aim is to minimise costs, maximise benefits, and enhance capacity, which would contribute to project success.

The significance of auditing to projects is grounded in three principles. The first pillar is corporate governance, which includes the organisation's "culture, policies, strategies, and relationship with stakeholders" (Australian National Audit Office [ANAO] 2014, p. 4). It entails transparency and accountability in making decisions. The internal audit function supports governance structures by promoting efficiency in the control and management of institutions (ANAO 2014). The second one is internal controls, i.e., mechanisms that enhance accountability in the organisation. They involve inbuilt procedures for budget preparation, accounting and reporting, and resource administration. They are the controls implemented in the financial management system to ensure allocation efficiency and effectiveness (Reding et al. 2013). Internal auditing is a critical function in corporate governance as the audit committee reports directly to the board and gives suggestions on how to improve the control system.

The last principle is risk management, which lies at the heart of organisational strategy. As aforementioned, risk constitutes an event that impedes the realisation of project objectives, and for this reason, it must be managed. Risk management includes measures that a firm takes to identify, assess, and manage risks or capitalise on opportunities (ANAO 2014). The internal audit function supports risk governance by suggesting the critical controls needed to manage identified risks and estimating the potential trade-offs related to specific threats. In the public sector, the internal audit's functions of assurance, participation, and consultancy enable institutions to improve their operations and achieve accountability (Florea & Florea 2016). In projects, auditing plays different roles. The assurance functions include milestone reviews, pre-implementation and post-implementation evaluations, assessment of product quality (deliverables), and providing advice on the efficiency of the internal controls (Huibers 2013). In this regard, internal auditing supports risk governance processes to realise the objectives of the project.

The second role is consultancy, which encompasses advice to the project management team and stakeholders. Internal auditors give recommendations on the risk assessment methodology, and thus, act as advisors to the board and risk officers. They also provide objective views on how to design the control framework, develop project milestones, and manage change (Huibers 2013). Another important consultancy role is developing a training program to enhance risk awareness and culture (Reding et al. 2013). The participative functions of internal auditing include proactive involvement in internal control matters, provision of alternatives, project coordination, and facilitation of quality assurance, among others (Huibers

2013). The auditors also identify risks emerging from the use of a new system and suggest ways to manage change. From this analysis, it is clear that the internal audit function supplements risk governance through assurance, consultative, and participative roles. It can be viewed as a moderating variable that explains the causal relationship between the determinants of risk governance (independent variables) and project success (dependent variable). Therefore, the following hypothesis is posited:

H4: The relationship between the determinants of risk governance and project success are moderated by the internal audit function.

5.6 Summary

Risk governance has become a critical success factor in organisations. Through an in-depth review of literature, ten determinants that affect project outcomes and objectives are identified. In the proposed conceptual framework (Figure 5.1), these variables influence project success and occurrence of negative events. They include strategy, risk appraisal and insight, risk decision and process implementation, risk management and governance, review of risk development and decisions, risk communication, risk culture, financial and technical capacity, risk appetite, and ownership. From literature, each of these variables contributes to the success of projects, as an antecedent to outcomes, not as intervening factor (Joslin & Muller 2016). This research suggests that the relative contribution of each determinant is not significant. It is also hypothesised that risk management has a positive correlation with project success. Governance structures and procedures for controlling risks can help the organisation realise project objectives (Pinto 2014). The occurrence of unpredictable, black swan incidents is characteristic of weaker risk governance systems. Therefore, a negative correlation is suggested between risk governance determinants and the emergence of negative events. The internal audit's assurance, consultative, and participative roles help strengthen risk controls in organisations (Huibers 2013). Therefore, it is suggested that auditing moderates the relationship between the risk governance determinants and project success.

Additionally, the question of testing the hypotheses that were proposed in previous subsections should be discussed. In general, these four hypotheses represent the development of the arguments of this thesis as well as the structure of the following sections. The first hypothesis could be considered as the preliminary assumption, which serves as the basis for the development of the research on the topic. In Chapter 6 and 7, a questionnaire is developed in order to retrieve information from respondents about the role of the risk governance factors and the perceived impact of various factors in project outcomes. In Chapter 7, the factor analysis is conducted to rate the importance of the determinants of risk governance. These factors are rated differently by the respondents since these determinants have various levels of impact on project development and implementation.

The second hypothesis about the positive relationship between the determinants of risk governance and project success is tested in Chapter 7. The correlation analysis is carried out in order to find evidence for the positive relationship between two mentioned aspects of project development. The third hypothesis about the negative relation between the occurrence of adverse events in project and the determinants of risk governance is tested in Chapter 7. This hypothesis is closely related to the previous one as they both assume that the successful implementation of a project is largely dependent on the use of the risk governance instruments. The fourth hypothesis aims to fulfil the primary purpose of this research, which is to find evidence for the internal audit function’s impact in moderating the relationship between the project success and the determinants of risk governance. This assumption is tested in Chapters 7 along with the further discussion of the results.

Chapter 6: Methodology

6.1Introduction

The government of Dubai is keen on promoting infrastructural development to spur economic growth. Many of these projects are costly. As the government continues to make more investments in other major projects in the fields of transport, construction, and security among others, it is of interest to ensure that the intended goals are realised in the best manner possible. The internal audit function is critical in ensuring that these programmes are completed within the desired time. In the previous chapters that focused on the literature review, it is clear that internal audit functions help in early detection and proper management of risks before they can affect various activities being undertaken in such big projects. In this chapter, the focus is to provide a detailed explanation of the method that was used in conducting the investigation. According to Saunders and Lewis (2017), it is critical to come up with a proper plan when conducting research. The chapter outlines the approach that was taken to collect data from various sources, the analysis approach, and major assumptions made in the study. It is divided into nine sections.

6.2 Research Philosophy

The first step that a researcher should take when conducting major academic research is to define the most appropriate research philosophy. Nestor and Schutt (2014, p. 41) define research philosophy as the "belief about ways in which data about a phenomenon should be collected, analysed and used." It focuses on the nature, source, and the approach used in the development of knowledge in a given study. Hanzlick (2015) explains that the chosen philosophy defines assumptions and beliefs that will be upheld when collecting and analysing data. A researcher may embrace any of the four research philosophies (pragmatism, positivism, realism, and interpretivism) based on aims, objectives, and the set research questions. One must ensure that the chosen philosophy is able to meet the set goals and facilitate answering the research questions in the most appropriate manner possible. Pragmatism research philosophy holds the assumption that a concept can only be considered relevant if it can support an action. It holds the belief that the world can be interpreted in many ways and no single approach can befit all scenarios when conducting a study. As such, the most basic way of considering the validity of a concept is its ability to support a given desired action. Realism holds the belief that reality and the human mind are independent. What one believes may not necessarily be the truth unless it is supported by scientific methods of analysis. Interpretivism requires a researcher to interpret various elements of the study and in doing so one is allowed to integrate his interest.

The nature of questions and the objectives that should be achieved in this research make the first three research philosophies discussed above less desirable because of their principal assumptions. The most appropriate research philosophy in this study is positivism. It holds that a view or a concept can only be factual if it gained through observation. A trustworthy knowledge must be gained through the senses and may sometimes require the use of an appropriate instrument. The researcher's role is strictly limited to that of collection and interpretation of data (Yanow & Schwartz-Shea 2014). A researcher must remain objective throughout the process of collecting and analysing data. Personal opinion or interests in the study should not be allowed to influence the process in any way. This approach made it possible to analyse how internal audit functions help in the identification and management of risks in Dubai's public projects.

6.3Research Conceptual Framework

The process of collecting data can sometimes be a very complex process that requires a thorough understanding of steps that should be taken and assumptions that can be made at each stage. Looking at the conceptual framework below (figure 6.1) helps a researcher to understand these steps and beliefs that should be embraced in each stage. The framework shows that the first step that a researcher should take is the identification of the research philosophy. The next step should be the selection of the research approach that must be in line with the beliefs and assumptions of the chosen philosophy. A researcher can then select the most appropriate research strategy based on the goals of the study. The process then narrows down further to data collection and analysis. Using this framework, it is easy to define the path that a researcher takes to collect and analyse primary data collected from respondents.

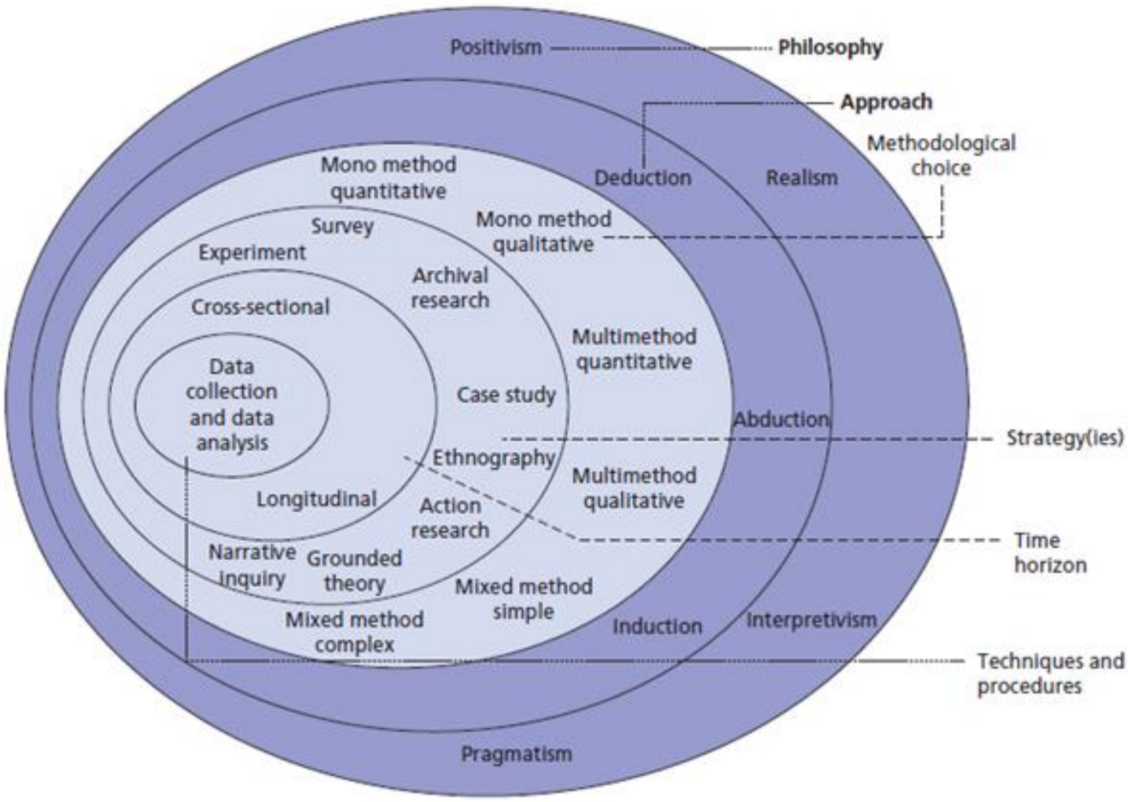


Fig. 6.1. Research conceptual framework (Rovai, Baker & Ponton 2013).

6.4Research Approach

The research's conceptual framework above shows that after identifying the appropriate research philosophy, the next important phase is to determine the most appropriate approach based on assumptions and beliefs of the selected philosophy. The research used quantitative research method as the most appropriate research design. According to Nestor and Schutt (2014), quantitative research is always associated with a positivist paradigm that emphasises on the collection of data and conducting a statistical analysis before one can make conclusions.

The researcher developed hypotheses based on research questions. Hypotheses focused on determining the relationship between various variables in risk management and how internal auditing enhances such process. The variables were analysed statistically to establish the relationship.

6.5Development of Questionnaire

When developing a questionnaire, Hanzlick (2015) strongly suggests that emphasis should be placed on its ability to collect the required information in the simplest way possible. Sections of the questionnaire and questions asked should be unambiguous. The questionnaire was designed and reviewed to ensure that it focused on the relevant information that needed to be collected from participants. The language used in designing questions was simple to avoid cases of misinterpretation. Given that the quantitative method was the chosen research design, questions used were closed-ended. Using the Likert scale, it was possible to assign statistical values to each of the possible responses from participants. The structured format of questions made it easy for respondents to fill in questionnaires sent to them within a short period. The approach made it possible to analyse their responses statistically.

6.5.1 Structure of the Questionnaire

According to Nestor and Schutt (2014), it is always advisable to develop a questionnaire after conducting the initial review of the literature. The information from the review should form the basis of questions and the structure that the questionnaire should have. This study was no exception. The questionnaire had 148 questions in the following five categories:

Part 1-The determinants of risk governance framework which consists of 93 questions

Part 2- The risk-based audit and the project success which consists of 28 questions

Part 3- The occurrence of negative events of projects which consists of 10 questions

Part 4- The role of internal audit function in risk management which consists of 9 questions

Part 5- the demographic information which consists of 6 questions

In each of the first four parts of the questionnaire, the five-point Likert scale (very unlikely, unlikely, neutral, likely, and very likely) was used to determine the degree of agreement that respondents have towards each question that was posed to them. The approach made it easy to code these responses for purposes of mathematical analysis. The last part of the questionnaire focused on the demographic information of the respondents. The level of management of respondents, work experience, educational achievements, age, gender, and nationality were captured in this section. Tracy (2013) argues that in many cases the demographic factors define assumptions and beliefs of respondents on a given issue. Factors such as age, academic qualifications, and experience increase one's knowledge on a given issue. On the other hand, gender and management position that one holds can influence assumptions and biases of an individual when answering specific questions. This section made it possible to capture any form of bias along demographic lines.

6.5.2 Administration of the Questionnaire

According to Nestor and Schutt (2014), an effective questionnaire that captures all the important issues of the study is crucial in the collection of the primary data. In many cases, poorly developed questions limit the capacity to get the needed information as defined in the research objectives. After developing the questionnaire, the next important step is to ensure that it is delivered to the required respondents. The delivery process can be challenging, especially when dealing with individuals who have busy schedules or when the geographical distribution is wide. In this section, the researcher will analyse steps used in designing the questionnaire and the approach that was used in its distribution.

Extracting variables from literature review was the first step in the development of the questionnaire. The review provided important information about determinants of risk governance assurance from the perspective of internal audit functions. By explaining independent factors whose occurrence (or lack of occurrence) influences dependent factors in project management, the researcher was able to identify independent and dependent variables in the study. The review provided preliminary information on the relationship between these variables. The information made it possible to develop questions that focused on a further investigation of the established relationship. All the questions used in the research were developed in the same pattern, except those that focused on determining the demographic factors of the respondents.

Reviewing and editing by the director of studies and getting the approval from the management of the British University in Dubai were important before moving to the next step. As an academic research, it was important to involve the director of the study to approve the questions before sending them to respondents. Fowler (2013) notes that sometimes a researcher may develop questions that a section of respondents may find offensive or inappropriate based on their socio-cultural beliefs or gender. Getting an expert opinion on such issues is critical to ensuring that the set questions would be received positively. It was also important to get the opinion and suggestions of the director as an assurance that the research was taking the right direction. It was expected that the director would identify areas of weaknesses in the questionnaire and suggest necessary changes before it was used. The stage helped the researcher to come up with an effective instrument of data collection. Then the questionnaire was distributed among 5 different staff in the Dubai government as a pilot experiment in order to validate the questions and the time prior the distribution among the selected sample.

The next important face was to identify the right individuals to take part in this study. Targeting the staff from the internal audit department and risk management functions and top management was considered relevant. These are individuals who are constantly involved in the identification and management of risks in public projects. The experience in past projects would help in shedding light on the issues the researcher was investigating. The junior employees who are always involved in the identification of risks at the earliest stages possible and the senior officers such in the public sector, who are always involved with the policy making, were targeted for the study. The next stage was to ensure that the document is distributed to the targeted individuals. Distributing hard copies of the questionnaire in the Middle East Risk Management Forum dated 11- 12 December 2017 which was organised by the General Directorate of Residency and Foreigners Affairs in Dubai, upon making a special request. The forum was attended by 500 professionals in risk and internal audit fields in Government of Dubai. As such, it was a perfect forum to collect the needed information for the research. The researcher further used the survey monkey to gather data from a wide range of respondents. Tracy (2013) observes that having a wide range of respondents helps in addressing issues such as bias and misleading information that may come from a few individuals who may have personal interests in the outcome of the study

6.5.3 Selection of Respondents and Data Collection

According to Picardi and Masick (2013), when collecting primary data, one must understand that bias may be witnessed based on the managerial position of respondents. The top managers may want to paint a picture of perfection to protect their image. On the other hand, the junior-most employees may give a grimmer picture of the situation than is the case because of their desire to express their frustration. It is the reason why the researcher selected participants from all levels of jobs, starting from the top level (chief executive officers, chief financial officers, Chief Audit Executives, and Chief Risk Officer) to officers in risk management functions and auditors in the public sector in the Government of Dubai. The sample includes expatriates' experts in government of Dubai. In such a highly diversified group of respondents, it was easy to overcome such challenges in data collection. The data were obtained from governmental organisations in Dubai, which deals with various public projects. Of interest were departments that had been involved in megaprojects over the recent past. The researcher identified 25 organisations, and all of them are funded by the government of Dubai.

6.6. Research Questions

According to Nestor and Schutt (2014), it is important to develop research questions that will provide comprehensive information about the area of study that one is investigating. As explained above, the researcher developed 148 questions that were sent to the respondents. Questions were structured to ensure uniformity when providing answers. Hanzlick (2015) says that administering structured questions is simpler than when one has to handle unstructured questions. Instead of providing lengthy explanations to each question, a respondent only has to choose one of the options provided. All the questions were based on the four basic questions that were developed in chapter 1 of this thesis. The four basic questions include the following:

I. What are the existing determinants of risks governance in public sector?
II. What are the determinants of project success?
III. What are the audit function task in managing the risks in the public organizations?
IV. What is the association between risk governance determinants and project success?

It is important to note that the review of the literature provided basic answers to these questions. The information obtained from the literature review was then used to develop various variables that were analysed using the primary data collected from the 148 questions.

6.7. Sample Size

The researcher was keen on identifying a relatively large sample size. Fowler (2013) argues that it is common to find cases where the majority of those who commit to taking part in the study fail to do so for various reasons. As such, it is advisable to select a large sample size to ensure that even if a section fails to answer the questions in time, there will be a sufficient number of questionnaires that will be answered. The population of risk auditing in Dubai is unknown. There are no registers or local professional institutions to confirm the size of the population of experts. However, the research is estimated of sample size of 500 based on auditing function and risk management functions in Dubai public institutions.

The following formula is used to compute the sample size: (McClave et. al,2005)

$n = ((1.96)^2 x p * q)/d^2$

Where n = required sample size,

p = proportion of the auditor population having expertise in risk auditing

q = 1-p

d = the degree of error

The author best guess estimate is that 10% of auditor population in UAE are expert in risk auditing. The:

p =0.1

q =1-0.1 = 0.9

d = 5% margin error

$n= 3.84 *0.1*0.9/0.05^2 = 0.35/0.0025 =140$

The researcher contacted about 500 respondents through e-mails, social media, and a risk management forum that was held in Dubai. However, only 151 of the 500 respondents made an effort to answer questions within the set timeline. It was noted that a few of these 151 respondents did not complete answering all the questions by the time of submission. Only 113 questionnaires were fully completed and ready for analysis. The overall response rate that was achieved was 22.6%. A sample size of 113 respondents was considered adequate to support the study. The information obtained from the other 38 questionnaires that were not fully completed was also important.

The justification for the low response rate should be provided. First of all, as it was already mentioned, there is no reliable data on the exact size of the population of risk managers, auditors, and other experts in the area of concern which is studied in this paper. Therefore, the author had to rely on approximate estimations of the desired sample size, which would be sufficient for the purposes of the research. Secondly, the scope of the sampling process targeted a considerably specific population. Due to various peculiarities of their profession and, possibly, the inability to share information about their companies' internal processes, the response rate was evidently low. The third factor might be the data collection method. Since the questionnaires were sent to the potential participants by e-mail, some of them might not be received due to such factors as spam filters.

The study by Sheedy and Griffin (2017) exemplifies the complexity of retrieving meaningful information from respondents. Despite the fact that the authors' research had vast support and the respondents were encouraged to answer honestly, the response rate varied from 21% to 56% (Sheedy & Griffin, 2017, p. 8). Sheedy and Griffin (2017) conducted their research in the same field as in this study, and thus it is possible to state that enterprise employees tend to have lower rates of participation due to factors that not profoundly studied. Nevertheless, the sample size of this research was sufficient to perform profound analysis.

6.8 Data Analysis

After collecting the needed data from respondents, the next phase involved the analysis. As explained above, the quantitative research design was considered the most appropriate in achieving the set objectives. The first step of the analysis was to code the collected data into an SPSS (Statistical Package for Social Scientists) spreadsheet. After coding the data, the next phase was to run analysis based on what was desired. The statistical analysis focused on the following:

Reliability test: The researcher was interested in measuring the internal consistency, and the use of Cronbach's alpha was selected as the most appropriate method because it made it possible to see the relationship between coded groups. Hanzlick (2015) explains that Cronbach's alpha can be considered a measure of scale reliability. Determining the average inter-correlation among coded items made it possible to establish the relationship between various variables in the study. It facilitated the measurement of the dimensionality of the data.

Descriptive analysis: The statistical analysis made it possible to determine the relationship between the identified variables. However, it was also important to express the views of respondents beyond the provided statistics. As such, elements of descriptive analysis were also embraced, although the chosen design was quantitative. The researcher explained views of respondents on various issues to help justify the statistics that were obtained from them.

Factor analysis: The analysis was helpful in the extraction of critical factors that explain risk governance determinants from the observed data. The analysis applied maximum likelihood as the method of extraction because it enables computation of varying indexes, determination of the significance of factors, and the calculation of correlation and confidence intervals (Fowler 2013). The analysis was done on 10 scales which include strategy, risk appraisal and insight, risk management and governance, review risk development and decision, risk communication, risk culture, risk appetite, risk-based audit and project success, the impact of negative events, and internal audit functions.

Analysis of variance: The analysis of variance, mostly known as ANOVA was used to analyse the relationship between different variables. It is critical in the analysis of hypotheses to determine from the data collected accepts or rejects the set relationship between the variables.

Correlation analysis: The researcher was also interested in quantifying the strength of the association of variables using correlation coefficients. Using this analysis, it was possible to statistically analyse the relationship between the ten latent clusters (scales) outlined above with success of public projects. The analysis focused on how each of them affects projects success.

6.9 Summary

The chapter has provided a detailed discussion of methods that will be used to collect and analyse data from respondents. The research instrument used to collect data, and the method of its delivery has been discussed. Positivism was identified as the most appropriate methodology because the research design selected was quantitative analysis. The chapter has identified the sample size that was used and the specific individuals who participated in the study. Various statistical methods relevant for the analysis of the primary data have also been discussed.

Chapter 7: Results

7.1 Introduction

This chapter discusses the result analysis of the instrument used in this research paper. This will be followed by a discussion of the general information gathered from questionnaire participants, descriptive statistic, factor analysis, analysis of variance and lastly, the correlation analysis.

Risk governance and risk management allow businesses to identify strengths, limitations, threats, and opportunities of their current and future projects. Examining how risk governance can influence project outcomes and success is a useful task that could potentially strengthen the competitive advantage and ensure that an organization reaches the objectives it has set earlier. Thus, the primary aim of the research is to critically investigate the relationship between effective risk Governance and the overall success of public projects in the Dubai.

There are various determinants that influence the success of public projects, in this research the researcher focuses on the risk governance determinants as factors that related to the success of the projects, the factors are considered the main construct of the designed questionnaire representing 5 main questions; the first question extends to 10 sub-questions which represent the determinants of risk governance. In order to cover the consistency and reliability of the collected data, the researcher will conduct primary tests on the data using Cronbach's Alpha method.

The statistical analyses part primarily undertaken through SPSS software. This software is widely used in research in order to perform data entry and then generate graphs and tables on the basis of the analysis of entered data (Hinton, McMurray & Brownlow 2014; Leech, Barrett & Morgan 2014). It is recurrently used to deal with large data sets and can be utilized to conduct different types of analyses. The majority of individuals operating in the business world and social sciences tend to employ SPSS in their practice.

7.2Respondents' General Information

The sample included approximately 500 respondents that were contacted via social media, email, Risk management forum, and other methods. The researcher distributed hard copies of the questionnaire in the risk management in middle east forum and then collected the answers by means of the online service titled Survey Monkey. The sample represented the public sector of Dubai because the researcher was aware of the differences in the level of readiness of government organizations in terms of risk governance. Out of all surveys, only 151 were almost completed (113 out of 151 were fully completed and ready to be analysed further). The survey took place for two months and the overall response rate was 22.6%. Then, the researcher generated a database in SPSS so as to examine the information that was acquired from the respondents. Below, a summary can be found.

Table 7.1 Sample responses summary.

Responses Collector	Targeted Population
Email	250
Social Media	150
Risk management forum	100
Total sample size	500
Total Responses received	151
Completed Responses	113
Total Response Rate	113 / 500 * 100 = 22.6%

The overall number of questions in the proposed survey is 148. The time spent on answering all those questions (approximately 25 minutes) became a serious challenge for the researcher in terms of achieving a decent response rate. Nonetheless, further analysis could be conducted even on the basis of the attained response rate. According to Bartlett et al. (2001), the number of respondents from 72 to 96 is sufficient for the overall population size of 500 (it is also illustrated in the table 8.2). This means that the marginal error is 0.03 and alpha level is between 0.1 and 0.05. Accordingly, the number of respondents that took part in the existing research project is above the minimal acceptable range proposed by Bartlett et al. (2001). This left the researcher being highly confident about the results of the current research project and validity of the data that was obtained via surveys. They carefully proceeded with the interpretation of the obtained data and its careful analysis.

Table 7.2: Minimum sample size for a given population (Bartlett, Kotrlik & Higgins, 2001, p.48)

Population size	Sample size					
	Continuous data (margin of error=.03)			Categorical data (margin of error=.05)		
	alpha=.10 t=1.65	alpha=.05 t=1.96	alpha=.01 t=2.58	p=.50 t=1.65	p=.50 t=1.96	p=.50 t=2.58
100	46	55	68	74	80	87
200	59	75	102	116	132	154
300	65	85	123	143	169	207
400	69	92	137	162	196	250
500	72	96	147	176	218	286
600	73	100	155	187	235	316
700	75	102	161	196	249	341
800	76	104	166	203	260	363
900	76	105	170	209	270	382
1,000	77	106	173	213	278	399
1,500	79	110	183	230	306	461
2,000	83	112	189	239	323	499
4,000	83	119	198	254	351	570
6,000	83	119	209	259	362	598
8,000	83	119	209	262	367	613
10,000	83	119	209	264	370	623

7.3 Reliability Analysis

In order to measure internal consistency, the researcher chose to use Cronbach's alpha. This was the most suitable method because it allowed them to see the relations in coded groups. According to the literature, Cronbach's alpha can also be perceived as a measure of scale reliability (Eisinga, Grotenhuis & Pelzer 2013; Geldhof, Preacher & Zyphur 2014). This means that, for instance, a high α value makes the measure unidimensional. On the other hand, there is a need to provide evidence that internal consistency is in place and all the additional analyses are available to the researcher (see Table 8.2). Therefore, Cronbach's alpha can be seen as a coefficient consistency test and not a mere statistical variation of the latter (Bonett & Wright

2015). The researcher was interested in studying the average inter-correlation among coded items.

The key objective of using Cronbach's alpha was not to measure either the dimensionality of the data or to test its undimensionality (Geldhof, Preacher & Zyphur 2014). Instead, the researcher was looking for similar coefficient scales that could be disclosed only by means of an experimental factor analysis (Eisinga, Grotenhuis & Pelzer 2013). Moreover, Cronbach's alpha is not a mere measure of validity that only records "true" scores. It is important to remember that a reliable measure is the one that does not include any measurement errors that can distort the measurement process and trigger inconsistent outcomes (Adamson & Prion 2013). Nonetheless, there should be room for systematic error because reliability of the data is supported by its consistency and does not have to be completely error-free.

In order to measure the concepts at hand, the researcher went further and did more than a simple test of reliability while trying to measure a number of concepts (Geldhof, Preacher & Zyphur 2014). Instead, they evaluated the validity of the scale by means of applying both substantive and theoretical knowledge and finding all the reasons for considering certain measures to be either accurate or inaccurate (Eisinga, Grotenhuis & Pelzer 2013). As it can be seen from the table 7.2, the existence of empirical relationships between the concepts of interest and pre-set measures can also be seen as one of the most important components of addressing the study variables by means of Cronbach's alpha due to the fact that the values of alpha are within the allowed limits and are in line with the requirements of the study (Eisinga, Grotenhuis & Pelzer 2013). Analysis of the results of the study showed that all the variables have a relatively similar coefficient of reliability.

Table 7.3 below assesses the Cronbach alpha associated with each of the determinants of risk governance measured.

Table 7.3 - Results of Cronbach Alpha test for the study measures

Factor	Code	Item	Alpha if deleted	Cronbach Alpha (α)
Strategy	S1	existence of process to align risks with strategic objectives	.930	**.940**
	S2	existence of identification process of potential risk	.929	
	S3	existence of process for alignment of risk profile with business and capital management plans	.930	
	S4	existence of procedure for integrating the risk management into strategic decision making	.930	
	S5	existence of risk management oversight body	.932	
	S6	existence of mechanism for understanding and enforcement of risk practices by board	.931	
	S7	existence of process for compliance with regulatory requirements	.937	
	S8	existence of internal audit process to implement formal risk management program	.943	
	S9	existence of financial crisis impact drives to implement risk management program	.938	
Risk appraisal and insight	RAI1	existence of risk identification mechanism	.965	**.970**
	RAI2	existence of mechanism for risk depository including vocabulary for risk types	.967	
	RAI3	existence of qualitative risk assessment criteria	.966	
	RAI4	existence of quantitative risk assessment criteria	.965	
	RAI5	existence of mix qualitative and quantitate risk assessment criteria	.966	
	RAI6	existence of mechanism for frequent updating the risk assessment	.965	
	RAI7	existence of process for regular quantification and aggregation of risks	.967	
	RAI8	existence of guidelines for prioritization of risk management and control	.967	
	RAI9	existence of control framework calibrated in line with risk appetite	.966	
	RAI10	existence of guidelines for quantified of tolerance for loss or negative events	.969	
Risk decision and process	RD1	existence of procedure for grounding of risk in all business decision	.896	**.924**

implementation	RD2	existence of mechanism for embedding risk optimization in strategic decision	.897	
	RD3	existence of procedure for executing core business processes and operations based on risk consideration	.897	
	RD4	existence of simple risk model as support business too for decision	.915	
Risk Management and Governance	RMG1	existence of risk management policies and procedures	.973	**.974**
	RMG2	existence of support and sponsorship of the risk management by the board and executive	.972	
	RMG3	existence of regulatory requirements to adopt risk management practices	.974	
	RMG4	existence of Chief Risk Officer position	.974	
	RMG5	existence of formalized approach to addressing risks	.972	
	RMG6	existence of guidelines for definition of role and responsibilities of risk staff	.972	
	RMG7	existence of risk communication mechanism	.972	
	RMG8	existence of whistleblowing mechanism	.976	
	RMG9	existence of ethics and code of conduct policies	.974	
	RMG10	existence of guidelines for risk internal control	.973	
	RMG11	existence of guidelines for definition of risk accountability and ownership	.973	
	RGM12	existence of guidelines for internal audit as assurance task	.974	
	RMG13	existence of risk function	.972	
	RMG14	existence of risk treatment plans and response strategies	.972	
	RMG15	existence of process for risk identification, assessment and prioritization	.972	
	RMG16	existence of process for identification and monitoring key risk indicators	.972	
	RMG17	existence of regular risk communication by board and senior management	.972	
	RMG18	existence of formal risk oversight authority	.973	
	RMG19	existence of procedure for fraud risk assessment	.973	
	RRD1	existence of Internal Audit assurance framework for risk management	.959	**.959**

Review Risk Development and Decision	RRD2	existence of process for ongoing update of risk assessment	.956	
	RRD3	existence of mechanism for independent assurance by third party	.957	
	RRD4	existence of guidelines for board/audit committees oversight	.952	
	RRD5	existence of process for monitoring and review of risk management framework	.954	
	RRD6	existence of guidelines for revision and reconstruction of risk management	.955	
	RRD7	existence of periodic reporting on risk to risk oversight authority	.952	
	RRD8	existence of process for escalating and notifying the risk acceptance to the oversight authority	.953	
	RRD9	existence of process for management and monitoring of risk exposures	.952	
	RRD10	existence of documentation process	.954	
Risk Communicatio n	RC1	existence of process for risk communication mechanism	.946	**.951**
	RC2	existence of process to promote the Transparency	.947	
	RC3	existence of guidelines of roles for coordinating risk management activity	.944	
	RC4	existence of guidelines for appointing risk champions from business unit	.946	
	RC5	existence of risk awareness initiative	.950	
	RC6	existence of procedure for internal communication of amount and type of risk to accept and manage or avoid	.946	
	RC7	existence of process for external communication to promote transparency and accountability	.950	
	RC8	existence of guidelines for monitoring and reporting of performance against risks	.948	
	RC9	existence of risk register	.950	
	RC10	existence of risk heat map and dashboard indicates risk portfolio	.948	
	RC11	existence of key risk indicators report	.946	
	RC12	existence of aggregated quantitative risk exposure report	.947	
Risk Culture	RCU1	existence of guidelines for promotion the accountability	.939	**.940**
	RCU2	existence of risk awareness program	.930	
	RCU3	existence of guidelines for internal audit role to promote risk culture	.933	

	RCU4	existence of guidelines for risk management training for board and staff	.930	
	RCU5	existence of process for risk culture audit	.939	
	RCU6	existence of program for development of talents and skills	.928	
	RCU7	existence of guidelines for fostering risk understanding and conviction	.929	
	RCU8	existence of formal training of fraud risk awareness and ethical culture	.930	
Financial and Technical capacity	F1	existence of mechanism for allocating adequate Capital to deal with risk	.885	**.904**
	F2	existence of mechanism for acquiring skills and management capabilities	.868	
	F3	existence of human skills	.892	
	F4	existence of financial resources	.887	
	F5	existence of risk technology	.884	
Risk Appetite	RA1	existence of risk appetite framework	.975	**.978**
	RA2	existence of definition of risk appetite statement	.975	
	RA3	existence of mechanism for understanding the current risk capacity	.975	
	RA4	existence of periodic review of appetite limit with reference to evolving industry and market condition	.975	
	RA5	existence of frequent revision of risk appetite in line with the change of strategy	.974	
	RA6	existence of guidelines for alignment of risk appetite between board and business function	.974	
	RA7	existence of guidelines for communication of risk appetite tolerance	.974	
	RA8	existence of reporting process for any instances where the appetite and specific risk thresholds are reached	.9874	
	RA9	existence of process for integration or risk appetite into the performance management framework	.977	
Ownership	O1	existence of guidelines for risk ownership allocation	.902	**.923**
	O2	existence of guidelines for risk accountability	.905	
	O3	existence of risk management function	.902	
	O4	existence of risk team to coordinate risk activities	.901	

	O5	existence of process for internal audit to coordinate and facilitate risk management activities	.919	
	O6	existence of risk champions in business units to coordinate risk activities	.906	
	O7	existence of third party professional service provider for risk management activities	.938	
Risk based audit and project success	RG1	the achievement of strategy objectives	.985	**.986**
	RG2	delivering projects on time and budget	.985	
	RG3	improvement of understanding of key risks and their wider implications	.985	
	RG4	issuance of consolidated reports of disparate risk at board level	.985	
	RG5	Identification of projects' risks	.985	
	RG6	sharing the projects' risks cross the departmental/sections	.985	
	RG7	increasing of management focus on the key issues	.985	
	RG8	fewer surprises and crisis in projects	.985	
	RG9	more focus on efficiency of projects phases (the ability to implement the projects successfully without waste)	.985	
	RG10	more focus on effectiveness of projects phases (more focus internally on doing the right things in the right time)	.985	
	RG11	Capability to take on critical risks in order to get greater reward	.985	
	RG12	reassurance of adequate evaluation of risks	.985	
	RG13	reassurance of adequate implementation of risk management processes	.985	
	RG14	better organizational redness	.985	
	RG15	Increased project control to maximize efficiency	.985	
	RG16	more informed risk-taking and decision-making	.985	
	RG17	early identification and understanding of internal and external issues pertaining to projects	.985	
	RG18	increased likely of delivering projects on scope, on time, and on budget	.985	
	RG19	ensure interdependent risks are managed	.985	
	RG20	adoption of risk-based audit has enabled optimal utilization of financial resources	.985	
	RG21	risk based audit has increased the accountability	.985	
	RG22	continuously monitoring and assessing the stakeholder's expectation	.985	

	RG23	continuously reporting the key risks dashboard to board and executives	.985	
	RG24	helping board/committees to the risk oversight responsibility	.985	
	RG25	ability to identify the emerging risks associated with strategic plans	.985	
	RG26	risk based audit helps to identify the risk appetite adequately	.985	
	RG27	improved ability to execute strategic plans	.985	
	RG28	fewer operational surprises	.986	
Occurrence of negative events	IN1	our organization is experiencing schedule delays	.919	**.922**
	IN2	our organization is experiencing cost overrun	.918	
	IN3	lack of control over the projects phases	.914	
	IN4	our organization experienced projects failure in the past	.918	
	IN5	governance model fails to manage key projects	.911	
	IN6	existence of unresolved issues and disputes	.914	
	IN7	lack of independent monitoring of progress	.910	
	IN8	lack of reporting to board and executives	.910	
	IN9	our organization is experiencing failure to achieve the business objectives	.913	
	IN10	loss of opportunity cost of doing the wrong projects	.913	
Internal Audit Function	IAF1	Provide independent assurance on risk management processes	.841	**.834**
	IAF2	Acts as catalyst in establishing a formal risk management program.	.831	
	IAF3	Actively participate /facilitate in implementing risk management program	.829	
	IAF4	Provide consulting and advice on risk management practices	.834	
	IAF5	Internal audit should not intervene in risk management processes	.859	
	IAF6	Provides assurance through written reports covering how key risks are managed	.833	
	IAF7	Provides assurance through written audit reports over the entity-wide risk management process	.834	
	IAF8	Review the organization’s risk appetite	.833	
	IAF9	Provide assurance on the organizational policies for risk management processes	.830	
	IAF10	Provide assurance on risk management strategy	.832	

	IAF11	Review the Implementation risk responses on management's behalf	.837	

As seen in the table above, all the variables highlighted are within acceptable limits and align with the study requirements. Indeed, most of them had Cronbach alpha indices that were closer to 1 as opposed to 0. Since the variables had high coefficients, it is correct to deduce that the items analysed had shared covariance. From the same statistic, it could also be deduced that they were all measuring the same research issue. This statement stems from the fact that the general rule of thumb in analysing the reliability of SPSS data states that the Cronbach alpha should be higher than 0.8. Conversely, many analysts consider scales that have less than 0.5 Cronbach alpha to be unacceptable. Based on the above findings, it is important to point out that all the values highlighted above showed relatively similar levels of co-efficiency.

Risk based audit and project success emerged as having the highest Cronbach value of 0.986. This number means that it had the highest internal consistency out of all the variables sampled in the study. "Risk appetite" had the second highest Cronbach alpha of 0.978, meaning that it had the second highest internal consistency, followed by risk management and governance, risk appraisal and insight, risk development and decision, strategy, risk culture, risk decision and process implementation, ownership, Occurrence of negative events, and financial and technical capacity, in that order. Collectively, the items complete a list of variables with an internal consistency higher than 0.8.

Moreover, it could be evidently observed that in most cases the obtained Cronbach alpha indexes are greater than 0.95. From a certain perspective, this fact may indicate the redundancy of the scale items (in case of this research, questions from the questionnaire). Therefore, it is essential to justify the high intercorrelation between these items. The questionnaire was developed on the basis of the proposed conceptual framework that determined the structure of the research. According to this framework, the determinants of risk governance appear to be very closely connected as they represent a set of closely related factors that often influence each other reciprocally along with their cumulative impact on the overall process of risk governance. Therefore, it is difficult to analyse these variables in significant separation from one another. Accordingly, the calculation of Cronbach alpha indicates a very close interrelation between the majority of the scale items, which is justified by the nature of the concepts included in the questionnaire.

Lastly, since all the determinants of risk governance highlighted above have a high internal consistency, it is correct to assume that there was no distortion of the measurement process and that there were consistent outcomes. However, this finding does not imply the lack of systematic errors in the study because the Cronbach alpha mostly focuses on the internal consistency of the variables and not necessarily on guaranteeing the non-existence of errors.

7.4 Descriptive Method

As mentioned above the findings highlighted in this research were generated after analysing the views of the research participants using the SPSS technique. This software package offers researchers different types of data analysis frameworks, such as bivariate statistics, prediction of numerical outcomes, group identification, geospatial analysis, GUI (R extension) and descriptive statistics, to analyse data. The researcher used the descriptive method to perform an independent analysis of the research variables to understand how they influenced the risk governance framework of the organization and the effectiveness of the projects. This method only highlights the basic features of the data set. Based on the descriptive nature of the data collection method, the findings presented in this research will be simple summaries of the respondent’s views. The goal of employing this data analysis technique is to assess the quantitative descriptions of the research variables in a manageable way.

As mentioned earlier the researcher collected the information that was subject for review using the survey method. The review focused on 148 variables, including control variables such as job level, experience, education, age, gender and nationality. The respondents gave their views using a questionnaire as the main data collection instrument. The survey had four main sections. The first one sought to find out the respondents' opinions about the determinants of risk governance framework. The second part of the analysis included a survey of the research participants' views about the influence of risk-based audit processes on the success of organizational projects, while the third part of the investigation sought to find out the occurrence of negative events on project success. The last part of the analysis involved an examination of the role of internal audit functions in risk management. Firstly, the demographic variables analysed in the study included six key measures: age, educational experience, job level, gender and nationality. These variables are analysed below.

Table 7.4 – Demographic Variables

Demographic Variables	Job Level	Experience	Education	Age	Gender	Nationality
Employee	36%					
Middle Management	33.3%					
Top Management	30.7%					
0 – 2		3.5%				
3 – 5		6.1%				
6 - 10		27.2%				
11- 19		47.4%				
20 or above		15.8%				
High school or less			0			
College degree			15.8%			
Higher Diploma / Bachelor degree			42.1%			
Masters			33.3%			
Doctorate or above			8.8%			
Less than 24				0.9%		
25 - 30				15.8%		
31 - 40				51.8%		
41 – 50				25.4%		

51 or above				6.1%		
Male					65.8%	
Female					34.2%	
UAE National						55.3%
Non-UAE National						44.7%

7.4.1 Job Level:

The job levels of the employees sampled were categorized into three key groups: employee level, middle-level management, and top-level management. The lowest level (employee level) accounted for 36% of the respondents sampled. Comparatively, 33.3% of the research participants were in middle-level management, while 30.7% of them were in top-level management. The distribution of employees across these job levels appears in figure 7.1 below.

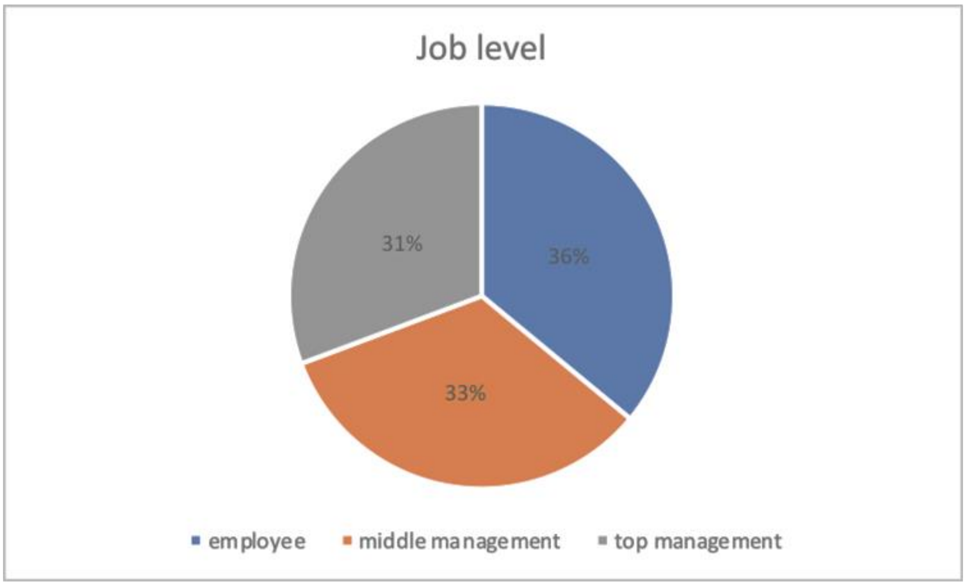


Figure 7.1. Job Level

The above data shows that the findings of the study represent all the employees in the organization because the three job levels are not differentiated by more than 6 points. In other words, there is an almost equal number of lower level, middle-level and top-level employees who took part in the study. The lowest employee group (employee-level) comprised the largest cohort of participants in the study. This view implies that a majority of the employees support the decisions that come from the study because top-level managers are usually fewer than lower-level employees. The opposite scenario would be problematic for the study because if top-level managers were the majority of the respondents, it would be easy to criticize the findings based on the view that this employee group is not representative of most people in the organization (by virtue of the number of employees in working in the organisation). Generally, it could be assumed that all three job levels identified in the study provided a balanced representation of the participants' views.

7.4.2 Work Experience

The employees' work experiences were evaluated with regard to how they fit into five key groups. The first one was comprised of employees who had up to two years of work experience. They were 3.5% of the sample. The second group of employees was comprised of those who had between 3 to 5 years of experience and they comprised of 6.1% of the sample. Comparatively, employees who had 6-10 years of work experience were 27.2%, while those who had 11-19 years of experience were 47.4% of the total population sampled. The last category of employees comprised the majority group of respondents. Those who had more than 20 years' worth of work experience comprised of 15.8% of the sample.

Based on these statistics, most of the employees sampled had 11-19 years of work experience, while the smallest group of employees who took part in the study had less than 2 years of work experience. This finding appears in figure 7.2 below.

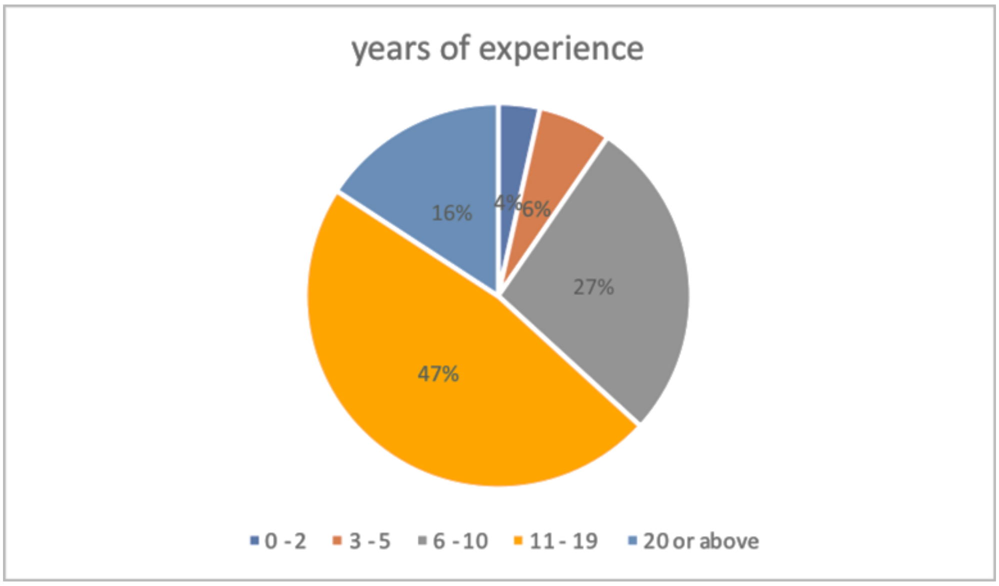


Figure 7.2. Years of Work Experience

The pie chart highlighted above shows that the employees who had 11-19 years of work experience accounted for most of the responses in the study. This category of personnel was useful to the study because they may have answered the research questions from a point of knowledge about the organization's activities. Their institutional memory of work processes was also instrumental in understanding the relationship between risk governance processes in the organization and the realization of project objectives in the firm. If this percentage is added to the number of employees who had more than 20 years of work experience, the total percentage of research participants who had more than a decade's worth of work experience equals to 66% of the sample. This statistic implies that most of the respondents sampled had a lot of work experience to support their views in the study.

7.4.3 Education Level

The education levels of the employees sampled in the study were categorized into five groups that included high school (or less), college degree, higher diploma/bachelor degree, masters, and doctorate (or above). Those who had a higher diploma or bachelor's degree were the majority because they comprised 42.1% of the sample population. The second biggest educational group of respondents was made up of employees who had a master's degree. They were 33.3% of the total sample. The third biggest group of respondents was comprised of college-educated employees and they accounted for 15.8% of the respondents surveyed. Employees who had a doctorate degree (or above) were 8.8% of the total number of research participants. No respondent had a high school diploma (or less). These findings are summarized in figure 7.3 below.

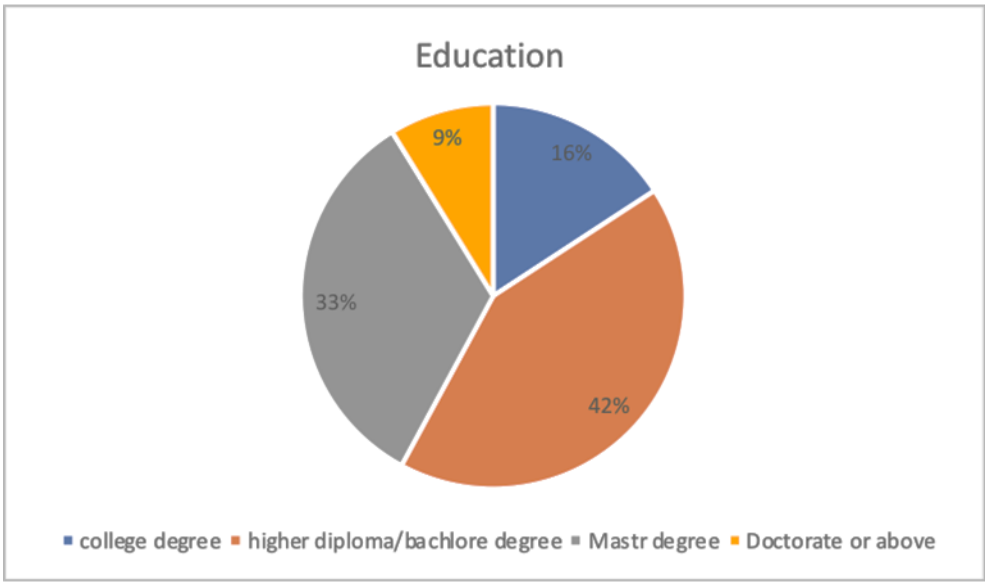


Figure 7.3. Education levels

According to the pie chart highlighted above, most of the respondents sampled had a bachelor's degree and above. The absence of employees who had a lower education level than that means that all the participants sampled were well educated. The pie chart above also shows that at least one-third of the employees sampled had a master's education. This finding adds to the narrative that all the employees were highly educated. The existence of an 8.8% sample population of respondents who had a doctorate degree also means that some of the respondents had "very high" education levels. Collectively, these percentages imply that their responses were reliable because they were given from an educated point of view. The presence of 8.8% of the employees with "very high" education levels in the study also means that the investigation included different perspectives of workers who had the highest level of academic degree and possibly of the relationship between risk governance and project objectives.

Therefore, these variations in education levels provide a balanced understanding of the respondents' views.

7.4.4 Age

The research participants were also stratified according to age differences. There were five key categories of this variable. They comprised of employees who were 24 years (or lower), 25-30 years, 31-40 years, 41-50 years, and older than 51 years. A majority of the respondents were aged between 31 and 40 years. They comprised 51.8% of the total sample. The second biggest age group was comprised of employees aged between 41 and 50 years. They accounted for 25.4% of the total sample. The third largest age group of employees was comprised of those aged between 25 and 30 years. They were 15.8% of the total sample. Employees who were aged 51 years (or more) were 6.1% of the sample population, while the smallest group of employees was comprised of workers younger than 24 years. They constituted 0.9% of the total sample. A summary of the employee segmentation by age appears in figure 7.4 below.

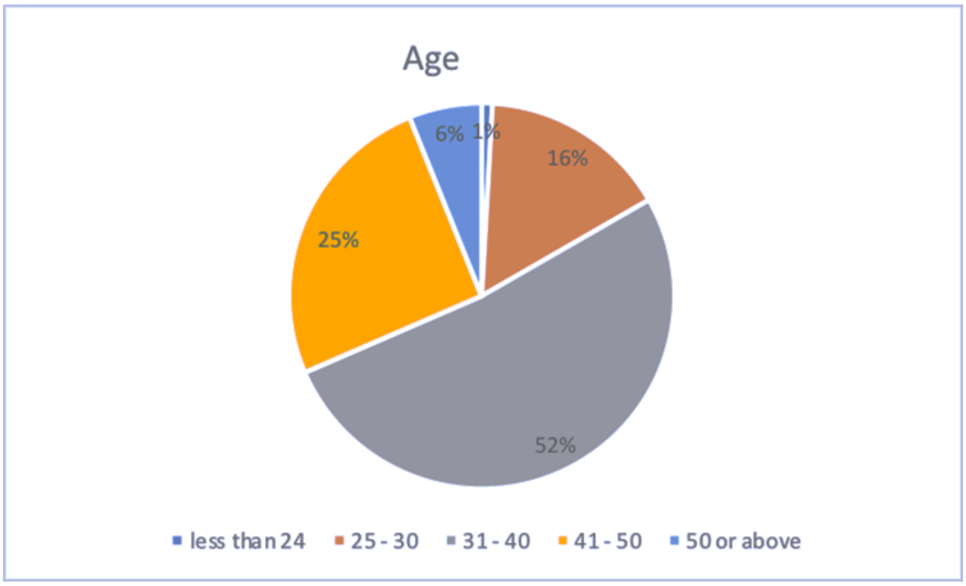


Figure 7.4. Age Variations

The variations in age highlighted in the pie chart above indicate the inclusion of different generational differences in the findings gathered from the study. Based on the percentages mentioned above, it is plausible to assume that most of the respondents were middle-aged. By relying on the common understanding that young people are aged between 15-35 years, the findings above show that the respondents provided a balanced representation of the views of both the younger and older employees. This analysis makes it easy to extrapolate the findings of the study across different generational cohorts. Furthermore, it means that the views presented by the respondents provided different perspectives of employees in the workplace because older and younger workers often exude varying perspectives of risk management and governance issues. The multigenerational inclusion of respondents' views also draws attention to the minimization of conflict between different sets of employees in the workplace, which may hinder their understanding of the research questions or their representation of the research issues. The inclusion of a balanced view of responses from both the young and the old also signify the need to merge the effects of different communication styles on the study. Since both sets of employees communicate differently, the inclusion of the younger and older employees in the survey means that communication bias may have been minimized when asking the respondents to give their views about the influence of risk governance on project objectives. Lastly, the presence of a low percentage of participants (0.9%) who were younger than 24 years in the investigation means that the contribution of views from "inexperienced employees" was minimal.

7.4.5 Gender

There were more males than females who participated in the study. Comprehensively, the total male population sampled was 65.8%, while the total sample of female participants in the study was 34.2%. The differences appear in figure 7.5 below.

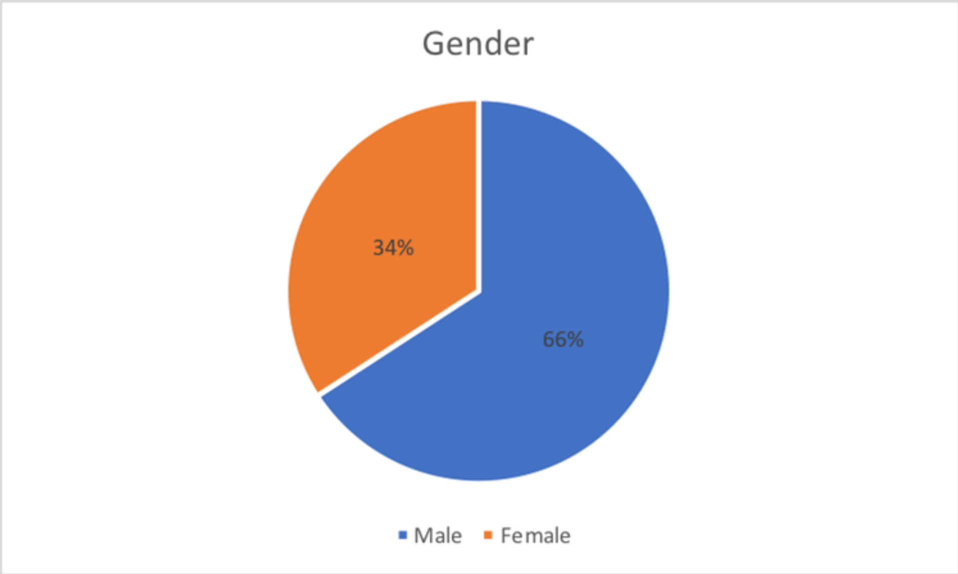


Figure7.5. Gender Differences

The aforementioned gender differences regarding how employees were sampled represent different views that male and female employees have about risk governance. The high number of male respondents in the study was not deliberate, but a fair representation of the gender differences in the workplace and their willingness to participate in the study. Nonetheless, someone could argue that the findings are gender biased because the percentage of male respondents was almost double that of female participants. However, this outcome was involuntarily achieved because there was no gender bias associated with the process of recruiting the research participants. Therefore, the differences represent the true picture of the workplace and, by extension, people's views regarding the influence of risk governance on project objectives.

7.4.6 Nationality

Nationality was the last demographic variable used to analyse the research sample. Two categories were used to segment the sample population: UAE nationals and non-UAE nationals. Those who met the first criterion were 55.3% of the total sample, while those who met the second category of employees were 44.7% of the respondents surveyed. Figure 7.6 below shows the distribution.

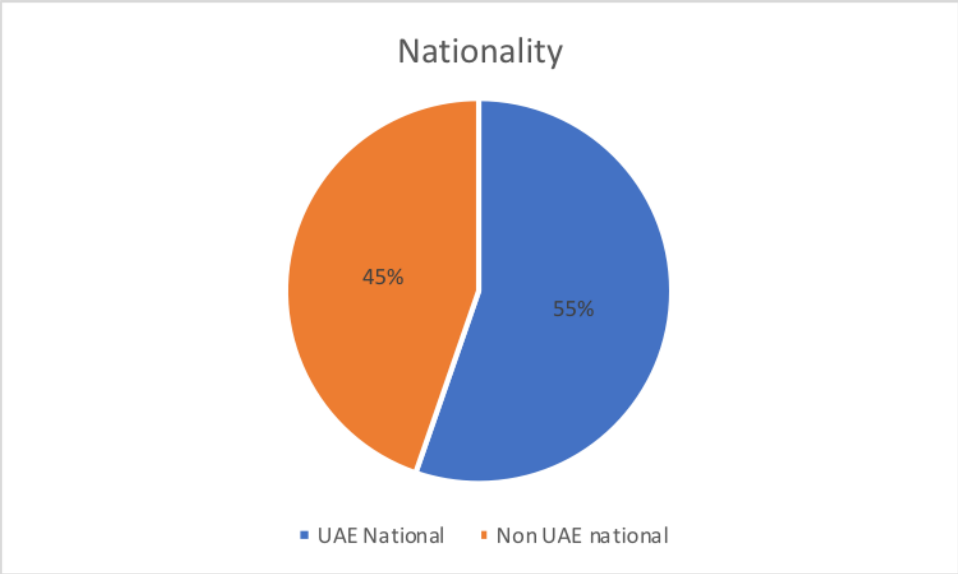


Figure 7.6. Nationality

The pie chart above shows that the difference between UAE nationals who participated in the study and those who did not share the same nationality was 10 points. This statistic means that most of the workers who participated in the study were UAE nationals. Its implication is that the views provided by the respondents were mostly contextual to the experiences of the UAE nationals. However, to the extent that 45% of the respondents were non-UAE, it could be assumed that there was a balanced representation of non-UAE views in the study as well. The implication of this analysis is that the findings derived from the research could not only be limited to the UAE context. It also means that it is easy to extrapolate the findings to the non-UAE context.

7.4.7 The Descriptive statistics of the variables:

Determinant 1: Strategy (S)

"Strategy" was the first determinant examined in relation to how it influenced the risk governance framework. During the investigation, the researcher asked the respondents to state whether their organizations had a process to align risks with objectives, an identification process for potential risks, a process for alignment of risk profile with business and capital management plans, and a procedure for integrating the risk management into the organization's strategic decision-making plan. Additionally, the research participants had to give their views regarding the existence of a risk oversight body, a mechanism for understanding and enforcement of risk practices, a process for compliance with regulatory requirements, an internal audit process to implement a formal risk management program, and a financial crisis impact drive to implement risk management programs in their organizations.

A majority of the respondents sampled said that "strategy" was "likely" a key part of their organizations' risk management processes. The mean percentage of respondents who held this view was 37%. A significant number of respondents also held "neutral" views about the likelihood of the above strategy existing in their organizations' processes. Broadly, this group of respondents amounted to 26% of the total sample. Comparatively, a significant percentage of respondents said "strategy" "unlikely" existed in their organizations or "very likely" existed in their workplaces. The mean percentage of respondents who held these views were 16% and 18%, respectively. Generally, a majority of the respondents said that the variables associated with strategy likely existed in their workplaces.

The following table 7.5 illustrates the descriptive statistics of strategy:

	Very unlikely	unlikely	neutral	likely	Very likely
S1	7	15.8	20.2	36.8	20.2
S2	4.4	19.3	16.7	43	16.7
S3	6.1	18.4	27.2	34.2	14
S4	7	15.8	25.4	36	15.8
S5	10.5	12.3	25.4	33.3	18.4
S6	7.9	17.5	25.4	34.2	14.9
S7	8.8	8.8	20.2	42.1	20.2
S8	7.9	14.9	18.4	35.1	23.7
S9	9.6	13.2	29.8	30.7	16.7

Table 7.5 Descriptive statistics of Strategy

Determinant 2: Risk Appraisal and Insight (RAI)

The second determinant analysed in the survey was risk appraisal and insight. The researcher analysed ten variables in this investigation. The first five involved an analysis of whether organizations had risk identification mechanisms, mechanisms for risk repository, qualitative risk assessment criteria, quantitative risk assessment criteria, and a mixed risk assessment criteria (both qualitative and quantitative). The presence of a mechanism for updating risk assessment frameworks, a process for regular quantification and aggregation of risks, guidelines for prioritization of risk management and control, a control framework calibrated in line with risk appetite, and the existence of guidelines for quantified of tolerance for loss or negative events were the last five variables investigated. Most of the respondents sampled said that these risk appraisal and insight techniques existed in their organizations. For example, the least percentage of respondents who said these variables likely existed in their organizations were 46% and they were referring to the existence of guidelines for quantified tolerance for loss or negative events. The rest of the variables had higher percentages of respondents who believed that the risk appraisal methods queried existed in their organizations. Coupled with the number of respondents who said that these methods “very likely” existed in their organizations, it is safe to conclude that a majority of the participants sampled believed that the aforementioned variables of risk appraisal and insight existed in their organizations. The following table 7.6 illustrates the descriptive statistics of Risk appraisal and insight:

	Very unlikely	unlikely	neutral	likely	Very likely
RAI1	7	13.2	19.3	39.5	21.1
RAI2	7.9	15.8	23.7	36.8	15.8
RAI3	6.1	14.9	20.2	42.1	16.7
RAI4	8.8	16.7	21.1	37.7	15.8
RAI5	7	15.8	23.7	38.6	14.9
RAI6	7	12.3	25.4	38.6	16.7
RAI7	10.5	15.8	20.2	39.5	14
RAI8	8.8	11.4	24.6	35.1	20.2
RAI9	7	15.8	23.7	41.2	12.3
RAI10	9.6	15.8	28.1	36	10.5

Table 7.6 descriptive statistics of Risk appraisal and insight

Determinant 3: Risk Decision and Process Implementation (RD)

The third determinant affecting risk governance that the researcher investigated in the study was the risk decision and process implementation. This determinant of risk performance had four variables. They included the presence of a procedure for grounding of risk in all business decisions, the existence of a mechanism for embedding risk optimization in strategic decisions, presence of procedures for executing core business processes and operations based on risk consideration, and the existence of a simple risk model as support business tools for decision-making. Most of the respondents sampled said that decision and process implementation tools "likely" existed in their organizations. Those who were "neutral" about the existence of the same tools formed the second biggest percentage of respondents, followed by those who thought these systems were "unlikely" to exist in their organizations. The least percentage of respondents said it was "very unlikely" that the risk decision and process implementation procedures existed in their organization. The mean percentage of those who thought this way was 6%. The average percentage of respondents who said such procedures "likely" existed in their organizations (the majority group) was 34%. Based on an evaluation of these percentages, it is correct to conclude that a majority of the respondents said the highlighted risk decision and process implementation processes existed in their organizations. The following table 7.7 illustrates the descriptive statistics of Risk decision and process implementation:

	Very unlikely	unlikely	neutral	likely	Very likely
RD1	6.1	21.9	24.6	32.5	14.9
RD2	6.1	23.7	21.9	33.3	14.9
RD3	8.8	18.4	23.7	35.1	14
RD4	7	18.4	25.4	40.4	8.8

Table 7.7 descriptive statistics of Risk decision and process implementation

Determinant 4: Risk Management and Governance (RMG)

The existence of risk management and governance processes in organizations was the fourth determinant of risk governance investigated in the research. Cumulatively, there were 19 variables associated with this determinant. The first four included the existence of risk management policies and procedures, the presence of support and sponsorship of the risk management process by the board and executive, and the existence of regulatory requirements to adopt risk management practices. Other variables investigated included the existence of a Chief Risk Officer position in their organizations, the presence of a formalized approach to address risks, the availability of guidelines to define the roles and responsibilities of risk staff, the availability of a risk communication mechanism, the existence of a whistle-blowing mechanism and the existence of ethics and code of conduct policies. Other variables analysed included the existence of guidelines for internal audit, the existence of a risk function, the availability of risk treatment plans, the presence of a process for risk identification, the presence of a process for identifying and monitoring key risk indicators and the availability of a regular risk communication framework supported by the board and senior management. The existence of a formal risk oversight authority, guidelines for risk internal control, guidelines for definition of risk accountability and ownership and procedures for fraud risk assessment were the last variables analysed in this segment of the analysis.

A general overview of the respondents' views on this determinant showed that a majority of them believed that Risk Management and Governance processes "likely" existed in their organizations. The average percentage of respondents who supported this view was 34%. The lowest number of respondents sampled said it was "very unlikely" that Risk management and Governance processes existed in their organizations. An average of 20% of the respondents held "neutral" views about this subject, while a mean percentage of 16% of the respondents said that such processes "very likely" existed in their organizations. Therefore, a comprehensive review of the findings shows that a majority of the respondents believed that Risk management and Governance processes existed in their workplaces. The following table 7.8 illustrates the descriptive statistics of Risk management and governance:

	Very unlikely	unlikely	neutral	likely	Very likely
RMG1	4.4	14	18.4	33.3	29.8
RMG2	6.1	9.6	22.8	40.4	21.1
RMG3	14	11.4	23.7	36	14.9
RMG4	16.7	21.9	19.3	26.3	15.8
RMG5	6.1	20.2	18.4	36.4	18.4
RMG6	8.8	18.4	21.1	36.8	14.9
RMG7	8.8	21.1	25.4	30.7	14
RMG8	13.2	21.9	27.2	22.8	14.9
RMG9	5.3	12.3	17.5	43	21.9
RMG10	4.4	14.9	21.1	38.6	21.1
RMG11	8.8	16.7	20.2	41.2	13.2

RMG12	4.4	7.9	20.2	42.1	25.4
RMG13	7.9	14	19.3	37.7	21.1
RMG14	7.9	14	19.3	37.7	21.1
RMG15	7.9	10.5	20.2	38.6	22.8
RMG16	7.9	13.2	21.1	39.5	18.4
RMG17	8.8	18.4	23.7	34.2	14.9
RMG18	7.9	17.5	32.5	28.9	13.2
RMG19	8.8	21.1	30.7	27.2	12.3

Table 7.8 descriptive statistics of Risk management and governance

Determinant 5: Review Risk Development and Decision (RRD)

Another determinant investigated in the research involved a review of risk development and decision processes in organizations. The variables investigated involved an evaluation of whether the respondents believed their organizations had an internal audit assurance framework for risk management, a process for ongoing update of risk assessment, a mechanism for independent assurance by a third party, guidelines for board/audit committee oversight processes, and a process for monitoring and reviewing the risk management framework. The respondents were also asked to state if they believed their organizations had guidelines for revision and reconstruction of risk management, a framework for periodic reporting on risk, a process for escalating and notifying risks to the relevant authority, a process for management and monitoring of risk exposures, and a documentation process supporting the same. A majority of the respondents (45.9%) said their organizations had a documentation process. However, an analysis of the general opinions of the participants reveals that most of them believed their organizations "likely" practiced periodic reviews of risk development and included them in their decision-making processes. Only an average of 7% of the respondents believed that it was "very unlikely" that such processes did not exist in their organizations. This percentage shows that most organizations review their risk development processes and reflect the same findings in their decision-making processes. The following table 7.9 illustrates the descriptive statistics of Review Risk development and decision:

	Very unlikely	unlikely	neutral	likely	Very likely
RRD1	7	12.3	21.1	36	23
RRD2	4.4	13.2	27.2	30.7	24.6

RRD3	7.9	14	27.2	30.7	20.2
RRD4	9.6	14.9	29.8	29.8	15.8
RRD5	8.8	21.9	17.5	37.7	14
RRD6	9.6	22.8	21.9	34.2	11.4
RRD7	8.8	17.5	25.4	34.2	14
RRD8	8.8	15.8	29.8	36	9.6
RRD9	8.8	10.5	24.6	42.1	14
RRD10	3.5	14.9	19.3	43.9	18.4

Table 7.9 descriptive statistics of Review Risk development and decision

Determinant 6: Risk Communication (RC)

In the questionnaire, the researcher also analysed risk communication as a determinant of risk governance. Relative to this investigation, a majority of the respondents said their organizations had a risk communication framework. In fact, most of them said their workplaces had guidelines outlining how to coordinate risk management activities as well as provisions for appointing risk champions from business units. In both of these variables, a mean percentage of 39.5 of the respondents said the processes “likely” existed in their organizations. No other variable attracted a similar percentage of views. This response rate referred to the perception of the research participants about 12 variables highlighted in the study. The variables explored the possibility of an existence of a process for risk communication, a process for promoting transparency in the organization, guidelines for coordinating risk management activities, rules for appointing risk champions from the business unit, a risk awareness initiative, and procedures for internal communication of amount, and type of risk to accept and manage. The researchers were also asked to state whether their organizations had processes for external communication to promote transparency and accountability, guidelines for monitoring and reporting of performance against risks, a risk register, a risk heat map (or dashboard indicating risk portfolio), key risk indicators report and an aggregated quantitative risk exposure report. Broadly, a majority of the respondents said these risk communication covariates “likely” existed in their organizations. The following table 7.10 illustrates the descriptive statistics of Risk communication:

	Very unlikely	unlikely	neutral	likely	Very likely
RC1	7.9	21.9	23.7	28.1	18.4
RC2	7.9	19.3	24.6	36	12.3
RC3	7.9	19.3	20.2	39.5	13.2
RC4	13.2	13.2	21.1	39.5	13.2
RC5	8.8	15.8	18.4	36	21.1
RC6	9.6	16.7	24.6	37.7	11.4
RC7	11.4	21.1	26.3	31.6	9.6
RC8	10.5	16.7	26.3	31.6	14.9
RC9	8.8	14.9	16.7	31.6	28.1
RC10	7.9	16.7	21.1	32.5	21.9
RC11	7	21.1	8.4	33.3	20.2
RC12	8.8	20.2	25.4	30.7	14.9

Table 7.10 descriptive statistics of Risk communication

Determinant 7: Risk Culture (RCU)

Risk culture was also investigated as another key determinant of risk governance. The respondents were asked to state whether their organizations had set guidelines for promoting accountability, a risk awareness program, guidelines for internal audit to promote the risk culture, procedures for risk management training, a process for risk culture audit, a program for talent development, a framework for fostering risk understanding, and formal training processes for risk awareness and fraud. The biggest percentage of the respondents acknowledged the presence of guidelines for promoting sustainability. The mean percentage of those who felt this way was 37.7%. No other variable had such a high approval rate. Most of the respondents also acknowledged some type of risk culture in their organizations because a majority of them said the variables highlighted above “likely” existed in their workplaces. An average of 13% of the respondents had a strong conviction that a risk culture existed in their organizations because they said most of the variables highlighted in the organization “very likely” existed in their workplaces. Therefore, it is possible to deduce the fact that a majority of the respondents either believed a risk culture “likely” or “very likely” existed in their organizations. Nonetheless, the percentage of respondents who said the processes “likely” existed was larger. The following table 7.11 illustrates the descriptive statistics of Risk culture:

	Very unlikely	unlikely	neutral	likely	Very likely
RCU1	10.5	11.4	29.8	37.7	10.5
RCU2	7	19.3	21.1	36.8	15.8

RCU3	6.1	14	22.8	35.1	21.9
RCU4	10.5	16.7	23.7	36.8	12.3
RCU5	20.2	11.4	22.8	32.5	13.2
RCU6	12.3	17.5	23.7	36	10.5
RCU7	9.6	17.5	27.2	32.5	13.2
RCU8	14.9	18.4	27.2	28.1	11.4

Table 7.11 descriptive statistics of Risk culture

Determinant 8: Financial and Technical Capacity (F)

The researcher also sampled the respondents' views regarding the financial and technical capacity of their organizations. Five variables were analysed to explore how this determinant influenced risk governance. They included an evaluation of the presence of a mechanism for allocating adequate capital to manage risk, a framework for acquiring skills and management capability, the existence of human skills, financial resources, and risk technology. A majority of the respondents sampled acknowledged the existence of a strong financial and technical capacity in their organizations. Within the majority, most of them said their organizations had adequate human skills. The least number of respondents sampled said it was "very unlikely" that their organizations had a strong financial and technical capacity. A mean of 15% of the respondents also answered in the affirmative because they said their organizations "very likely" had the financial and technical strategies discussed. The following table 7.12 illustrates the descriptive statistics of |Financial and technical capacity:

	Very unlikely	unlikely	neutral	likely	Very likely
F1	6.1	13.2	35.1	32.5	13.2
F2	7	16.7	27.2	38.6	10.5
F3	5.3	13.2	23.7	41.2	16.7
F4	4.4	6.1	29.8	38.6	21.1
F5	12.3	14.9	17.5	40.4	14.9

Table 7.12 descriptive statistics of Financial and technical capacity

Determinant 9: Risk Appetite (RA)

Another determinant investigated in the study was risk appetite. The respondents were asked to state whether different variables associated with the risk appetite were present in their organizations. The variables analysed sought to establish whether a risk appetite framework, a risk appetite statement, an understanding of the current risk capacity, a periodic review of risk appetite limit, frequent reviews of risk appetite, and a synchrony of the risk appetite between the management board existed in the respondents' organizations. The investigation also spread out further to establish whether organizational functions, a framework for communicating risk appetite tolerance, a reporting process that indicates when risk thresholds are reached, and a framework for integrating risk management into the organization's performance framework also existed in their workplaces.

Broadly, a majority of respondents said most of the risk appetite processes mentioned in the questionnaire existed in their organizations. Averagely, 33% of the respondents felt this way. A significant percentage of the respondents (25%) also held "neutral" views about the existence of such risk appetite processes in their organizations. The least percentage of respondents said it was "very likely" that their organizations had the specific risk appetite processes questioned in their organizations. This finding was different from most of the other determinants investigated in this research because the least percentage of respondents so far sampled believed the risk determinants "very unlikely" existed in their organizations. However, in this determinant, the least percentage of respondents were in the category of respondents who said it "very likely" existed in their organizations. The following table 7.13 illustrates the descriptive statistics of Risk appetite:

	Very unlikely	unlikely	neutral	likely	Very likely
RA1	11.4	18.4	23.7	33.3	13.2
RA2	12.3	17.5	23.7	30.7	15.8
RA3	11.4	14	24.6	36.8	13.2
RA4	13.2	15.8	28.9	32.5	9.6
RA5	11.4	19.3	23.7	37.7	7.9
RA6	12.3	16.7	29.8	31.8	9.6
RA7	9.6	19.3	29.8	29.8	11.4
RA8	11.4	15.8	28.9	33.3	10.5
RA9	12.3	14.9	30.7	33.3	8.8

Table 7.13 descriptive statistics of Risk appetite

Determinant 10: Ownership

When the respondents were asked to give their views about the presence of risk ownership processes in their organizations, a majority of them said such ownership processes “likely” existed in their organizations. This finding was similar to other responses given in this study when investigating the presence of other risk determinants because those who said they “likely” existed in the organization were the majority again. The mean percentage of respondents who held the same view about the risk ownership process was 37%. The least percentage of respondents sampled said the risk ownership processes questioned “very unlikely” existed in their organizations. This finding means that most of the organizations where the respondents came from “likely” had a risk ownership process. Nonetheless, an interesting finding seen from this analysis is the high number of respondents who were almost evenly spread across all the response options when answering about the existence of a third-party service provider for risk management activities. In other words, the number of participants who said this variable “existed” and “did not exist” in their organizations was almost equal. Generally, compared to other determinants sampled in the study, the risk ownership determinant had the highest distribution of responses. The following table 7.14 illustrates the descriptive statistics of risk ownership:

	Very unlikely	unlikely	neutral	likely	Very likely
O1	7.9	14.9	27.2	38.6	11.4
O2	8.8	12.3	27.2	41.2	10.5
O3	9.6	12.3	25.4	34.2	18.4
O4	8.8	15.8	21.1	39.5	14.9
O5	8.8	14	23.7	39.5	14
O6	9.6	17.5	21.9	35.1	15.8
O7	21.9	12.3	29.8	23.7	12.3

Table 7.14 descriptive statistics of ownership

Factor 10: Risk based Audit and Project Success

The second part of the investigation (Part B) involved an analysis of the contribution of risk audit processes to the realization of organizational project objectives. The respondents were asked to give their views regarding different aspects of this risk determinant. Comprehensively, they gave their views about how risk audit processes influenced their organizations’ strategic objectives, project time and budget, understanding of key risks, identification of project risks, reporting of risk patterns, risk sharing across multiple departments, redirection of management's focus on the important issues, led to fewer surprises and risk crises, and led to the efficiency of their organizations. Coupled with other variables, the research participants collectively responded to 28 variables.

The biggest percentage of respondents sampled said it was "likely" that risk-based audit processes contributed to their organization's project objectives and success. The mean percentage of respondents who answered this way was 43%. Within this majority, there was a greater consensus among the respondents that the risk audit process led to an improved ability to execute operational plans. About 52% of the respondents (within the majority group) felt this way. The percentage of respondents who held neutral views about the influence of the risk determinant on the realization of their operational goals was almost equal to the percentage of respondents who said it was "very likely" the audit process helped in the realization of their organizational strategic objectives. The difference in mean percentage between both sets of respondents was 2%. Nonetheless, comprehensively, this determinant (audit process) also followed the same pattern of responses as that observed in other determinants of risk governance because the biggest percentage of respondents fell in the "likely" group (similar to how they responded to the other determinants). The following table 7.15 illustrates the descriptive statistics of Risk audit and project success:

	Very unlikely	unlikely	neutral	likely	Very likely
RG1	1.8	9.6	17.5	46.5	24.6
RG2	1.8	7	22.8	44.7	23.7
RG3	2.6	9.6	20.2	47.4	20.2
RG4	5.3	10.5	27.2	33.3	23.7
RG5	1.8	9.6	21.1	43	24.6
RG6	2.6	18.4	26.3	33.3	19.3
RG7	0.9	10.5	21.9	42.1	24.6
RG8	1.8	12.3	26.3	41.2	18.4
RG9	1.8	10.5	27.2	42.1	18.4
RG10	0.9	10.5	27.2	43.9	17.5
RG11	1.8	13.2	29.8	36.8	18.4
RG12	1.8	13.2	23.7	40.4	21.1
RG13	2.6	11.4	22.8	44.7	18.4
RG14	1.8	8.8	35.1	37.7	16.7
RG15	1.8	7	22.8	48.2	20.2
RG16	2.6	9.6	25.4	43.9	18.4
RG17	0.9	12.3	19.3	47.4	20.2
RG18	0.9	11.4	18.4	46.5	22.8

RG19	2.9	13.2	23.7	39.5	21.1
RG20	1.8	9.6	22.8	42.1	23.7
RG21	0.9	7.9	24.6	43	23.7
RG22	1.8	8.8	28.1	41.2	20.2
RG23	3.5	10.5	25.4	36.8	23.7
RG24	3.5	7.9	26.3	38.6	23.7
RG25	2.6	10.5	20.2	45.6	21.1
RG26	0.9	10.5	26.3	43	19.3
RG27	2.6	8.8	14.9	52.6	21.1
RG28	0.9	9.6	26.3	42.1	21.1

Table 7.15 descriptive statistics of risk audit and project success

Factor 12: Occurrence of Negative Events

The third part of the questionnaire sought to understand the respondents' views about the impact of varied negative events on their organizations. Several adverse events were investigated. They included an experience of schedule delays, an experience of cost over-runs, a lack of control over project phases, an experience of project failure, an inability of the governance model to manage key projects, and the experience of unresolved issues and disputes. The lack of independent monitoring and progress, the failure to report to the management board and executives, the failure of an organization to achieve business objectives, and the lost opportunity cost of doing the wrong project are other variables investigated in the study. The biggest group of respondents sampled said the variables were "unlikely" to have an effect on their organizations. The mean percentage of respondents who held this view was 32%. The second largest group of respondents said the variables sampled "likely" had an effect on their organizations. The mean percentage was 27. The third largest group of respondents held "neutral" views about the research statements and their mean percentage was 26. Those who held extreme views about the research issue ("very likely" and "very unlikely") formed the smallest percentage of respondents. The following table 7.16 illustrates the descriptive statistics of occurrence of negative events:

	Very unlikely	unlikely	neutral	likely	Very likely
IN1	6.1	17.5	28.9	36.8	10.5
IN2	3.5	18.4	25.4	39.5	13.2
IN3	5.3	38.6	24.6	21.1	10.5
IN4	3.5	25.4	25.4	27.2	18.4
IN5	4.4	30.7	38.6	18.4	7.9

IN6	3.5	38.6	21.1	27.2	7
IN7	6.1	38.6	21.1	27.2	7
IN8	11.4	29.8	24.6	23.7	10.5
IN9	13.2	36	28.9	13.2	8.8
IN10	5.3	28.1	28.1	22.8	14.9

Table 7.16 descriptive statistics of occurrence of negative events.

Factor 13: Internal Audit Functions (IAF)

The fourth part of the survey sought to find out the respondents' views about the role of internal audit functions in their organizations in terms of risk management process. In line with this subject matter, they were asked to rate how specific aspects of their internal audit functions influenced their risk management processes. The internal audit functions investigated included the provision of independent assessments on risk management processes, the establishment of a formal risk management program, a support for the implementation of a risk management program, and the provision of consultancy and advice on risk management processes. The interference of internal audit processes on risk management processes, an assurance of how risk management processes will be handled, the provision of assurance through written audit reports about the entity-wide risk management process, and revision of the organization's risk appetite, are other variables that were also investigated in this section.

The largest group of respondents sampled said that the internal audit functions mentioned above were "important" to their risk management functions. About 36% of the respondents felt this way. The second largest group of research participants said that the internal audit processes were "very important" to their risk management processes. The mean percentage of respondents who thought this way was 34. The lowest percentage of respondents said the internal audit process was "very unimportant" to their organizations. This percentage of respondents was the lowest in the study (4%). Furthermore, in two variables sampled, none of the respondents said that internal audit processes were "unimportant" to their risk management process. The two variables were the provision or consultancy and risk advice practices and the provision of assurances through written reports covering how key risks are managed. Generally, a majority of the respondents sampled said that the internal audit process was instrumental in the proper functioning of their risk management processes. The following table 7.17 illustrates the descriptive statistics of internal audit function:

	Very unimportant	unimportant	Neutral	important	Very important
IAF1	0.9	4.4	22.8	32.5	39.5
IAF2	0.9	5.3	21.9	34.2	37.7
IAF3	0.9	6.1	21.9	34.2	36.8
IAF4	0	5.3	16.7	40.4	37.7
IAF5	7.9	7.9	27.2	28.9	28.1
IAF6	0	4.4	21.1	38.6	36
IAF7	0.9	3.5	21.1	38.6	36
IAF8	13.2	9.6	16.7	35.1	25.4
IAF9	11.4	10.5	17.5	29.8	30.7
IAF10	10.5	6.1	19.3	34.2	29.8
IAF11	14.9	9.6	23.7	28.9	22.8

Table 7.17 descriptive statistics of Internal audit function

7.5 Factor Analysis

Factor analysis was employed to extract critical factors in the questionnaire that explain risk governance determinants. According to Jackson (2015), factor analysis applies in the design of a valid and reliable scale because it extracts the most significant factors from observed data that explain a construct of interest. In the analysis of observed data, factor analysis employed maximum likelihood as an extraction method. Denis (2016) expounds that maximum likelihood is expedient because it permits computation of varied indexes, determination of significance of factor loadings, and calculation of confidence intervals and correlations. Factor analysis was done on 10 scales in the questionnaire, namely, strategy (S), risk appraisal and insight (RAI), risk management and governance (RMG), review risk development and decision (RRD), risk communication (RC), risk culture (RCU), risk appetite (RA), risk-based audit and project success (RG), Impact of negative events (IN) and Internal audit function (IAF).

KMO, Bartlett’s, and Cronbach’s alpha tests were determined and tabulated in the following table (Table 7.18).

Variables	**Kaiser-Meyer-Olkin (KMO)**	**Bartlett’s Test**	**Cronbach Alpha**	**No. of items**

Strategy (S)	.922	.000	.940	9
Risk appraisal and insight (RAI)	.937	.000	.970	10
Risk Management and Governance (RMG)	.939	.000	.974	19
Review risk development and decision (RRD)	.929	.000	.959	10
Risk Communication (RC)	.913	.000	.951	12
Risk Culture (RCU)	.911	.000	.940	8
Risk Appetite (RA)	.951	.000	.978	9
Risk Governance and Project Success (RG)	.944	.000	.986	28
Impact of negative events (IN)	.884	.000	.922	10
Internal Audit Function (IAF)	.817	.000	.834	11

Table 7.18: Tests for KMO, Bartlett, and Cronbach's alpha

KMO statistics for all variables are greater than 0.8, which means that the sample sizes are adequate for factor analysis. Field (2014) states that KMO values between 0.8 and 0.9 indicate a good sampling adequacy, whereas those greater than 0.9 exhibits an excellent sampling adequacy. Bartlett's test indicates statistical significance, which means that the correlation matrix is dissimilar to the identity matrix (Pallant 2016). Cronbach's alpha indicates that internal consistency of items is within a good level (0.8-0.9) and perfect level (above 0.9) for the reliability of the questionnaire to be robust (McCormick et al. 2017; Elliott & Woodward 2015). Thus, the following sections cover factor analysis of the ten scales in the questionnaire.

7.5.1 FACTOR ANALYSIS FOR STRATEGY (S)

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	6.170	68.555	68.555	5.862	65.128	65.128	5.153
2	.773	8.591	77.145	.434	4.818	69.946	4.932
3	.559	6.214	83.360	.261	2.904	72.850	4.825
4	.424	4.716	88.076				

5	.332	3.685	91.760				
6	.247	2.750	94.510				
7	.190	2.108	96.618				
8	.160	1.773	98.390				
9	.145	1.610	100.000				

Table 7.19: Total variance explained for strategy

Factor analysis extracted, the first, second, and third factors with eigenvalues of 5.862, 0.434, and 0.261, which explained 65.13%, 4.82%, and 2.90% of variances correspondingly. figure 7.7 confirms that maximum likelihood extracted three factors as demonstrated by the inflection point of the scree plot.

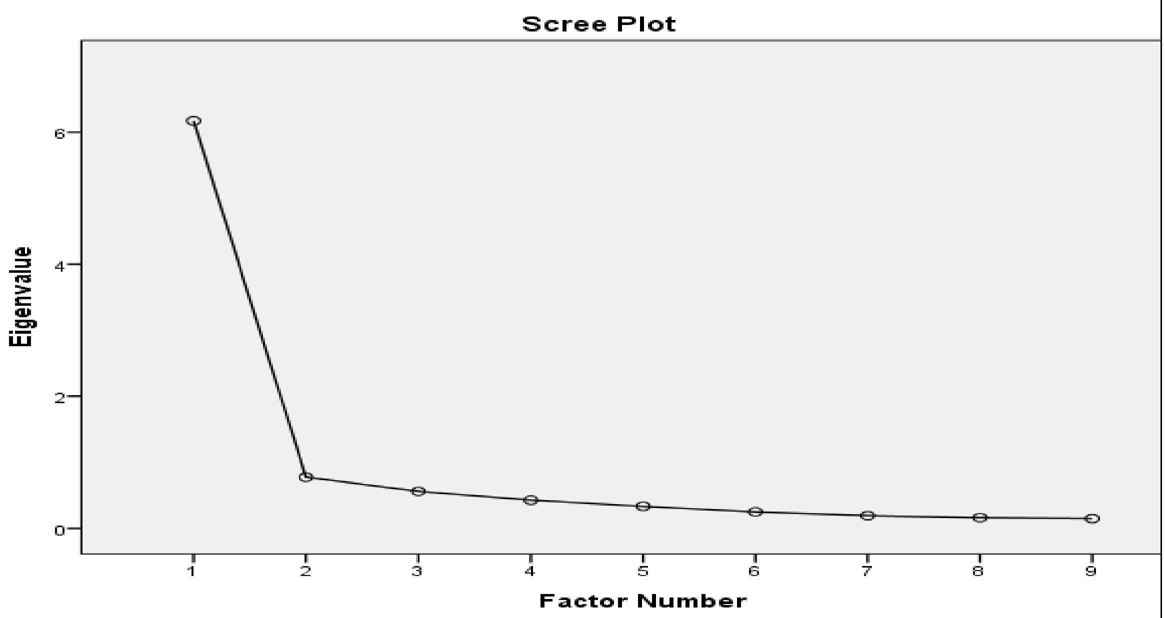


Figure 7.7: Scree plot of strategy

Pattern Matrix

	Factor		
	1	2	3
S3	.829		
S9	.685		
S4	.661		
S7		.719	
S5		.694	
S8		.628	
S6		.557	
S1			.849
S2			

Table 7.20: Pattern matrix for strategy

Table 7.20 above shows how each item loaded onto different latent clusters of Strategy (S). Three items, S3, S9, and S4, loaded onto the first latent variable with loadings of 0.829, 0.685, and 0.661 respectively. Four items, S7, S8, S6, loaded onto the second new latent variable with loadings of 0.719, 0.694, 0.628, and 0.557 in that order. Item S1 loaded onto the third latent variable with a loading of 0.849 and will be shifted to second new latent cluster.

Pattern Matrix							
Variable Code	Component		Cronbach Alpha	# of Items	New Code	New Description
	1	2				
S3	.829		.912	4	SG1	Risk alignment process
S9	.685					
S4	.661					
S1	.849					
S7		.719	.863	4	SG2	Risk oversight practices
S5		.694				
S8		.628				
S6		.557				

Table 7.21: Pattern matrix for strategy with new codes

The Table 7.21 depicts two latent clusters of Strategy (S):

- Four items, S1, S3, S4, and S9, are highly reliable as they loaded on the first latent cluster with Cronbach's alpha of 0.912.
- Four items, S5, S6, S7, and S8, are highly reliable for they loaded onto the second latent cluster with Cronbach's alpha of 0.863.

In summary, Table 7.21 illustrates that four items that loaded onto the first latent cluster were coded as a new item (SG1), while the other four items that loaded onto the second latent cluster were coded as a new item (SG2).

The interpretation of the (2) new latent clusters is provided below:

7.5.1a - Risk alignment process - SG1

Risk alignment process (SG1) is a new cluster derived from nine factors of strategy. It comprises two components of the strategy that explains 68.03% of its variance. The first component with three items accounts for 65.13% of the variance, whereas the second component with one item accounts for 2.9% of the variation. Collectively, the four items are highly reliable in predicting risk alignment process as an aspect of strategy in risk governance. Risk alignment involves synchronisation of operations and activities in an organisation to meet objectives, performance measures, and strategies employed by organisations in risk management. In their study in the banking industry, Sheedy and Griffin (2017) established that infrastructure, culture, and strategy are three factors, which require synchronisation for organisations to achieve optimal performance in risk management. Infrastructure offers a supportive foundation for risk managers to implement risk management operations and activities. Culture promotes synchronisation for it encourages risk managers to follow established procedures and practices in their roles and responsibilities while exercising risk governance. The strategy provides a framework for implementing risk management successfully in an organisation. Thus, alignment is critical in risk governance because it optimises interventions of risk management.

The examination of questionnaire reveals that risk alignment process entails S1, S3, S4, and S9 items. The questionnaire shows that alignment of risks with strategic objective, risk profile with capital management, risk management with strategic decision-making, and financial crisis with risk management plan are main strategies that organisations should utilize in risk governance. Smith (2016) argues that the inability to align risk interventions in organisations does not only reduce the capacity to manage risks but also increases the occurrence and impacts. Organisations without risk alignment do not achieve optimal performance of their operations and activities due to incoordination and confusion emanating from conflicting processes. Organisations with poor risk alignment processes are characterized by inefficiencies, incoordination, inflexibility, and disintegrated operations and activities. Sheedy and Griffin (2017) recommend risk managers to streamline their operations by creating risk alignment process. Therefore, it is evident that organisations cannot forgo risk alignment process in managing risks that threaten their objectives.

7.5.1b - Risk oversight practices - SG2

Risk oversight practices (SG2) forms a new cluster derived from nine items of strategy in risk governance framework. It constitutes a single component that explains 4.82% of the variation in strategy. The component comprises four factors that are highly reliable in predicting risk oversight practices in risk governance framework. Lyons (2015) defines risk oversight practices as interventions of enterprise risk management (ERM), which the board of directors undertakes in the management of risks. Oversight practices of risks entail identification, assessment of impacts, mitigation of occurrences and effects, and review of the efficacy of interventions. Lyons (2015) established five layers of defence in ERM, namely, the board, the executive management, the internal assurance, tactical oversight, and operational oversight, which helps the board of directors to manage risks effectively. The inclusion of tactical and operational layers of defence into the conventional three-layered model of defence has enhanced the capacity of organisations to undertake risk oversight practices.

The examination of questionnaire shows important themes that related to risk oversight practices applied in the development of strategies in risk governance. The existence of oversight body, the mechanism for comprehending risk practices, the process for regulatory compliance, and the internal audit process are major factors that explain risk oversight practices. These factors are in line with the findings of Lyons (2015), which shows that risk oversight practices should occur in various layers of organisations ranging from the management level to operational level. Organisations with widespread oversight practices have enhanced the ability to manage and control risks. Vecchiato (2015) recommends organisations to define oversight responsibility of the board, improve risk intelligence, assess risk appetite, align risk identification with interventions, evaluate the capacity of risk governance, and inform stakeholders about risk process. These recommendations capture risk oversight practices that organisations have to adopt and implement for effective management of risks. Thus, risk oversight practices promote the capacity of organisations to overcome challenges that are dominant in turbulent environments.

7.5.2 FACTOR ANALYSIS FOR RISK APPRAISAL AND INSIGHT

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	7.859	78.585	78.585	7.267	72.667	72.667	7.173
2	.381	3.811	82.396	.235	2.348	75.015	6.571
3	.364	3.643	86.040	.662	6.616	81.631	6.393
4	.322	3.224	89.263				
5	.275	2.750	92.013				
6	.219	2.192	94.205				
7	.197	1.968	96.173				
8	.180	1.799	97.973				
9	.123	1.228	99.201				
10	.080	.799	100.000				

Table 7.21: Total variance explained for risk appraisal and insight

Through the method of maximum likelihood, factor analysis extracted 1, 2, and 3 factors with eigenvalues of 7.267, 0.235, and 0.662, which explained 72.67%, 2.35%, and 6.62% respectively. Nevertheless, the scree plot shows extraction of two factors with a significant impact on risk appraisal and insight.

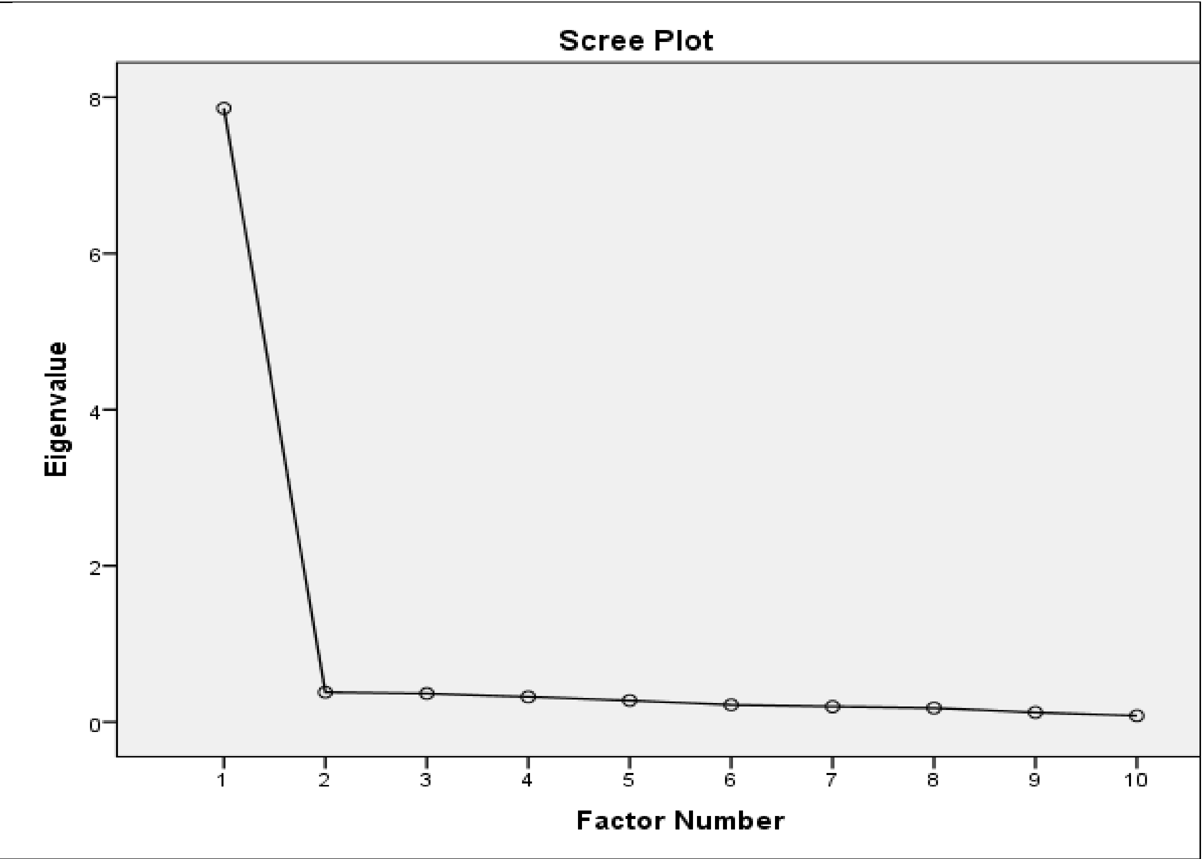


Figure 7.9: Scree plot for risk appraisal and insight

Pattern Matrix

	Factor		
	1	2	3
RAI9	.948		
RAI8	.689		
RAI1	.683		
RAI2	.646		
RAI10	.562		
RAI3			
RAI4		1.009	
RAI5		.477	
RAI7			
RAI6			.977

Table 7.22: Pattern matrix for risk appraisal and insight

Pattern matrix (Table 7.22) indicates that five items, RAI9, RAI8, RAI1, RAI2, and RAI10, loaded onto latent cluster 1 with 0.948, 0.689, 0.683, 0.646, and 0.562 loadings respectively. Two items, RAI4 and RAI5, loaded onto the second latent cluster with 1.001 and 0.477 loadings in that order. RAI6 is the only one item that loaded onto the third latent cluster with a loading value of 0.977 and will be shifter to second latent cluster.

Pattern Matrix						
Variable Code	Component 1	Component 2	Cronbach Alpha	# of Items	New Code	New Description
RAI9	.948		.937	5	RAIG1	Risk Guidelines
RAI8	.689					
RAI1	.683					
RAI2	.646					
RAI10	.562					
RAI4		1.009	.936	3	RAIG2	Risk assessment process
RAI5		.477				
RAI6		.977				

Table 7.23: Pattern matrix for risk appraisal with new codes

The table 7.23 depicts the two new latent clusters:

- Five items, RAI1, RAI2, RAI8, RAI9, and RAI10, are significantly reliable because they loaded onto the first latent cluster with Cronbach's alpha of 0.937.
- Three items, RAI4, RAI5, and RAI6, are significantly reliable for they loaded onto the second latent cluster with Cronbach's alpha of 0.936.

In recap, Table 7.23 shows that the five items in component one was coded as a new item (RAIG1), while the three items that loaded onto the second component were coded as a new item (RAIG2).

The interpretation of the (2) new latent clusters is provided below:

7.5.2a - Risk Guidelines - RAIG1

Risk guideline (RAIG1) is a new cluster derived from 10 items of risk appraisal and insight. It explains 72.267% of the variation in risk appraisal and insight. Risk guidelines encompass five factors, namely, RAI1, RAI2, RAI8, RAI9, and RAI10, which are highly reliable for they loaded onto a single component. Risk guidelines are central to risk management for they provide framework, principles, and process for managing risk in diverse organisations. The nature of risk guidelines determines their effectiveness in the management of risks. Evidently, organisations with comprehensive risk guidelines manage their risks successfully. The International Organisation for Standardisation formulated ISO 31000, which stipulates risk guidelines aimed at boosting the capacity of organisations to manage risks (Cooper et al. 2014). The ISO guidelines provide a concise, simple, and clearer process for organisations to expedite their risk management regarding planning and decision-making. The ISO focuses on the principles of risk management, integration into all operations, iteration of risk management, and streamlining of processes.

Risk guidelines are essential in the management of risk for they provide framework, principles, and processes that are not only effective but also promote standardisation of operations and activities. Bergstrom and Frykmer (2016) employed complexity theory in asserting that an analytical framework comprising dimension, scope, and resolution systems form the basis of risk management guidelines. The integration of risk guidelines into the analytical framework offers a robust way of streamlining and synchronising operations and activities. According to ISO 31000, organisations ought to formulate empirical guidelines and feasible principles, which guide risk managers on how to manage diverse risks. The existence of clear and concise risk guidelines eliminates ambiguity and obscurity in the process of risk management. The absence of risk guidelines creates confusion and reduces synergy of auditors for they would perform uncoordinated tasks, which hinder effective management of risks. Thus, the cluster of risk guidelines is critical in the assessment of the capacity of organisations to undertake effective risk governance.

7.5.2b - Risk assessment process - RAIG2

Risk assessment process (RAIG2) is a new second cluster derived from 10 items of risk appraisal and insight. It comprises two components explaining 2.348% and 6.616% of the variation in risk appraisal and insight. The first component has two factors, RAI14 and RAI15, whereas the second component has one factor, RAI16. These components collectively explain 8.964% of the variation in risk appraisal and insight. Risk assessment process is an established method of risk management that allows risk managers to identify risk and formulate effective mitigation measures. In risk assessment, risk managers should identify risks, recognise vulnerable project objectives, determine the potential occurrence, provide a comprehensive report, and offer a continual review (Aven 2016). Identification of risk is the primary role of risk managers for it enables them to comprehend the nature and magnitude of impending impacts. Since risks have huge impacts on certain project objectives considered as weak points in an organisation, recognition of these objectives improves preparedness. The determination of potential occurrence aids in evaluation of the magnitude of the impacts, and thus, forms the basis of developing effective migration measures. Given that risk assessment process provides important information about risks, organisations require a detailed report for risk managers to examine, develop mitigation measures, and undertake a constant review.

Normally, risk assessment process entails the quantitative and qualitative risk analysis. The quantitative risk analysis considers risks, which have considerable effects on project objectives, whereas the qualitative risk analysis considers all risks identified in a given project. In the qualitative risk analysis, risk managers employ scientific and mathematical models in predicting the occurrence and the impacts of risk on respective projects in organisations. In contrast, risk managers apply expert judgment in the qualitative risk analysis to determine the occurrence and impacts of risks. Due to the increasing importance of the risk assessment process, modern organisations have integrated enterprise risk management in their boards (Viscelli, Beasley & Hermanson 2016). Risk management boards with established risk assessment process are effective in risk governance.

8.5.3 FACTOR ANALYSIS FOR RISK MANAGEMENT AND GOVERNANCE

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	13.146	69.190	69.190	12.828	67.513	67.513	12.172

2	1.176	6.188	75.378	.868	4.570	72.083	11.048
3	.924	4.862	80.240				
4	.521	2.741	82.981				
5	.479	2.523	85.503				
6	.416	2.189	87.692				
7	.314	1.655	89.347				
8	.286	1.507	90.854				
9	.274	1.444	92.298				
10	.256	1.346	93.645				
11	.233	1.225	94.870				
12	.223	1.171	96.041				
13	.180	.946	96.987				
14	.140	.735	97.722				
15	.122	.640	98.362				
16	.103	.542	98.904				
17	.093	.489	99.393				
18	.070	.366	99.760				
19	.046	.240	100.000				

Table 7.24: Total variance explained for risk management and governance

In Table 7.24, the extracted factors had eigenvalues of 12.828 and 0.868 for the first and second factors, which explained 67.51% and 4.57% of the variation in risk management and governance respectively. However, the scree plot (Figure 7.9) demonstrates that four factors provide a significant influence on the variation of data.

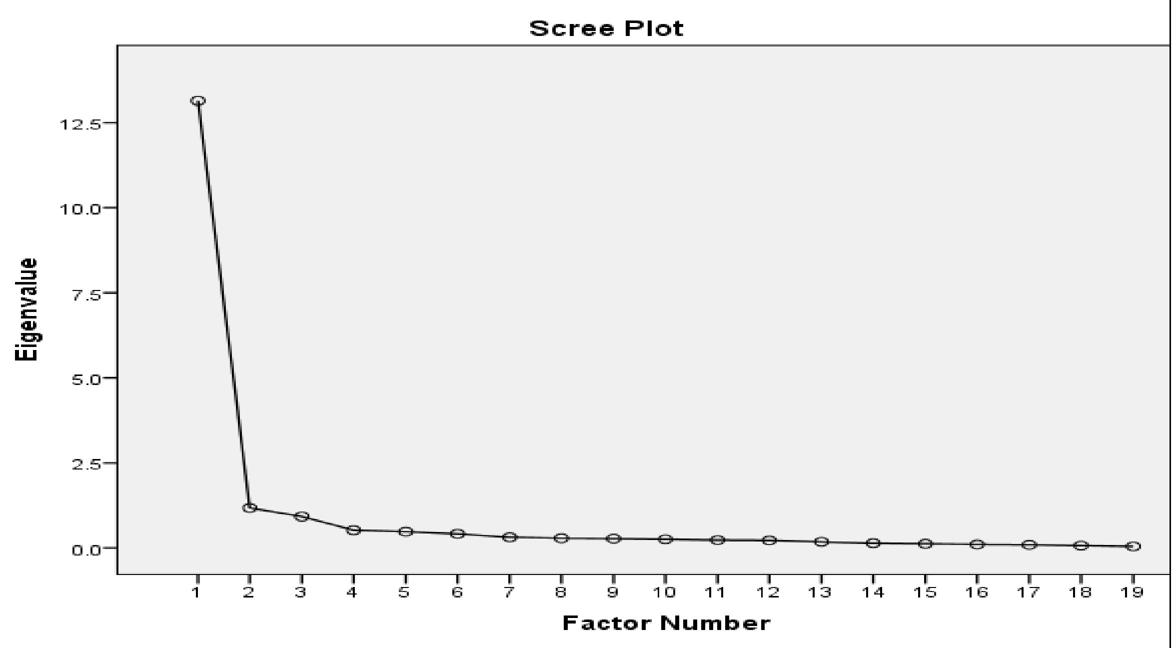


Figure 7.9: Scree plot for risk management and governance.

Pattern Matrix

Variable Code	Component 1	Component 2	Cronbach Alpha	# of Items	New Code	New Description
RMG15	1.031		.970	12	RMGG1	Risk Governance
RMG14	.978					
RMG1	.946					
RMG2	.800					
RMG16	.794					
RMG9	.781					
RMG12	.725					
RMG13	.696					
RMG5	.632					
RMG6	.610					
RMG10	.528					
RMG11	.453					
RMG3		.863	.931	7	RMGG2	Risk Control
RMG19		.859				
RMG8		.826				
RMG18		.717				
RMG7		.633				
RMG17		.558				
RMG4		.558				

Table 7.25: Pattern matrix for risk management and governance with new codes

The table 7.25 depicts the new latent clusters:

- Twelve items, RMG1, RMG2, RMG5, RMG6, RMG9, RMG10, RMG11, RMG12, RMG13, RMG14, RMG15, and RMG16, are highly reliable for they loaded onto the first latent cluster with Cronbach's alpha of 0.97.
- Seven items, RMG3, RMG4, RMG7, RMG8, RMG17, RMG 18, and RMG19, are highly reliable for they have Cronbach's alpha of 0.931.

In summary, the twelve items in the first latent cluster were coded into a new variable (RMGG1), whereas the seven items in the second latent cluster were coded into a new variable (RMGG2)

The interpretation of the (2) new latent clusters is provided below:

7.5.3a - Risk Governance- RMGG1

Risk governance (RMGG1) is a new cluster emanating from 19 items in the questionnaire, which explains risk management and governance. It constitutes a single component with 12 factors, which are highly reliable in predicting the occurrence of risk governance in an organisation. Fundamentally, risk governance comprises regulations, rules, processes, conventions, and mechanisms that organisations employ in the management of risks. Stulz (2016) undertook a study in the banking industry and established that risk governance entails identification, measurement, aggregation, management, and monitoring of risks. The establishment indicates that risk governance is a process that requires proficient coordination of operations and activities in line with the prevailing management practices. Organisations grapple with the challenge of identifying, measurement, and aggregation of risks for they operate in dynamic environments. Once they have assessed risks, risk managers design strategies and processes of preventing, eliminating, mitigating, and avoiding risks. For sustainable risk governance, organisations have to undertake a review of risks continuously.

The assessment of the items in the questionnaire reveals important themes in risk governance. The existence of a support system and formalised approach to risk governance enables organisations to manage risks appropriately. Moreover, the existence of stipulated rules and regulations and elaborate policies and code of conduct is essential for employees to perform their duties and roles diligently. As accountability is a management matter that determines ownership of responsibilities, risk managers have to ensure that there are relevant mechanisms and procedures for employees to adhere (Stulz 2016). The existence of the internal auditing mechanism strengthens the capacity of risk managers to undertake risk governance. The auditing mechanism enables risk managers to streamline and synchronise their operations and activities in tandem with the dominant practices. In their study, Escuder-Bueno and Halpin (2016) found out that risk identification, evaluation, and prioritisation are crucial pillars that support risk governance in various organisations. The implication is that organisations ought to establish risk management process as the foundation of risk governance.

7.5.2b Risk Control - RMGG2

As a new cluster, risk control (RMGG2) emanates from 19 items of risk management and governance. It constitutes a single component with seven factors that explain 4.57% of the variation in risk management and governance. Risk control is an elaborate process that organisations employ in managing risks. It entails operations and activities that organisations undertake in implementing interventions, monitoring of progress, identifying new risks, and the assessment of risk process efficacy. Risk managers deploy various strategies in risk control, which include avoidance of risk, prevention of loss, reduction of loss, separation from risks, duplication of resources, and diversification of organisational functions (Aven 2016). The avoidance of risk is the most effective approach to risk control because it reduces the probability of a risk occurring to naught. The prevention and reduction of loss apply in instances where the occurrence of a risk is inevitable, and the only available option is to mitigate their occurrence and impacts. The separation and duplication is a strategy that allows managers to reduce risks and their impacts on organisations. Since risks have different impacts on various objectives or sections of organisations, diversification of projects minimises their impacts when they occur.

In the questionnaire, it is apparent that seven items highlight themes of risk control in risk governance framework. The existence of regulatory requirements is important in risk control for it provides a legal framework that supports interventions and practices of risk managers. Given that firms consist of stakeholders and the management teams, communication mechanisms are essential for it promotes the effectiveness of the decision-making process. Whistleblowing mechanism and fraud risk assessment are interventions to risk control that help in preventing corruption and supporting accountability among employees in an organisation. The existence of a formal oversight authority such as the board of directors or risk management board ensures the implementation of strategies successfully (Lyons 2015). Risk control requires an oversight body to supervise and management operations and activities involved in the management of risks. Brustbauer (2016) avers that risk control is a strategy that enables small- and medium-sized enterprises to control risks and become competitive in global markets. Hence, risk control is an integral predictor of risk management and governance in modern organisations.

7.5.4 FACTOR ANALYSIS FOR REVIEW RISK DEVELOPMENT AND DECISION

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	7.330	73.299	73.299	7.085	70.849	70.849	6.072
2	.697	6.970	80.269	.391	3.911	74.760	6.000
3	.450	4.501	84.770	.319	3.188	77.948	6.401
4	.393	3.930	88.700				
5	.300	2.999	91.699				
6	.245	2.445	94.145				
7	.199	1.990	96.134				
8	.152	1.523	97.657				
9	.138	1.377	99.034				
10	.097	.966	100.000				

Table 7.26: Total variance explained for review risk development and decision

The extracted factors (1, 2, and 3) had eigenvalues of 7.085, 0.391, and 0.319 explaining 70.85%, 3.91%, and 3.19% of the variation in review risk development and decision correspondingly. The scree plot (Figure 7.10) confirms that the three extracted factors explain significant variation in review risk development and decision.

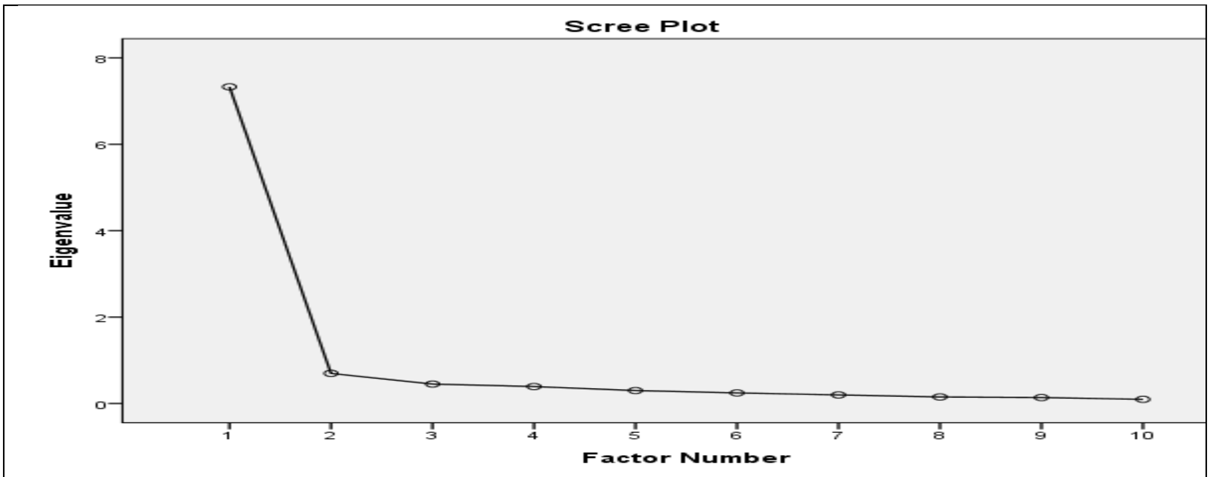


Figure 7.10: Scree plot for review risk development and decision

Pattern Matrix

	Factor		
	1	2	3
RRD6	.943		
RRD5	.866		

RRD4			
RRD1		.778	
RRD3		.758	
RRD2		.690	
RRD9			.934
RRD10			.629
RRD8			.593
RRD7			

Table 7.27: Pattern matrix for review risk development and decision

The pattern matrix (Table 7.27) depicts how different items load onto three latent clusters based on their loadings. Out of the 10 items in RRD scale, RRD6 and RRD5 loaded onto the first latent cluster, RRD1, RRD3, and RRD2, loaded onto the second latent cluster, and RRD9, RRD10, and RRD8 loaded onto the third latent cluster.

	Pattern Matrix							
Variable Code	Component			Cronbach Alpha	# of Items	New Code	New Description
	1	2	3				
RRD6	.943			.924	2	RDG1	Risk monitoring guidelines
RRD5	.866						
RRD1		.778		.857	3	RDG2	Effectiveness assurance
RRD3		.758					
RRD2		.690					
RRD9			.934	.924	3	RDG3	Monitoring of risk exposure
RRD10			.629				
RRD8			.593				

Table 7.28: Pattern matrix for review risk development and decision with new codes

In Table 7.28:

- The first latent cluster has two items, RRD6 and RRD5, exhibiting an excellent level of the reliability with a Cronbach's alpha of .924
- The second latent cluster has three items, RRD1, RRD3, and RRD2, depicting a high level of the reliability with Cronbach's alpha of .857.
- The third latent cluster has three items, RRD9, RRD10, and RRD10, showing an excellent level of the reliability.

As a summary, the two items in the first latent cluster were coded into a new variable (RDG1). The three items in the second latent cluster were coded into a new variable (RDG2), whereas those in the third latent cluster were coded into a new variable (RDG3).

The interpretation of the (3) new latent clusters is provided below:

8.5.4a - Risk monitoring guidelines– RDG1

Risk monitoring guidelines (RDG1) is a new cluster extracted from 10 factors of risk review risk development and decision. It comprises one component with two factors, which are highly reliable in explaining review risk development and decision. The two factors explain 70.85% of the variation in risk development and decision. Risk monitoring guidelines offer procedures, processes, and principles of analysing, evaluating, and tracking risks in an organisation. As risks vary over time, risk monitoring is necessary for real-time assessment and management. Scott et al. (2016) explain that the function of risk monitoring is to track the occurrence of risks and determine the efficacy of strategies that organisations deploy in risk management. According to Kaplan and Mikes (2016), risk monitoring guidelines direct risk managers to determine if risks have changed, interventions are still reliable, and previous assumptions apply. In risk monitoring, risk managers can undertake a continuous or re-assessment process to keep abreast with dynamic nature of risks in organisations.

Since risk monitoring is an active process, it entails identification and evaluation of risks for effective implementation of interventions. Essentially, risk-monitoring guidelines stipulate how risk managers identify and evaluate risks in their respective organisations. When risk managers identify risks and draft action plan for managing them, they apply monitoring process in checking and tracking the implementation process of interventions to guarantee efficacy and success. The monitoring process permits the collection of data for risk managers to analyse and generate essential information employed in risk management. Once there is an elaborate risk management plan, risk-monitoring guidelines arise to ensure that there is a meticulous implementation of risk interventions. In a case analysis, Kaplan and Mikes (2016) found out that continuous monitoring of risk is an integral ingredient for effective management of risks. From the questionnaire, it is apparent that the two factors of risk monitoring entail the existence of the formal process of addressing risks and guidelines that define roles and responsibilities of risk managers. The formal process empowers risk managers to create action plans and manage risks effectively. Guidelines that define roles and responsibilities direct risk managers in their operations and activities aimed at handling risks meritoriously.

8.5.4b - Risk effectiveness assurance – RDG2

Risk effectiveness assurance (RDG2) is the second novel cluster generated from ten items of review risk development and decision. It comprises three factors, which accounts for 3.91% of the variation in review risk development and decision. Risk effectiveness assurance is a method that allows risk managers to assess risks and determine the capacity of interventions to assure effectiveness. The ability of a response to be effective in the management of risks is dependent on the quality assurance standards established by organisations. Davis (2017) explains that effective quality assurance in risk management is the one that considers dynamic changes in organisations and updates in standards. The board of directors ought to identify gaps in risk management, determine the capacity of the present interventions, and provide recommendations in a detailed report. In essence, the effectiveness of quality assurance determines how organisations response to diverse risks they encounter.

Risk effectiveness assurance is apparent in the questionnaire as different factors or items explain different themes, as exhibited in RRD1, RRD2, and RRD3. In the questionnaire, the apparent theme related to risk effectiveness assurance is the presence of the internal audit assurance. In assessing the role of audit committee, Haji and Anifowose (2016) found out that the internal assurance is significant to risk management because it empowers organizations to monitor and control their risks because they cause huge impacts. Owing to the dynamic nature of risks, the questionnaire captures the essence of an ongoing update of risk assessment. Davis (2017) explains that continuous update of quality assurance standards is necessary to keep abreast with changing risks and interventions. Additionally, the external assurance is essential to complement the internal mechanism. An independent body should undertake the external assurance to avert biases, which would influence the assessment and management of risks. Therefore, risk effectiveness assurance is an indispensable element in risk governance for it promotes standards of quality assurance.

8.5.4c– Monitoring of risk exposure – RDG3

As the third novel cluster derived from ten factors of RRD, monitoring of risk exposure (RDG3) is a vital variable in risk governance. RDG3 has three items, RRD8, RRD9, RRD10, which account for 3.19% of the variation in review risk development and decision. Fundamentally, monitoring of risk exposure is a continuous process of risk management. The main purpose of monitoring of risk exposure is to track identified risks, evaluate the existence of residual risks, and establish new risks (Bernklau 2016). Risk monitoring is an active process throughout the lifetime of a project or organisations. Changes and the emergence of new forms of risks require risk managers to update processes and procedures utilized in risk management. In monitoring risk exposure, risk managers aim to determine if reviews of risks are up to date, there is compliance with risk management practices, and contingency reserves are adequate.

Risk monitoring entails numerous operations and activities involving risk management. Boubaker, Buchanan, and Nguyen (2016) categorise monitoring of risk exposure as identification, risk analysis, risk control, measurement, and communication. Since risks are dynamic, risk managers have a constant task of assessing and determining if new risks have emerged in various projects. The identified risks need analysis to ascertain the degree of potential impacts and provide appropriate management interventions. For effective management of risks, control mechanisms are crucial for the sustainability of the risk management process. The management has to measure all risks align their impacts with available resources and interventions. Communication is an integral element in the monitoring of risk exposure for it enables risk managers to communicate their assessments and offer relevant mitigation measures. In the questionnaire, various themes of monitoring of risk exposure are apparent. The existence of escalating process, management process, and documentation allows the management to monitor risks reliably. Thus, monitoring of risk exposure provides real-time information, which helps the management to make informed decisions on when to implement contingency plans, take corrective actions, and change project objectives.

7.5.5 FACTOR ANALYSIS FOR RISK COMMUNICATION

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	7.872	65.603	65.603	6.909	57.577	57.577	6.618
2	1.270	10.584	76.187	1.091	9.095	66.672	6.143
3	.522	4.352	80.539	.970	8.080	74.752	6.367
4	.471	3.926	84.466				
5	.413	3.444	87.909				
6	.347	2.892	90.801				
7	.301	2.504	93.305				
8	.230	1.921	95.226				
9	.187	1.560	96.786				
10	.170	1.414	98.200				
11	.117	.973	99.173				
12	.099	.827	100.000				

Table 7.29: Total variance explained for risk communication

Factor analysis extracted three factors with eigenvalues of 6.909, 1.091, and 0.970, which accounted for 57.58%, 9.09%, and 8.08% of the variation in risk communication. The scree plot affirms that the three extracted factors are significant predictors of risk communication.

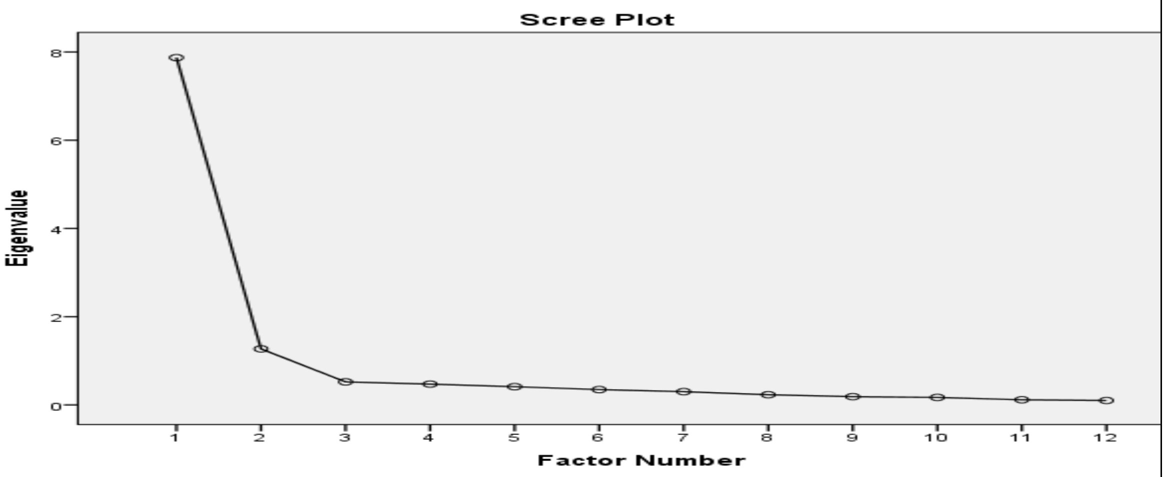


Figure 7.11: Scree plot for risk communication

Pattern Matrix

	Factor		
	1	2	3
RC7	.946		
RC8	.884		
RC5	.725		
RC2	.624		
RC6	.568		
RC10		.986	
RC9		.970	
RC12		.718	
RC11		.717	
RC3			1.000
RC4			.496
RC1			.487

Table 7.30: Pattern matrix for risk communication

The pattern matrix shows that the items load into three latent clusters with different loadings. Five items, RC2, RC5, RC6, RC7, and RC8, loaded onto the first latent cluster, while four items, RC9, RC10, RC11, and RC12, loaded onto the second latent cluster. Three items, RC1, RC3, and RC4, loaded onto the third latent cluster.

Pattern Matrix

Variable Code	Component			Cronbach Alpha	# of Items	New Code	New Description
	1	2	3				
RC7	.946			.903	5	RCG1	Risk Communication
RC8	.884						
RC5	.725						
RC2	.624						
RC6	.568						
RC10		.986		.932	4	RCG2	Risk documentation
RC9		.970					
RC12		.718					
RC11		.717					
RC3			1.000	.908	3	RCG3	Risk coordination
RC4			.496				
RC1			.487				

Table 7.31: Pattern matrix for risk communication with new codes

In Table 7.31:

- Five items, RC2, RC3, RC6, RC7, and RC8, are reliable because their Cronbach's alpha is excellent in the first latent cluster (0.932).
- Four items, RC9, RC10, and RC12, are reliable for their Cronbach's alpha is superb in the second latent cluster (0.903).
- Three items, RC1, RC3, and RC4, are reliable for their Cronbach's alpha is excellent in the third latent cluster (0.908).

  Therefore, factor analysis of risk communication indicates that the fives items of the first latent cluster were coded into a new variable (RCG1), whereas the four variables of the second latent cluster were coded into a new variable (RCG2). The three variables of the third latent cluster were coded into a new variable (RCG3).

The interpretation of the (3) new latent clusters is provided below:

7.5.5a- Risk Communication – RCG1

Risk communication (RCG) is a new cluster obtained from 12 items of risk communication. It forms a single component with five items that are highly reliable in predicting risk communication. Risk communication accounts for 57.58% of the explained variance by factor analysis. Risk communication entails sharing of information that is critical in the identification, assessment, and mitigation of risks. Since experts can identify, assess, and mitigate risks, they have to share information with various parties or stakeholders in organisations so that they can make informed choices regarding risk management strategies. The dynamic nature and the occurrence of risks require sustained communications to enhance the preparedness of parties involved in risk management. Eriksson (2016) holds that risk communication boosts strategies for monitoring hazards and improves the sustainability of risk management. When risk managers undertake an accurate assessment of risks and communicate appropriate information, they obtain optimum support from an organisation. Thus, risk communication is an indispensable aspect of risk management that allows organisations to undertake accurate monitoring of risks and intervention measures.

Risk communication encompasses different aspects of risk management as reflected in the questionnaire. Transparency is an important feature of risk communication for it allows everyone in an organisation to access and utilise information in risk governance. Given that communication can occur haphazardly, risk communication should occur in a system where there are formal procedures that differentiate internal and external communication. Moreover, the communication channels ought to discriminate information depending on their uses in risk management. The external communication is beneficial for it boosts transparency and accountability in risk governance. In risk management, assessment, monitoring, and reporting of risk analyses require effective communication. Arvai (2014) contends that risk communication is not a means of enlightening but a mechanism that supports enriching dialogue, which enables risk managers to access and utilise information in risk management. Thus, risk communication comprises mechanisms and processes that the management use in conveying and processing information.

7.5.5b - Risk documentation – RCG2

Risk documentation (RCG2) is the second cluster generated from 12 factors of risk communication in risk governance. It constitutes four factors that form a single component, and they explain 9.10% of the variation in risk communication. Since risk management entails identification, assessment, and review of risks, it requires documentation to allow storage and utilisation of information in risk management. For instance, risk assessment document has detailed information about risks in organisations. Risks managers study risk assessment document so that they can design appropriate interventions and mitigation measures. Risk documents act as sources of evidence for insurance companies and courts use them in determining liability. Proper risk documentation enables an organisation to get favourable premium rates of insurance and prevent costly lawsuits of negligence. In a documentary analysis, Higgins et al. (2016) noted that organisations differed in the way they analyse risks, undertake risk-assessment procedures, and implement risk management strategies. Through risk documentation, reviewers can determine the efficacy of risk-assessment methods and interventions.

The analysis of items that represent risks documentation shows that the existence of risk indicators report and aggregated risk exposure report are dominant themes. Risk documentation ought to have key risk indicators for they are essential in promoting monitoring and development of mitigation measures. In assessing project-based organisations, Khameneh, Taheri, and Erhadi (2016) concluded that risk reporting is one of the key performance indicators of risk management and performance. In essence, risk indicators report shows trends of risks over time, which have influenced the capacity of organisations to achieve their project objectives. By analysing risk indicators report, risk managers can predict the occurrence and impacts of risks on project objectives and outcomes. The assessment of risks generates aggregated risk report, which qualifies and quantifies risks in an organisation. An aggregated report forms the basis for designing and implementing evidence-based risk management strategies. Therefore, risk documentation is central to risk governance because it accumulates information that risk managers require to analyse and construct relevant and effective mitigation measures.

7.5.5c– Risk Coordination – RCG3

Another new cluster of risk communication is risk coordination (RCG3). It comprises three items, which explains 8.08% of the variation in risk communication. These factors are highly reliable in predicting the extent of risk communication that happens in organisations. Given that risk management involves different levels of management ranging from the board at the top to operational management at the bottom, there is a need to coordinate processes for effective management of risks in organisations. Lechner and Gudmundsson (2014) aver that risk coordination ensures synchronisation of operations and activities, resulting in optimised risk management. Risk management practices such as identification, assessment, and review of risks need well-organized coordination because they have concerted effects on risk management. According to Viscelli, Beasley, and Hermanson (2016), ERM is a system that allows organisations to coordinate risk management operations and activities for the board of directors can prioritise risks and launch appropriate responses to mitigate them. Therefore, the board of directors has a major role in coordinating ERM practices for effective and reliable management of risks in their organisations.

The existence of systems of risk management exhibits risk coordination in an organisation. From the questionnaire, risk communication is one of the factors that influence risk coordination. Communication promotes risk management because it allows risk managers to share vital information and design effective mitigation measures of risk. The existence of an elaborate communication mechanism within an organisation promotes risk management because the board of directors, managers, and employees can share information effortlessly. Additionally, the existence of guidelines for coordinating operations and activities is a factor that reflects risk coordination in an organisation. In their study, Xu and Berry-Stolzle (2018) highlight that ERM is an efficient system of coordinating risks for it integrates numerous interventions and strategies. Through risk coordination, the management delegates their responsibilities to appointed risk managers who can implement strategies for risk management as outlined in risk guidelines.

7.5.6 FACTOR ANALYSIS FOR RISK CULTURE

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	5.682	71.026	71.026	3.646	45.575	45.575	4.911
2	.596	7.450	78.476	2.297	28.712	74.287	4.822
3	.527	6.582	85.058	.349	4.367	78.654	3.877
4	.346	4.328	89.387				
5	.291	3.633	93.020				
6	.226	2.821	95.841				
7	.177	2.211	98.051				
8	.156	1.949	100.000				

Table 7.32: Total variance explained for risk culture

Factor analysis extracted three factors with eigenvalues greater than 0.5 from eight items that make up the scale of risk culture. The extracted factors, 1, 2, and 3, have eigenvalues of 3.646, 2.297, and 0.349, which accounted for 45.58%, 28.71%, and 4.37% of the variation in risk culture. The scree plot supports the extraction of the three factors for they have marked influence on the variation of risk culture.

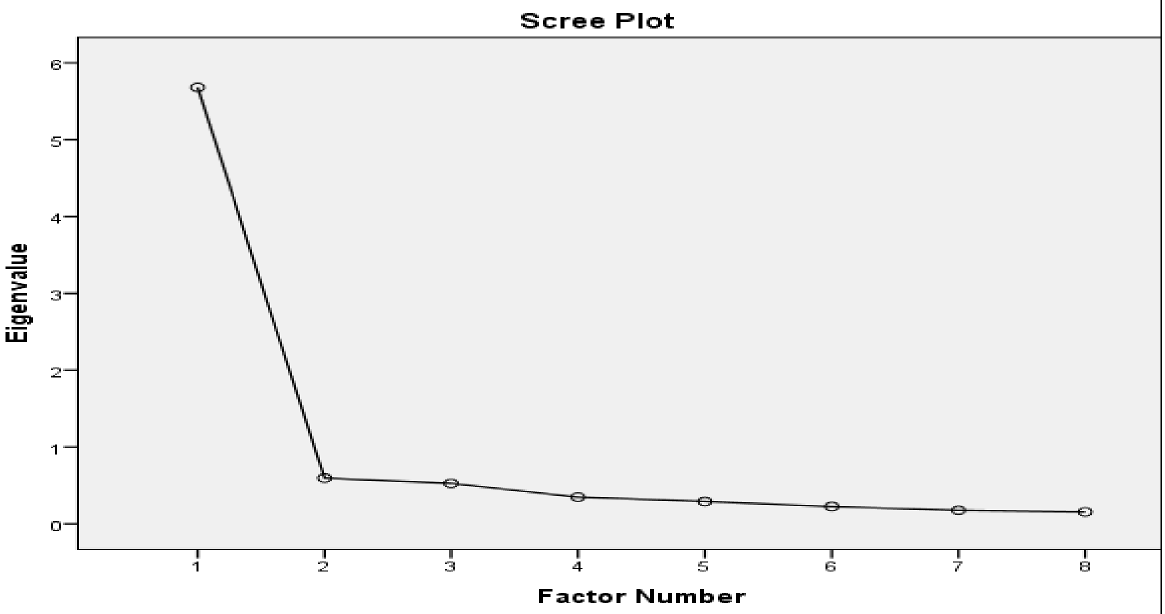


Figure 7.12: Scree plot for risk culture

Pattern Matrix

	Factor		
	1	2	3
RCU6	.972		
RCU1	.813		
RCU4	.515		
RCU7			
RCU2		1.065	
RCU3		.637	
RCU8		.500	
RCU5			1.067

Table 7.33: Pattern matrix for risk culture

The pattern matrix demonstrates that three factors, RCU1, RCU4, and RCU6, load onto the first latent cluster, while another three factors, RCU2, RCU3, RCU8, load onto the second latent cluster. RCU5 loads onto the third factor with a very high loading value of 1.067 and will be shifter to first latent cluster.

Pattern Matrix						
Variable Code	Component		Cronbach Alpha	# of Items	New Code	New Description
	1	2				

RCU6	.972		.880	4	RCUG1	Risk culture development
RCU1	.813					
RCU4	.515					
RCU5	1.067					
RCU2		1.065	.891	3	RCUG2	Risk Culture awareness
RCU3		.637				
RCU8		.500				

Table 7.34: Pattern matrix for risk culture with new codes

In Table 7.34:

- Four items, RUC1, RCU4, RCU5, and RCU6, are moderately reliable for they have Cronbach's alpha of 0.880.
- Three items, RCU2, RCU3, and RCU8, are moderately reliable because they have Cronbach's alpha of 0.891

In summary, four items, RUC1, RCU4, RCU5, and RCU6, were coded into a new variable (RCUG1), while the three items, RCU2, RCU3, and RCU8 were coded into a new variable (RCUG2).

The interpretation of the (2) new latent clusters is provided below:

7.5.6a- Risk culture development – RCUG1

Risk culture development (RCUG1) consists of the first and the third components derived from eight factors of risk culture. The first component comprises three factors, while the third component encompasses one component, which explains 45.58% and 4.37% of the variation in risk culture respectively. Like in organisational culture, shared values, beliefs, principles, attitudes, goals, and practices determine the formation and the development of risk culture in organisations. Risk culture plays a central role in risk management and governance because it shapes processes, procedures, principles, and values in organisations. Risk culture development involves the growth of a culture that supports risk management and governance. The Institute of Risk Management has elucidated risk culture as a product of interrelationship of personal ethics, behaviours, and organisational culture (Chapman 2014). For risk culture to develop, organisations ought to define their principles, guidelines, roles, and regulations employed in the management of risks. To attain commendable risk culture, risk managers must educate employees on the essence of developing risk culture in their organisations.

The scrutiny of items in the questionnaire that predict risk culture shows that several factors contribute to the development of risk culture. The existence of guidelines for promoting accountability in risk management is necessary. By following established guidelines and applying them in risk management continually, risk managers reinforce accountability and create a culture of compliance. The questionnaire also reveals that training of employees and the board of directors is essential for the robust and extensive development of risk culture. Training boosts dissemination of guidelines and creates synergy in the implementation of strategies and interventions deployed in risk management. Ring et al. (2014) observe that lessons derived from regulatory notices enable organisations to strengthen their risk culture and manage risks efficiently. The existence of audit process, empowering programs, and guidelines for fostering risk management are integral to the development of risk culture.

7.5.6b - Risk culture awareness – RCUG2

Risk culture awareness (RCUG2) is the second component derived from eight factors that cover risk culture. It constitutes three factors, which account for 28.71% of the variation in risk culture. Risk culture awareness involves the understanding of roles, regulations, and guidelines that organisations employ in risk management. In the development risk culture, the building of awareness is the first step. Risk managers cannot develop risk culture in their organisations without creating awareness among employees. Organisations create risk culture awareness through communication and training of employees to understand various guidelines and practices of risk management. Effective strategies for building awareness entail the delivery of risk communication, the definition of roles and responsibilities, the performance of risk management, and the review of risk guidelines (Arras 2016). Thus, risk culture awareness forms the basis of the development of risk culture.

The analysis of questionnaire provides significant insights relating to risk culture awareness themes in organisations. The questionnaire notes the existence of awareness program for it aids in the development of risk awareness. Besides, the internal audit system should have guidelines, which stipulate how organisations acquire and develop risk culture. Risk guidelines aids in the creation of uniform interventions and strategies employed in risk management. Evidently, ERM provides a framework through which the management integrates various aspects of risk management such as identification, evaluation, and review of risks. The implementation of ERM improves risk awareness in organisations and boost performance (Frigo 2018). As cases of fraud occur in organisations, employees should be aware of ethical guidelines for effective deterrence and prevention.

7.5.7 FACTOR ANALYSIS FOR RISK APPETITE

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	7.638	84.866	84.866	6.811	75.680	75.680	6.850
2	.392	4.360	89.226	.880	9.783	85.463	6.787
3	.220	2.450	91.676	.229	2.547	88.010	6.268
4	.189	2.095	93.770				
5	.154	1.710	95.480				
6	.130	1.445	96.925				
7	.112	1.249	98.174				
8	.094	1.039	99.213				
9	.071	.787	100.000				

Table 7.35: Total variance explained for risk appetite

Factor analysis extracted three factors with eigenvalues of 6.811, 0.880, and 0.229, which accounted for 75.68%, 9.78%, and 2.55% of the variation in risk appetite in that order. The scree plot below endorses that the three extracted factors have a significant influence on the risk appetite.

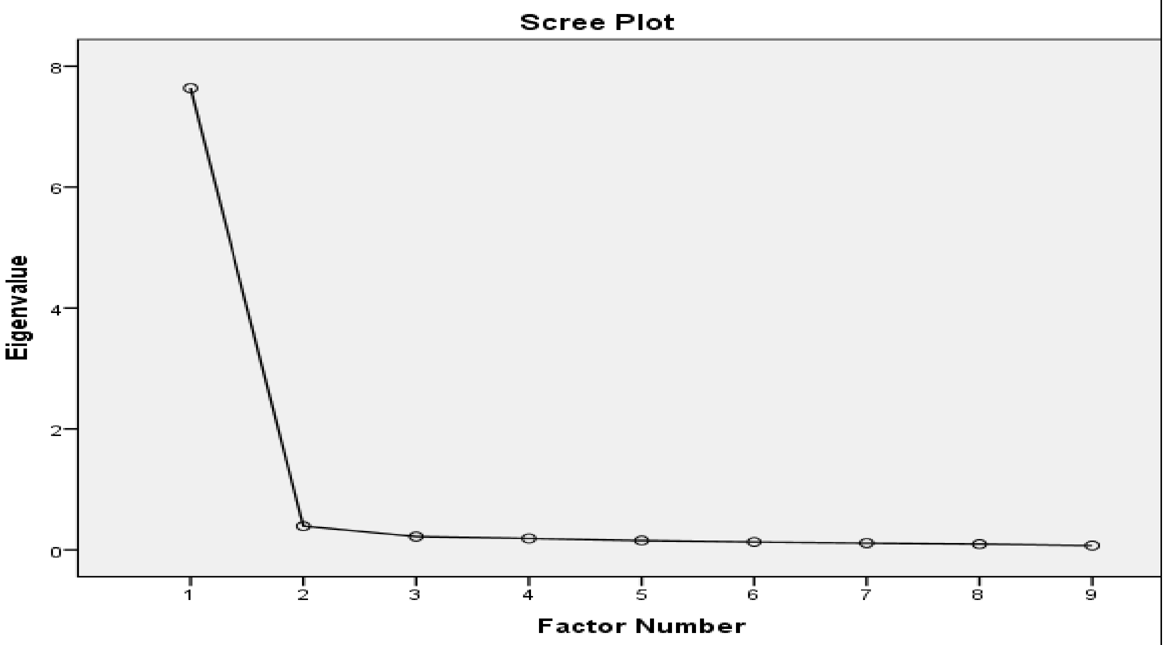


Figure 7.13: Scree plot for risk appetite

The pattern matrix (Table 8.8.2) shows that four items, RA1, RA2, RA4, and RA4, loaded onto the first latent cluster with high loadings. Subsequent four items, RA5, RA6, RA7, and RA9, loaded onto the second latent cluster, whereas RA8 is the only factor that loaded onto the third factor with a significant loading value. Thus, pattern matrix for new code included RA8 into the second latent cluster, as demonstrated in Table 7.36.

Pattern Matrix

	Factor		
	1	2	3
RA1	.911		
RA2	.836		
RA3	.732		
RA4	.508		
RA9		.901	
RA7		.555	
RA5		.551	
RA6		.526	
RA8			.842

Table 7.36: Pattern matrix for risk appetite

Pattern Matrix

Variable Code	Component		Cronbach Alpha	# of Items	New Code	New Description
	1	2				

RA1	.911		.960	4	RAG1	Risk appetite
RA2	.836					
RA3	.732					
RA4	.508					
RA9		.901	.967	5	RAG2	Risk appetite alignment process
RA7		.555				
RA5		.551				
RA6		.526				
RA8		.842				

Table 7.37: Pattern matrix for risk appetite with new codes

In Table 7.37:

- Four items, RA1, RA2, RA3, and RA4, loaded onto the first latent cluster with Cronbach's alpha of 0.960 indicating an excellent reliability.
- Five items, RA5, RA6, RA7, RA8, and RA9, loaded onto the second latent cluster with Cronbach's alpha of 0.967 also showing an excellent reliability.

Overall, the four items, RA1, RA2, RA3, and RA4, loaded onto the first latent cluster and created a new variable (RAG1), whereas the five items, RA5, RA6, RA7, RA8, and RA9, loaded onto the second latent cluster and formed a new variable (RAG2).

The interpretation of the (2) new latent clusters is provided below:

7.5.7a- Risk Appetite – RAG1

Risk appetite (RAG1) is a novel cluster extracted from nine items of risk appetite in risk governance. It is the first component with four factors, which are not only reliable but also explain 75.68% of the variance in risk appetite. Risk appetite is a parameter that measures the capacity of an organisation to tolerate a certain level of risk without experiencing significant impacts on its objectives and goals. Organisations with a high level of risk appetite can overcome considerable impacts of risks, while organisations with low risk appetite cannot tolerate minor risks that they experience (Kaplan & Mikes 2016). Normally, organisations perform risk assessment and determine their ability to bear different forms of risks. Essentially, risk assessment report allows risk managers to design and implement strategies and interventions, which would boost risk appetite, and thus, cushion organisations from the effects of most risks.

The questionnaire supports the existence of risk appetite in risk governance. Risk appetite framework is the foundation of risk assessment because risk managers can utilize it in drafting guidelines and interventions employed in risk management. Moreover, the existence of a defined risk appetite statement aids in the establishment of a robust risk appetite framework, which is critical in the assessment of risk appetite (Baldan, Geretto & Zen 2016). The existence of mechanism of comprehending the degree of risk is necessary in determining risk appetite of an organisation. Due to the dynamic nature of risks, an elaborate review mechanism for periodic assessment appetite limits is necessary. Thus, risk managers need guidelines for risk assessment and review to ascertain risk appetite in organisations.

7.5.7b- Risk appetite alignment process – RAG2

Risk appetite alignment process (RAG2) is the cluster component generated from nine factors of risk appetite. It contains the second and the third components with four factors and one factor respectively. The first component and the second component account for 9.78% and 2.55% of the variances in risk appetite respectively. Risk appetite alignment is a novel approach that modern organisations have developed and perfected in risk management. It entails alignment of risk appetite with risks, strategies, interventions, and activities of risk management. Proper alignment of risk appetite is beneficial to organisations because it promotes the achievement of strategic goals and reduces residual risks. According to risk-based performance, organisations align their risk appetite by defining strategic goals, assessing appetite, identifying risks, reviewing appetite, conducting a risk assessment, aligning appetite with established risks (Nahar, Jubb & Azim 2016). Hence, such a process of risk appetite alignment provides an opportunity for review of risks and reassessment of appetite.

The scrutiny of questionnaire shows important patterns of themes, which describes risk appetite process in risk governance. The questionnaire recognises that risks are dynamic, and thus, it suggests the existence of frequent reassessments of risk appetite to align with the prevailing changes of strategic goals of organisations. For guidelines are drivers of risk management in an organisation, risk alignment should consider optimising the interactions of business activities and the management. An effective interaction creates a favourable environment for risk management and alignment of risk appetites with organizational goals and objectives (Nahar, Jubb & Azim 2016). Constant reporting of the degree of risk appetite enhances the responsive capacity of organizations by alerting and preparing them. The existence of established frameworks such as ERM and risk-based performance aids in the integration risk appetite in performance.

7.5.8 FACTOR ANALYSIS FOR RISK BASED AUDIT AND PROJECT SUCCESS

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	20.258	72.352	72.352	20.017	71.488	71.488	17.401
2	.966	3.451	75.802	.749	2.675	74.164	16.835
3	.811	2.896	78.699	.562	2.007	76.170	16.636
4	.624	2.228	80.927				
5	.575	2.053	82.980				
6	.507	1.809	84.789				
7	.493	1.760	86.549				
8	.433	1.546	88.094				
9	.370	1.323	89.417				
10	.340	1.214	90.631				
11	.290	1.036	91.668				
12	.271	.966	92.634				
13	.253	.905	93.539				
14	.230	.820	94.359				
15	.203	.724	95.083				
16	.199	.710	95.793				
17	.181	.646	96.439				
18	.154	.549	96.988				

19	.141	.505	97.493				
20	.125	.445	97.938				
21	.115	.412	98.350				
22	.104	.373	98.723				
23	.092	.328	99.051				
24	.068	.244	99.295				
25	.065	.233	99.528				
26	.053	.190	99.718				
27	.042	.151	99.870				
28	.037	.130	100.000				

Table 7.38: Total variance explained for risk audit and project success

The extracted factors, 1, 2, and 3, have eigenvalues of 20.017, 0.749, and 0.562, which accounted for 71.49%, 2.68%, and 2.01% of the variation in risk governance correspondingly. The scree plot demonstrates that the three factors extracted accounted for a significant variation in risk governance.

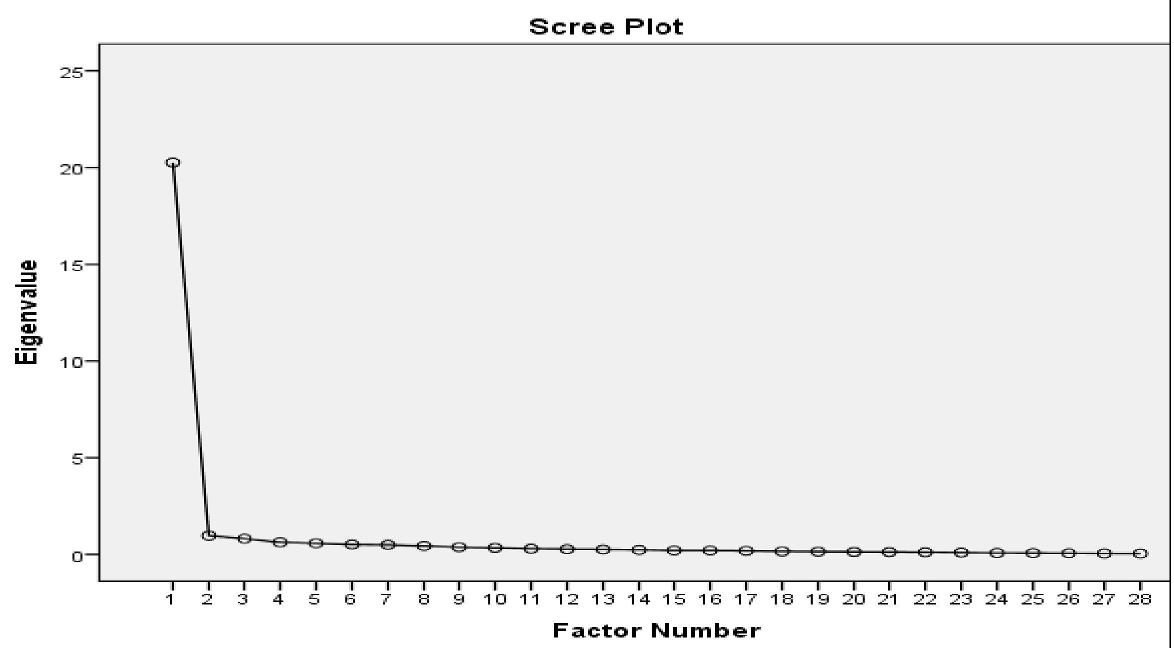


Figure 7.14: Scree plot for risk Audit and project success

Pattern Matrix

	Factor		
	1	2	3
RG10	.816		
RG9	.795		

RG15	.703		
RG8	.674		
RG12	.668		
RG14	.638		
RG13	.603		
RG18	.586		
RG1	.575		
RG16	.543		
RG11	.496		
RG26		.768	
RG25		.739	
RG21		.606	
RG24		.589	
RG20		.506	
RG22		.505	
RG27		.485	
RG7			
RG28			
RG17			
RG4			.866
RG6			.749
RG5			.647
RG23			.630
RG2	.471		.486
RG3			
RG19			

Table 7.39: Pattern matrix for risk Audit and project success

Pattern matrix demonstrates that RG10 has the highest loading value (0.816) while RG2 has the lowest loading value (0.471) in the first latent cluster with 11 items. In the second latent cluster with seven items, RG26 has the highest loading value (0.768), while RG27 has the lowest loading value (0.485). RG4 has the highest loading value of 0.866, whereas RG2 has the lowest loading value of 0.486.

Variable Code	Pattern Matrix						
	Component			Cronbach Alpha	# of Items	New Code	New Description
	1	2	3				
RG10	.816			.969	11	RGP1	Efficient project delivery
RG9	.795						
RG15	.703						
RG8	.674						
RG12	.668						
RG14	.638						
RG13	.603						

RG18	.586						
RG1	.575						
RG16	.543						
RG11	.496						
RG26		.768		.956	7	RGP2	Efficient risk monitoring
RG25		.739					
RG21		.606					
RG24		.589					
RG20		.506					
RG22		.505					
RG27		.485					
RG4			.866	.945	5	RGP3	Effective project risk management
RG6			.749				
RG5			.647				
RG23			.630				
RG2			.486				

Table 7.40: Pattern matrix for risk audit and project success with new codes

In Table 7.40:

- The 11 items, RG1, RG8, RG9, RG10, RG11, RG12, RG13, RG14, RG15, RG16, and RG18, loaded onto the first latent cluster with an excellent level of reliability (Cronbach's alpha = 0.969).
- The seven items, RG20, RG21, RG22, RG24, RG25, RG26, and RG27, loaded on the second latent cluster with an excellent reliability index of 0.956.
- The five items, RG2, RG4, RG5, RG6, and RG23, have a superb reliability level for they have Cronbach's alpha of 0.945.

In summary, the 11 items from the risk governance scale, RG1, RG8, RG9, RG10, RG11, RG12, RG13, RG14, RG15, RG16, and RG18, formed a new latent variable (RGP1). Likewise, the seven items, RG20, RG21, RG22, RG24, RG25, RG26, and RG27, formed a new latent variable (RGP2). The five items, RG2, RG4, RG5, RG6, and RG23, created a new latent variable (RGP3).

The interpretation of the (3) new latent clusters is provided below:

7.5.8a – efficient project delivery – RGP1

Efficient project delivery (RGP1) is a new cluster derived from 28 items of risk governance. It consists of 11 items that are highly reliable for they explain 71.49% of the variation in risk governance. Primarily, risk governance is the core of risk management for it involves institutions, policies, rules, regulations, practices, processes, and procedures that management utilizes in making strategic decisions aimed at improving organizational performance and alleviating risks. Moreover, it constitutes frameworks, models, and systems that stipulate mechanism and define boundaries of organizational operations and activities. Viscelli, Beasley, and Hermanson (2016) place the responsibility of risk governance on the board for it can create, fund, and implement interventions of risks management. Risk governance enables organizations to assess risks, determine risk appetites, and align strategic operations to guarantee performance.

The conceptualization of risk governance in relation to the successfulness of projects offers critical insights necessary for effective management of risks. The achievement of strategic objectives is an outstanding aspect of risk governance because risk managers focus on attaining expectations of projects. In their study, Stein and Wiedemann (2016) assert that risk governance acts as a bridge that links risk management and corporate governance to optimize outcomes. Evidently, risk governance is valuable to organizations because it boosts the efficiency of operations, prevents the occurrence of crises, saves costs in the delivery of projects, and streamlines processes.

7.5.8b– Efficient risk monitoring – RGP2

This cluster is derived from 7 items of risk-based audit processes, that is, RG20, RG21, RG22, RG24, RG25, RG26, and RG27, and it is consistent with the literature on continuous risk monitoring in which it is regarded as critical in addressing and auditing project risks. It explains 2.68 % of the variance in risk-based audit and project success by factor analysis. Risk monitoring is the real-time assessment of an enterprise's risk status using a set of key risk indicators to prioritize audit procedures.

Studies consider continuous risk monitoring a core element of a dynamic auditing process. For example, Bumgarner and Vasarhelyi (2014) consider it a systematic approach to risk evaluation and audit planning that supports the detection of shifts in an organization's risk profile for effective governance. They further highlight the significance of risk monitoring; it enables auditors to populate risk assessments and auditing with new data to support risk management. Given the changing nature of risks, auditors have to continually evaluate and monitor risks to relate them to risk auditing and management. From the questionnaire, risk monitoring captures different aspects and outcomes of a well-designed risk-based auditing process. The adoption of risk monitoring using KRIs would help uncover emerging risks in a real-time manner. In a study, Moon (2016) supports the principles of accountability, adequate identification of risk appetites, prudent financial resource utilization, better management of stakeholder expectations, and improved strategic plan execution at board level. A risk-based auditor evaluates and identifies areas of potential risk impacts through relevant KRIs to ensure timely mitigation. Thus, periodic audit processes may not be consistent with the principles of the risk-based auditing. It should be recursive and based on continuous risk monitoring to respond to changes in an entity's risk status throughout a business cycle.

7.5.8c – Effective project risk management – RGP3

This cluster was formed from five items RG2, RG4, RG5, RG6, and RG23, which predict the success of projects. Effective project risk management accounts for 2.01% of the explained variance through factor analysis. This research corroborates the findings of related studies on the influence of risk-based audit processes on project success. It is understood from the literature that risk-based auditing connects the internal audit function to the firm's risk governance strategy, assuring the management that project risk management is aligned to the defined risk appetite (Moon 2016). Risk-based auditing assures the board – an organ bearing the ultimate responsibility for risk identification and management – that the risks are being managed effectively.

The specific components of effective risk management in projects, as identified in the questionnaire, include timely and on-budget delivery, board-level reporting of consolidated and key risks, and risk identification and sharing across departments. Raydugin (2016) holds that project management allows managers to "identify, assess, and control" key risks at corporate and project level, which tend to be similar across departments (p. 295). For this reason, organisations adopt integrated risk management frameworks, such as ERM, to strengthen their risk culture – identification, assessment, and management capabilities. Multiple reporting of project risks to the chief financial officer who sits at the board can help avoid the management of risks in silos and enhance the involvement of project managers in the planning and execution of risk management activities to mitigate risks and capitalize on opportunities (Raydugin 2016). At this point, the firm should utilise internal auditing to add value to the portfolio of project risk management. Thus, from the literature, effective project risk management supports strategic decisions through consolidated risk identification, reporting, and sharing across departments, and informed resource allocation.

7.5.9FACTOR ANALYSIS FOR OCCURRENCE OF NEGATIVE EVENTS

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	5.915	59.149	59.149	4.252	42.520	42.520	4.926
2	1.370	13.704	72.853	1.830	18.297	60.817	4.079
3	.673	6.732	79.585	1.068	10.683	71.500	4.112
4	.593	5.925	85.510				
5	.346	3.462	88.972				
6	.300	3.005	91.977				

7	.258	2.584	94.561				
8	.215	2.150	96.711				
9	.179	1.786	98.497				
10	.150	1.503	100.000				

Table 7.41: Total variance explained for occurrence of negative events

The extracted factors, 1, 2, and 3, have eigenvalues of 4.252, 1.830, and 1.068, which account for 42.52%, 18.30%, and 10.68% of the variation in impacts of negative events. However, the scree plot indicates that five factors significantly influence impacts of negative events on projects.

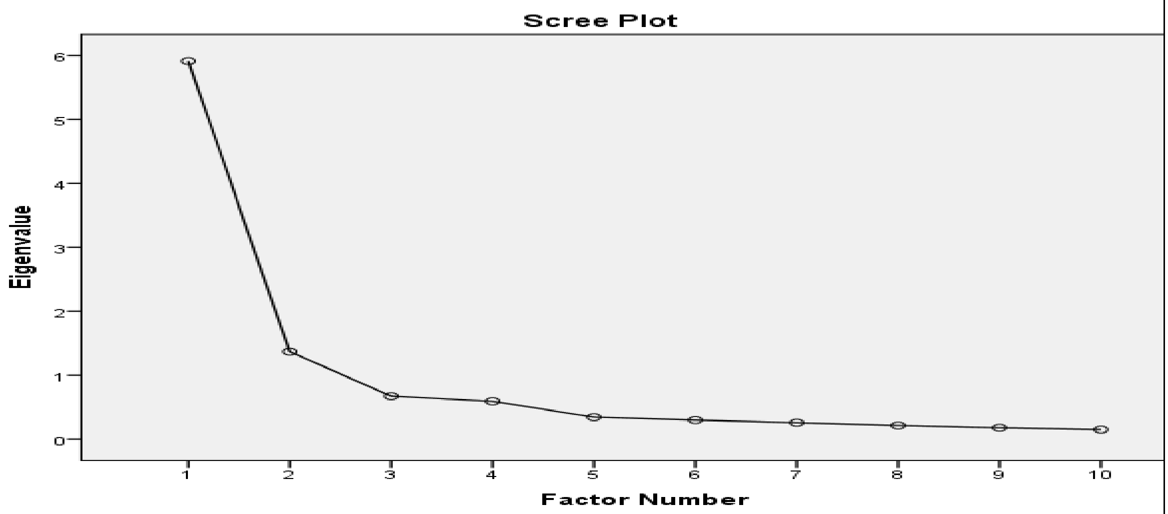


Figure 7.15: Scree plot for occurrence of negative events

Pattern Matrix

	Factor		
	1	2	3
IN3	.920		
IN7	.898		
IN5	.777		
IN9	.697		
IN2		1.004	
IN1		.820	
IN6		.600	
IN4		.522	
IN8			.973
IN10			.492

Table 7.42: Pattern matrix for occurrence of negative events

The pattern matrix shows that four items, IN3, IN5, IN7, and IN9, loaded onto the first latent cluster, whereas another four items, IN1, IN2, IN4, and IN6, loaded onto the second latent cluster. Two items, IN8 and IN10, loaded onto the third latent cluster with loadings of 0.973 and 0.492 respectively.

Pattern Matrix						
Variable Code	Component		Cronbach Alpha	# of Items	New Code	New Description
	1	2				
IN3	.920		.919	5	INP1	Governance Failure
IN7	.898					
IN5	.777					
IN9	.697					
IN8	.973					
IN2		1.004	.861	5	INP2	Project failure
IN1		.820				
IN6		.600				
IN4		.522				
IN10		.973				

Table 7.43: Pattern matrix for impacts of negative events for new codes

In Table 7.43:

- Latent cluster 1 has five items, IN3, IN5, IN7, IN8, and IN9, with an excellent reliability because the Cronbach's alpha is 0.919.
- Latent cluster 2 has five items, IN1, IN2, IN4, IN6, and IN10, with a high reliability index of 0.861.

In summary, factor analysis created two new latent variables from 10 items on impacts of negative events. The five items, IN3, IN5, IN7, IN8, and IN9, formed INP1 as a new latent variable, while the remaining five items, IN1, IN2, IN4, IN6, and IN10, created INP2 as a new latent variable.

The interpretation of the (2) new latent clusters is provided below:

7.5.9a – Governance Failure – INP1

Governance failure is a new cluster derived from five questionnaire items, that is, IN3, IN5, IN7, IN8, and IN9, associated with negative project impact. This cluster explains 42.52%

of the variance determined through factor analysis. This finding is supported by the literature, where it is established that risk management failures result in the omission of opportunities and inability to meet strategic objectives (Fadun 2013). Since risk permeates all organisations and departments, integrated risk management can enhance the predictability of risks and enable them to take advantage of opportunities. However, in most firms, traditional models of risk governance that categorises and manages risks as separate entities are common, increasing the likelihood of governance failure. The major downside of this model is its narrow focus on organisational risks, as opposed to a holistic view of uncertainties and possible opportunities.

Risk governance failure could stem from various pitfalls as reflected in the questionnaire. Precisely, deficient control over project phases, deficient governance model, the absence of independent monitoring and board-level reporting, and inability to meet strategic objectives are linked to unsuccessful risk management. Fedun (2013) extends this list further by identifying three reasons why risk governance systems fail. First, agency risk, which describes the inadvertent or obstinate neglect of risk mitigation procedures of the firm by staff, can contribute to failure. Second, the dynamic nature of systematic risks related to the economic forces makes them inevitable in a business context. Thirdly, flaws in risk management processes may lead accumulate over time and cause governance failure. In this view, there is need to perform a regular review of an organisation's risk management framework to recognise and address possible deficiencies on time.

7.5.9b– Project failure – INP2

Project failure is the second new cluster created from five items (IN1, IN2, IN4, IN6, and IN10). It captures the adverse events occurring in organisations that impact negatively on projects. This cluster accounts for 18.30% of the variance in the occurrence of negative events. Project implementation often comes with the pressure to stay on budget and deliver within the expected timelines. From the questionnaire, delays in schedules, cost overrun, project failure history, unresolved disputes, and opportunity costs related to implementing wrong projects are the key factors contributing to failed projects. As Cagliano, Grimaldi, and Rafele (2015) note, the movement between project phases comes with a certain level of uncertainty. Therefore, the risk management approach should be flexible to accommodate unique threats inherent in each stage. In addition, the techniques selected must support corporate maturity towards the various threats that evolve during the project lifecycle.

Errors committed by the project manager or teams also contribute to project failure. Fedun (2013) states that individual or corporate "risk attitude, risk culture, and risk appetite" influence staff perception of risks and opportunities (p. 233). The management's position on acceptable risks would depend on the organisation's perception of threats. Thus, a poor risk attitude could adversely affect project objectives. In addition, the way people perceive or interpret risk determines how they will manage potential project risks. In essence, the factors identified in the questionnaire – schedule delays, cost overruns, failure history, etc. – reflect the risk culture of the organisation. The prevalent attitudes and values about threats would determine how managers and staff perceive and respond to risks. Additionally, the risk appetite would depend on how risk-taking behaviour is rewarded in the organization (Fedun 2013). Thus, project failure can be avoided by inculcating the right risk attitudes, culture, and appetite.

7.5.10 FACTOR ANALYSIS FOR INTERNAL AUDIT FUNCTION

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	4.801	43.642	43.642	3.301	30.005	30.005	4.111
2	3.078	27.978	71.620	3.065	27.861	57.866	3.345
3	.891	8.102	79.723	1.623	14.758	72.624	3.093
4	.628	5.713	85.436				
5	.427	3.880	89.315				
6	.306	2.780	92.096				

7	.271	2.463	94.558				
8	.225	2.046	96.604				
9	.168	1.526	98.130				
10	.122	1.113	99.243				
11	.083	.757	100.000				

Table 7.44: Total variance explained for the internal audit function

The extracted factors, 1, 2, and 3, have eigenvalues of 3.301, 3.065, and 1.623, which explained 30.00%, 57.87%, and 14.76% of the variation in the internal audit function. The scree plot indicates that five items in the scale are significant in explaining the variation in the internal audit function.

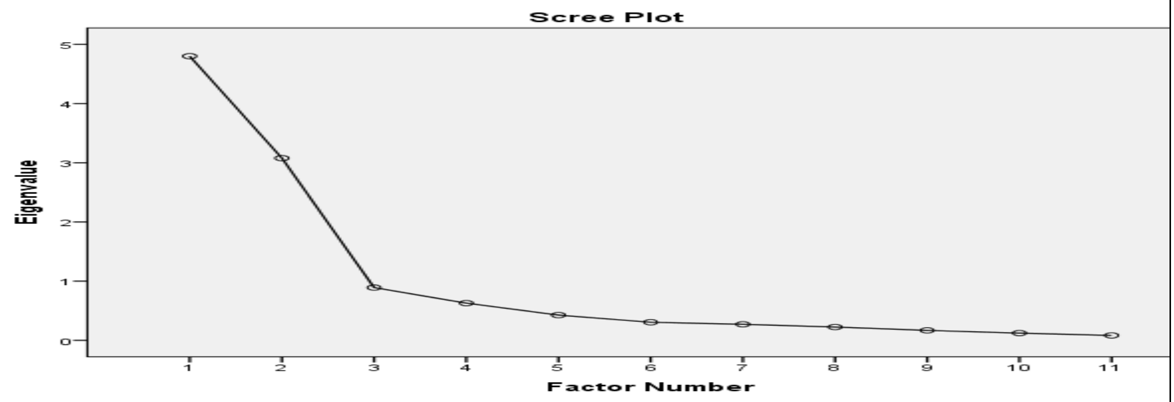


Figure 7.16: Scree plot for the internal audit function

Pattern Matrix

	Factor		
	1	2	3
IAF2	.966		
IAF4	.856		
IAF1	.793		
IAF3	.684		
IAF5			
IAF9		.964	
IAF11		.886	
IAF8		.866	
IAF10		.839	
IAF7			.954
IAF6			.551

Table 7.45: Pattern matrix for the internal audit function

The pattern matrix illustrates that four items, IAF1, IAF2, IAF3, and IAF4, loaded onto the first latent cluster with the highest eigenvalue being 0.966. Another four items, IAF5, IAF8, IAF10, and IAF11, loaded onto the second latent cluster with the highest eigenvalue being 0.964. Two factors, IAF7 and IAF6, loaded onto the third latent cluster with eigenvalues of 0.954 and 0.551 respectively.

	Pattern Matrix						
Variable Code	Component			Cronbach Alpha	# of Items	New Code	New Description
	1	2	3				
IAF2	.966			.901	4	IAFR1	Role of Internal Audit
IAF4	.856						
IAF1	.793						
IAF3	.684						
IAF9		.964		.935	4	IAFR2	Auditing of risk governance function
IAF11		.886					
IAF8		.866					
IAF10		.839					
IAF7			.954	.905	2	IAFR3	Provision of audit reports
IAF6			.551				

Table 7.46: Pattern matrix for the internal audit function with new codes

In Table 7.46:

- Four items, IAF1, IAF2, IAF3, and IAF4, loaded onto the first latent cluster with have a superb reliability for they have Cronbach's alpha of 0.901.
- Four items, IAF8, IAF9, IAF10, and IAF11, loaded onto the second latent cluster with an excellent reliability index of 0.935.
- Two items, IAF7 and IAF6, loaded onto the third latent cluster with an excellent reliability index of 0.905.

In recap, factor analysis created three new latent variables, IAFR1, UAFR2, and IAFR3, from 11 items in the scale. The four items, IAF1, IAF2, IAF3, and IAF4, formed IAFR1 as a new latent code, whereas other four items, IAF8, IAF9, IAF10, and IAF11, created IAFR2 as a new latent code. The two variables, IAF6 and IAF7, created IAFR3 as a new latent code.

The interpretation of the (3) new latent clusters is as follows. Based on the indexes of Cronbach alpha, 11 items in the scale were synthesized into three distinctive clusters. Each of them was given a new latent code as well as new description. Thus, IAFR1 refers to the role of the internal audit, IAFR2 refers to the auditing of risk governance function, and IAFR3 includes variables related to the provision of audit reports. As new latent clusters, they have a considerably reliable Cronbach alpha, which was calculated on the bases of the items included in the cluster. As the vast majority of variables had significantly high indexes of Cronbach alpha alone, it is apparent that the cumulative reliability of these variable is also high.

The creation of these new clusters has significant implications for the research. As the result of factor analysis of the internal audit function, it allows to give a proper structure in term of further analysis. With the variable being categorized into three distinctive clusters, it is possible to refer to them as being a part of a particular aspect of internal audit process. Further, it is essential to focus on each cluster in particular.

7.5.10a – Role of Internal Audit – IAFR1

This new cluster is derived from four items, that is, IAF1, IAF2, IAF3, and IAF4, of the internal audit function. It constitutes a fundamental aggregate component predicting the significance of auditing in risk management in organizations. The role of internal audit accounts for 30.01% of the variance as determined through factor analysis. In most firms, board directions on risk management are delivered via the audit committee – the unit around which all audit activities coalesce. Ravindran et al. (2015) outline three functions of internal auditing in risk management: assurance, consultative, and facilitative roles. This activity entails a systematic assessment and response to risk control issues to strengthen the risk governance process. It incorporates accounting controls that support financial reporting and accountability (Ravindran et al. 2015).

The roles investigated through the questionnaire are consistent with the tasks of the internal auditing identified in the literature. The main purpose of this department is to give objective assurance to the board regarding the efficiency of the risk governance process, that is, risks are well managed, and internal controls are working (Florea & Florea 2016). Internal auditing can also act as a catalyst for the creation of a formal risk management program. The internal auditor, given his/her knowledge of risks, can champion for enhanced ERM capabilities in the firm. Thus, he/she can give advice and consultancy services that can bolster the company's risk management and control procedures (Florea & Florea 2016). However, resource availability and the level of risk maturity in the enterprise may limit the consulting role. Another critical obligation of internal auditors is facilitation. This role entails giving technical expertise, project coordination, and providing documentation controls to facilitate risk management.

7.5.10b– Auditing of Risk Governance Function – IAFR2

This second cluster is created from five items, namely, IAF8, IAF9, IAF10, and IAF11. Auditing of the risk governance function can reliably predict audit functions involved in the management of risks in organizations. This cluster explains 27.86% of the variance obtained through factor analysis. The internal auditing function is primarily an assurance provider. Its independence and objectivity are ensured when it is not involved in the risk management process (Ravindran et al. 2015). However, from a business point of view, this unit may be integrated into formal risk management. Internal auditors may review the organisation's risk appetite, provide assurance on the development of the risk management policy and strategy, and review the implementation of risk responses on behalf of the management. Therefore, linking internal auditing to risk management may create additional value for the organisation if there are adequate safeguards in place to preserve the objectivity of this function.

The auditing of risk governance activities requires collaborative practices to realize greater value for the firm. It entails tying audit plans to ERM to facilitate information sharing and avoid role duplication (Ravindran et al. 2015). Thus, the internal auditor, risk committee, and the team involved in the management of strategic risks and controls should collaborate in auditing the risk management framework. As Moon (2016) observes, in the current business environment, internal auditing primarily provides assurance that strengthens corporate governance. This function not only augments accounting management, but also assures the ERM process and supports the assessment of enterprise operations (Moon 2016). Therefore, internal auditing is a powerful tool for strengthening an organization's control environment and aligning audit objectives with risk management goals.

7.5.10c– Provision of Audit Reports – IAFR3

This cluster is formed from two items assessing the internal audit function's role in overseeing risk management, which include IAF6 and IAF7. This cluster accounts for 14.76% of the explained variance in this factor. The findings of this research are consistent with those of other studies on this subject. Audit reports give information about risks for which assurance and consultancy were given through the auditing of the risk governance procedures and responses (Benli & Celayir 2014). Reporting also gives details of the effects of resource constraints and the uncovered risks. The questionnaire focused on the assurance function of auditing, such as audit reports on the management of key risks and entity-wide risk management process. Reporting is required to reinforce the board's ownership of risk governance. Audit findings help elicit a discussion on how management can assume responsibility for all threats included in the risk register (Pritchard 2015). Therefore, internal auditors would need to develop and deliver regular reports to the audit committee during a project lifecycle.

The findings may influence the conclusions on ERM efficacy and capacity to meet the organization's strategic objectives. The report should provide an opinion on the effectiveness of the current risk management process in the context of the firm's strategic objectives. Ruse, Susmanschi, and Daneci-Patrau (2014) write that a continuous risk monitoring and assessment (CRMA) approach to auditing that allows internal auditors to report to the audit committee and the management on enterprise-wide risks to allow the prioritization of risk responses. In addition, significant business risks are identified in audit reports to support board decisions and remedial actions. The CRMA approach allows the management to understand and respond to the firm's dynamic risks and determine the efficacy of the Risk Management controls.

7.6 Analysis of Variance

Analysis of variance (ANOVA) is a statistical method that evaluates the potential differences among a group of means (Urdan 2017). The dependent variable is often at the scale-level, whereas the independent variable is at the nominal-level and may have two or more categories. The purpose of this section is to present the findings of ANOVA testing about whether there is a relationship between respondents' views on various management issues based on job levels.

ANOVA entails comparing means, there is a need to formulate null and alternative hypotheses. The standard null hypothesis for an ANOVA test is that there is no significant difference among groups (Curtis et al. 2015). The alternative hypothesis, conversely, assumes that at least one significant difference exists among the groups.

After formulating the hypotheses, the researcher should test the assumptions of ANOVA. The next step entails computing the *F*-ratio and the related probability value, which is referred to as the *p*-value. The null hypothesis is rejected if the *p*-value linked to the *F* is smaller than the established level of significance, which could be 0.05 or 0.01. Rejecting the null hypothesis implies that the alternative hypothesis is supported and that the means of all the groups are unequal. Subsequently, the researcher needs to conduct post hoc tests to identify the groups that differ from each other. Post hoc tests are *t*-tests that analyse mean differences between groups. Several post hoc tests exist, including Dunnet, Scheffe, Bonferroni, and Tukey tests (Kucuk et al. 2016). These tests reduce the chances of type I errors, which is the erroneous rejection of the null hypothesis (Kucuk et al. 2016).

Two main factors are used to determine whether ANOVA is suitable for analysis. The first factor is the level of measurement of the variables. The dependent variable must be a continuous level of measurement, which could be interval or ratio. On the other hand, the independent variables must be categorical, which could be nominal or ordinal. Since ANOVA is a parametric test, it is guided by three assumptions and has some assumptions. The first assumption is that the data are normally distributed. The second assumption of ANOVA is that the variances are homogeneous. This assumption implies that the variance between the groups should be more or less equal. The third assumption of ANOVA is that the observations are independent of each other. Various tests can be used to test these assumptions. For example, Levene's test or the Brown-Forsythe Test can be used to test the assumption of homogeneity of variance. Similarly, the normality of the distribution can be tested using skewness and kurtosis, histograms, and tests such as the Kolmogorov-Smirnov or Shapiro-Wilk (Roberts & Russo 2014). The study design is useful in determining the assumption of independence. Nevertheless, researchers should be cautious and keep an eye open for irrelevant or confounding variables.

The main strength of ANOVA as a method of data analysis is that it is a robust procedure regarding contraventions of the assumption of normality. Literature published in the 1950s and earlier stated that the *F*-tests used in ANOVA were not robust following contraventions of the assumption that the populations of the variables follow a normal distribution, especially for unbalanced scenarios and small alpha (α) levels (Field & Wilcox

2017). It was also believed that violating the assumption of equal variances led to drastic type I errors. However, studies conducted by Donaldson in the 1960s revealed that the *F*-test was conservative despite small divergences from the assumptions of equal variance and normality, which did not affect the overall significance substantially (Field & Wilcox 2017). Additionally, these effects reduce with an increase in the sample size. This realization has increased the popularity of ANOVA as a statistical method of analysis.

7.6.1 Research Hypotheses

Based on the principles and assumptions of ANOVA as explained in the above sub-section, the researcher formulated the hypotheses indicated in Table 7.47 The hypotheses were grouped based on the four main factors being investigated. The details of each analysis are explained in the following sections.

Table 7.47 Table of research hypotheses

Restatement of Research Hypotheses		
	1- Analysis of Variance of perception of the Determinants of Risk Governance Framework	
1	$H_0 1: \beta 1 = 0.$	There is no statistically significant difference between the respondents' in rating "Determinants of Risk Governance Framework Factors based on their position to"
	$H_A 1: \beta 1 \neq 0.$	There is a statistically significant difference between the respondents' views on "Determinants of Risk Governance Framework Factors based on their position"
	2- Analysis of Variation of perception of Risk-based Audit and the Success of Projects	

2	H_0 11: $\beta 11 = 0$.	There is no statistically significant difference between the respondents' in rating “Risk-based Audit and the Success of Projects based on their position”.
	H_A11: $\beta 11 \neq 0$.	There is a statistically significant difference between the respondents' in rating “Risk-based Audit and the Success of Projects based on their position”.
3- Analysis of Variance of perception of the occurrence of Negative Events of Projects Factors		
3	H_0 12: $\beta 12 = 0$.	There is no statistically significant difference between the respondents' views on “occurrence of Negative Events of Projects Factors based on their position”.
	H_A 12: $\beta 12 \neq 0$.	There is a statistically significant difference between the respondents' views on “occurrence of Negative Events of Projects Factors based on their position”.
4- Analysis of Variance of perception of Internal Audit Function in Overseeing Risk Management		
4	H_0 13: $\beta 13 = 0$.	There is no statistically significant difference between the respondents' views on “Internal Audit function in Overseeing Risk Management based on their position”.
	H_A 13: $\beta 13 \neq 0$.	There is a statistically significant difference between the respondents' views on “Internal Audit Function in Overseeing Risk Management based on their position”.

7.6.2 Analysis of Variance of Determinants of Risk Governance Framework

Analysis using ANOVA was performed to determine if there were any significant differences between the respondent's perceptions of determinants of risk governance framework factors. A total of 10 factors were tested, including “Strategy”, “Risk Appraisal and Insight”, “Risk Decision and Process Implementation”, “Risk Management and Governance”, “Review Risk Development and Decision”, “Risk Communication”, “Risk Culture”, “Financial and Technical Capacity”, “Risk Appetite”, and “Risk Ownership” between 3 groups based on their job levels (employee, middle management, and top management).. An ANOVA analysis was conducted to justify the statistical differences of the groups’ responses in each category. The hypothesis test was computed using SPSS software at a significance level of 0.05. The F-statistic and the p-values were observed.

It is of high importance to observe the results obtained from the analysis of variance of the determinants of risk governance. In general, the results of the analysis for each particular factor are considerably similar for some determinants, and thus they could be synthesized into one summary paragraph so that there was no need for the repetition. The analysis included six factors that should be discussed here: strategy audit process, risk appraisal and insight audit process, risk decision and process implementation audit, risk management and governance audit process, review risk development and decision audit process, as well as risk communication audit process. For each of the mentioned factor, respondents were asked to respond to a distinct number of items, which varied from factor to factor, in order to indicate the likelihood of the existence of these factors in their organization.

The results were collected, and then the Table 1 in Appendix B were developed. For each of the mentioned factors, the results indicated under the column ‘Sig.’ show p-values greater than 0.05 for the factors tested. Accordingly, it could be stated with certainty that there were no significant differences in how the respondents perceive the mentioned factors and their existence in their organizations. As the result, the H_0 hypothesis, which assumes that there is no statistically significant difference between the respondents’ rating of the determinant of risk governance, was not rejected due to no enough evidence for the causes of variation related to each of the mentioned factors. Further tests for determining specific means between the respondents were not needed.

For other two factors included in the determinants of risk governance framework, namely financial and technical capacity audit process and risk appetite audit process, the results were considerably similar to the one that were discussed above. P-values for both factors were greater than 0.05, which means that there were no considerable differences in between the respondents' perception of these factors. Accordingly, the null hypothesis was not rejected due to no enough evidence for the causes of variation related to these factors as well.

In terms of analysis of variance of Risk Culture Audit Process Respondents were asked to respond to 8 items by indicating the likelihood of the existence of those factors in their organization. As shown in Table 7.48, 2 out of 8 factors tested showed significant differences between respondents’ perceptions of risk culture Audit process variation based on job levels. Thus, the null hypothesis was refuted. To find out the statistical difference between the views of respondents about factor RCU5 “existence of a process for risk culture audit”, the results in Table 7.48 showed that F = 3.636 with a p-value = 0.030. With regard to factor RCU8 “existence of formal training of fraud risk awareness and ethical culture”, the result in Table 9.2 showed that F = 3.338 with p = 0.040, which was lower than the previous factor. The findings on the remaining 6 factors that were insignificant are included in Table 7 of Appendix B.

Table 7.48. ANOVA test for risk culture audit process variation factors related to the job level

		Sum of Squares	df	Mean Square	F	Sig.
RCU5	Between Groups	12.384	2	6.192	3.636	.030
	Within Groups	189.055	111	1.703		
	Total	201.439	113			
RCU8	Between Groups	9.727	2	4.864	3.308	.040
	Within Groups	163.194	111	1.470		
	Total	172.921	113			

Additional examination of the Tukey HSD post hoc multiple comparison tests with regard to factor RCU5 showed that there was a significant difference in the views of employees and top management (p = 0.023) regarding the existence of a process for risk culture audit in the organization (Table 7.49). Similarly, the Tukey HSD test showed that there was a significant difference in the views of employees and top management (p = 0.034) regarding the existence of formal training of fraud risk awareness and ethical culture.

Table 7.49. Post hoc test for factor RCU5 and RCU8

Dependent Variable	(I) Job_Level	(J) Job_Level	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
RCU5	Employee	Middle Management	.437	.294	.301	-.26	1.14
		Top Management	.806*	.300	.023	.09	1.52
	Middle Management	Employee	-.437	.294	.301	-1.14	.26
		Top Management	.369	.306	.451	-.36	1.10
		Employee	-.806*	.300	.023	-1.52	-.09

	Top Management	Middle Management	-.369	.306	.451	-1.10	.36
RCU8	Employee	Middle Management	.443	.273	.241	-.21	1.09
		Top Management	.705*	.279	.034	.04	1.37
	Middle Management	Employee	-.443	.273	.241	-1.09	.21
		Top Management	.262	.284	.628	-.41	.94
	Top Management	Employee	-.705*	.279	.034	-1.37	-.04
		Middle Management	-.262	.284	.628	-.94	.41
*. The mean difference is significant at the 0.05 level.							

On the other hand Respondents were asked to respond to 7 items of Risk Ownership Audit Process by indicating the likelihood of the existence of those factors in their organization. An ANOVA test was performed to determine if there were any significant differences between the respondent's perceptions of ownership factors related to the job level. Table 7.50 indicated that there was a significant difference between respondents' perceptions of 1 out of the 7 ownership factors. The difference was significant on factor O7 "existence of a third-party professional service provider for risk management activities" (F = 4.008, p = 0.021). There was no significant difference in the views of respondents on the other 6 factors as indicated in Table 10 of Appendix B. Thus, there was a need to conduct additional tests on this factor to identify where the differences existed in factor O7.

Table 7.50 ANOVA test for Risk Ownership Audit process factors related to job level

		Sum of Squares	df	Mean Square	F	Sig.
O7	Between Groups	13.221	2	6.611	4.008	.021

Within Groups	183.068	111	1.649			
Total	196.289	113				

Additional examination of the Tukey HSD post hoc multiple comparison tests with regard to factor O7 showed that there was a significant difference in the views of employees and top management ($p = 0.015$) regarding the likelihood of the existence of a third-party professional service provider for risk management activities in the organization (Table 7.51).

Table 7.51. Post hoc test for factor O7

Dependent Variable	(I) Job Level	(J) Job Level	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
O7	Employee	Middle Management	.345	.289	.459	-.34	1.03
		Top Management	.836*	.296	.015	.13	1.54
	Middle Management	Employee	-.345	.289	.459	-1.03	.34
		Top Management	.490	.301	.238	-.22	1.20
	Top Management	Employee	-.836*	.296	.015	-1.54	-.13
		Middle Management	-.490	.301	.238	-1.20	.22

*. The mean difference is significant at the 0.05 level.

Based on the findings of the analysis, only 3 out of the 93 determinants of "Risk Governance Audit Framework" factors related to job level issues were significant. Therefore, the null hypothesis was rejected, leading to the conclusion that there is at least one statistically significant difference between the respondents' views on determinants of risk governance Audit framework factors related to job level issues. Significant differences existed in one ownership factor (O7 "existence of third-party professional service provider for risk management activities”) and two risk culture factors. However, the contribution of these factors was minimal.

7.6.3 Analysis of Variance of Risk-Based Audit and the Success of Projects Factors

An ANOVA test was performed to determine if there were any significant differences between the respondent's perceptions of risk-based audit and the success of projects related to job level. Variation related to risk-based audit and the success of projects was examined where the 11th hypothesis was tested (11. H_0 11: β11 = 0 or ≠ 0). The hypothesis test was done at a significance level of 0.05. The F-statistic and the p-values were observed.

A total of 28 factors was examined based on 3 job levels (employee, middle management, and top management). Out of these, only 5 were significant: RG1 “the achievement of strategy objectives”, RG2 “delivering projects on time and budget”, RG8 “fewer surprises and crisis in projects”, RG9 “more focus on efficiency of project phases”, and RG14 “better organizational readiness”. Table 9.6 indicated that there was a significant difference between respondents’ perceptions of RG1 based on job levels even though the difference was not highly significant (F = 3.115, p = 0.048). There was a significant difference between respondents’ perceptions of RG2 based on job levels (F = 4.465, p = 0.014). The respondents’ perceptions of RG8, and RG9 were statistically significant at (F = 3.600, p = 0.031) and (F = 3.455, p = 0.035) respectively. Similarly, there was a significant difference between the respondents’ perceptions of RG14 based on job levels even though the difference was not highly significant (F = 3.090, p = 0.049). There was no significant difference in 23 out of 28 factors as indicated in Table 11 in Appendix B.

Table 7.52. ANOVA test for risk-based audit and the success of projects factors related to job level

		Sum of Squares	df	Mean Square	F	Sig.
RG1	Between Groups	5.659	2	2.829	3.115	.048
	Within Groups	100.833	111	.908		
	Total	106.491	113			
RG2	Between Groups	7.382	2	3.691	4.465	.014
	Within Groups	91.750	111	.827		
	Total	99.132	113			
RG8	Between Groups	6.627	2	3.313	3.600	.031
	Within Groups	102.154	111	.920		
	Total	108.781	113			
RG9	Between Groups	6.093	2	3.046	3.455	.035
	Within Groups	97.872	111	.882		
	Total	103.965	113			
RG14	Between Groups	5.149	2	2.574	3.090	.049
	Within Groups	92.474	111	.833		
	Total	97.623	113			

The statistically significant findings in Table 7.52 necessitated the performance of post hoc tests to determine the specific groups where significant differences in perceptions occurred. Therefore, Tukey's HSD post hoc tests were conducted about factors RG1, RG2, RG8, RG9, and RG14. The findings are summarized in Table 7.53 where the findings of the column labelled Sig. were used to identify the differences. P-values <0.05 were useful in identifying the significant differences. It was noted that:

- For RG1 “the achievement of strategy objectives”, there was a significant difference in the views of employees and middle management regarding the likelihood of risk-based audit contributing in achievement of strategy objectives by helping the organization achieve its goals. However, this difference was not highly significant ($p = 0.047$). Despite the low significance, this finding indicated that the attainment of objectives influences, though its usefulness may be low compared to other risk-based audit processes.
- For RG2 “delivering projects on time and budget”, there was a significant difference in the views of employees and middle management ($p = 0.013$) regarding the likelihood of the impact of risk-based audit on delivering projects on time and budget by contributing to helping the organization achieve its goals. This difference could be attributed to the fact that employees report directly to middle-level management and the two parties are likely to engage in discussions concerning the meeting of deadlines to deliver timely projects.
- For RG8 “fewer surprises and crisis in projects”, significant differences in opinions regarding the likelihood of the risk-based audit lead to fewer surprises and crisis in projects contributing to the attainment of project objectives were observed between employees and middle management ($p = 0.023$).
- For RG9 “more focus on efficiency of project phases”, there was no significant difference on the respondents’ regarding the likelihood of increased focus on the efficiency of projects’ phases on realizing organizational objectives between the 3 job levels.
- For RG14 “better organizational readiness”, there was a significant difference in the views of employees and middle management ($p = 0.013$) regarding the likelihood of

Risk based audit enhanced organizational readiness by helping an organization achieve its project objectives.

For the other 23 factors, there was no need to conduct post hoc tests because the factors were not significant. Overall, the ANOVA result for “risk-based audit and the success of projects factors” based on job levels indicated that there were statistically significant differences between the respondents' perceptions of 5 out of 28 factors tested. Therefore, the null hypothesis was rejected.

Table 7.53. Post hoc test for factors RG1, RG2, RG8, RG9, and RG14

Dependent Variable	(I) Job Level	(J) Job Level	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
RG1	Employee	Middle Management	-.516*	.215	.047	-1.03	-.01
		Top Management	-.378	.219	.202	-.90	.14
	Middle Management	Employee	.516*	.215	.047	.01	1.03
		Top Management	.138	.223	.810	-.39	.67
	Top Management	Employee	.378	.219	.202	-.14	.90
		Middle Management	-.138	.223	.810	-.67	.39
RG2	Employee	Middle Management	-.591*	.205	.013	-1.08	-.10
		Top Management	-.426	.209	.108	-.92	.07
	Middle Management	Employee	.591*	.205	.013	.10	1.08
		Top Management	.165	.213	.720	-.34	.67
		Employee	.426	.209	.108	-.07	.92

	Top Management	Middle Management	-.165	.213	.720	-.67	.34
RG8	Employee	Middle Management	-.580*	.216	.023	-1.09	-.07
		Top Management	-.287	.221	.398	-.81	.24
	Middle Management	Employee	.580*	.216	.023	.07	1.09
		Top Management	.292	.225	.397	-.24	.83
	Top Management	Employee	.287	.221	.398	-.24	.81
		Middle Management	-.292	.225	.397	-.83	.24
RG9	Employee	Middle Management	-.501	.211	.051	-1.00	.00
		Top Management	-.459	.216	.090	-.97	.05
	Middle Management	Employee	.501	.211	.051	.00	1.00
		Top Management	.042	.220	.980	-.48	.56
	Top Management	Employee	.459	.216	.090	-.05	.97
		Middle Management	-.042	.220	.980	-.56	.48
RG14	Employee	Middle Management	-.499*	.206	.044	-.99	-.01
		Top Management	-.340	.210	.242	-.84	.16
	Middle Management	Employee	.499*	.206	.044	.01	.99
		Top Management	.159	.214	.739	-.35	.67
	Top Management	Employee	.340	.210	.242	-.16	.84
		Middle Management	-.159	.214	.739	-.67	.35

*. The mean difference is significant at the 0.05 level.

7.6.4 Analysis of Variance of the occurrence of Negative Events of Projects factor

An ANOVA test was conducted to determine if there were any significant differences between the respondent's perceptions of the occurrence of negative events of projects related to the job level. A total of 10 factors was considered based on 3 job levels (employee, middle management, and top management). Causes of variation related to the occurrence of negative events of projects factors were examined where the 12th hypothesis was tested (12. H_0 12: $\beta 12 = 0$ or $\neq 0$). The hypothesis test was done at a significance level of 0.05. The F-statistic and the p-values were observed. Respondents were asked to rate the occurrence of 10 negative events of projects in the organization. These events included “experiencing schedule delays”, “cost overrun”, “lack of control over the projects phases”, “past project failures”, “the failure of governance model to manage key projects”, “the existence of unresolved issues and disputes”, “a lack of independent monitoring of progress”, “a lack of reporting to board and executives”, “failure to achieve the business objectives”, and “a loss of opportunity cost of doing the wrong projects”.

Table 12 in Appendix B indicated that there was no significant difference between respondents’ perceptions of the 10 factors tested based on job levels. The opinions of respondents on the impact of negative events of projects did not differ significantly, which implied that all employees agreed regarding the incidence of specific negative events in the organization. This agreement is a good indicator because it implies that all members of the organization are informed about the ongoing at their workplace with regard to the incidence of negative project activities. There was no need for additional post hoc analyses since the results were insignificant. Therefore, there was sufficient evidence to reject the null hypothesis and conclude that there is no statistically significant difference between the respondents' views on the occurrence of negative events of projects factors related to job level issues.

7.6.5 Analysis of Variance of Internal Audit Function in Overseeing Risk Management

An ANOVA test was conducted to determine if there were any significant differences between the respondent's perceptions of internal audit function in overseeing risk management related to job level. Causes of variation related to internal audit function in overseeing risk management were examined where the 13^{th} hypothesis was tested (13. H_0 13: $\beta 13 = 0$ or $\neq 0$). The hypothesis test was done at a significance level of 0.05. The F-statistic and the p-values were observed. Respondents were asked to rate the importance of various audit factors in the management of organisation risk by choosing one out of five options. A total of 11 factors was tested out of which the opinions of the respondents on 6 factors were significant based on 3 job levels (employee, middle management, and top management). These factors were IAF1 “Providing independent assurance on risk management processes”, IAF6 “Providing assurance through written reports covering how key risks are managed”, IAF8 “review the organization’s risk appetite”, IAF9 “Provide assurance on Developed the organizational policies for its risk management processes”, IAF10 “provide assurance of risk management strategy for board approval”, and IAF11 “revision the Implementation risk responses on management’s behalf”.

Table 9.8 indicated that there was a significant difference between respondents’ perceptions of IAF1 based on job levels ($F = 3.934$, $p = 0.022$). There was a significant difference between respondents’ perceptions of IAF6 based on job levels ($F = 4.274$, $p = 0.016$). These differences could be attributed to differences in work experience, educational level, or age. Respondents’ perceptions of IAF8, IAF9, IAF10, and IAF11 were statistically significant at (F = 3.394, p = 0.037), (F = 3.753, p = 0.026), (F = 4.516, p = 0.013), and (F = 5.087, p = 0.008) respectively.

Table 7.54 ANOVA for audit function in overseeing risk management

		Sum of Squares	df	Mean Square	F	Sig.
IAF1	Between Groups	6.598	2	3.299	3.934	.022
	Within Groups	93.086	111	.839		
	Total	99.684	113			
IAF6	Between Groups	5.740	2	2.870	4.274	.016
	Within Groups	74.541	111	.672		
	Total	80.281	113			
IAF8	Between Groups	11.441	2	5.720	3.394	.037
	Within Groups	187.059	111	1.685		
	Total	198.500	113			
IAF9	Between Groups	12.656	2	6.328	3.753	.026
	Within Groups	187.134	111	1.686		
	Total	199.789	113			
IAF10	Between Groups	13.493	2	6.747	4.516	.013
	Within Groups	165.840	111	1.494		
	Total	179.333	113			
IAF11	Between Groups	16.958	2	8.479	5.087	.008
	Within Groups	185.006	111	1.667		
	Total	201.965	113			

Having rejected the null hypothesis, it was necessary to determine where the differences were observed using Tukey's HSD post hoc tests with regard to Factors IAF1, IAF6, IAF8, IAF9, IAF10, and IAF11. In Table 7.55, it was noted that:

- For IAF1 "Providing independent assurance on risk management processes", there were differences in the respondents' opinions regarding the importance of providing independent assurance on risk management processes for risk management between top management and middle management ($p = 0.020$).
- For IAF6 "Providing assurance through written reports covering how key risks are managed", there were significant differences ($p = 0.012$) between the perceptions of top management and employees regarding the importance of providing assurance through written reports covering how key risks are managed on risk management.
- For IAF8 "review the organization's risk appetite", there was a significant difference between the perceptions of middle management and top management regarding the importance of revision of the organization's risk appetite ($p = 0.045$). Nevertheless, this difference was not highly significant. However, it indicated that participation in revision an organization's risk appetite was a useful audit function in risk management.
- For IAF9 "Provide assurance on Developing the organizational policies for its risk management processes", there was a significant difference in the perceptions of middle and top management regarding the value of developing the organizational policies for its risk management processes by audit functions ($p = 0.030$).
- For IAF10 "provide assurance on risk management strategy for board approval", there was a significant difference between the perceptions of top management and employees on the importance of developing risk management strategy for board approval as an audit function ($p = 0.011$).

- For IAF11 "review the Implementation of risk responses on management's behalf", there was a significant difference between the perceptions of top management and employees on the importance of revision the implementing risk responses on management's behalf as an audit function (p = 0.016). A significant difference based on this factor was also noted between middle and top management (p = 0.019). This observation indicated that diverse opinions existed regarding the importance of review the implementing risk responses in an organization by Internal Audit. Therefore, there was a need to conduct additional investigations regarding this factor.

Table 7.55 Post hoc test – factor IAF1, IAF6, IAF8, IAF9, IAF10, and IAF11

Dependent Variable	(I) Job Level	(J) Job Level	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
IAF1	Employee	Middle Management	.160	.206	.719	-.33	.65
		Top Management	-.424	.211	.114	-.93	.08
	Middle Management	Employee	-.160	.206	.719	-.65	.33
		Top Management	-.584*	.215	.020	-1.09	-.07
	Top Management	Employee	.424	.211	.114	-.08	.93
		Middle Management	.584*	.215	.020	.07	1.09
IAF6	Employee	Middle Management	-.227	.185	.437	-.67	.21
		Top Management	-.551*	.189	.012	-1.00	-.10
	Middle Management	Employee	.227	.185	.437	-.21	.67
		Top Management	-.323	.192	.216	-.78	.13

	Top Management	Employee	.551*	.189	.012	.10	1.00
		Middle Management	.323	.192	.216	-.13	.78
IAF8	Employee	Middle Management	-.105	.292	.932	-.80	.59
		Top Management	.630	.299	.093	-.08	1.34
	Middle Management	Employee	.105	.292	.932	-.59	.80
		Top Management	.735*	.304	.045	.01	1.46
	Top Management	Employee	-.630	.299	.093	-1.34	.08
		Middle Management	-.735*	.304	.045	-1.46	-.01
IAF9	Employee	Middle Management	-.137	.292	.887	-.83	.56
		Top Management	.646	.299	.082	-.06	1.36
	Middle Management	Employee	.137	.292	.887	-.56	.83
		Top Management	.783*	.304	.030	.06	1.51
	Top Management	Employee	-.646	.299	.082	-1.36	.06
		Middle Management	-.783*	.304	.030	-1.51	-.06
IAF10	Employee	Middle Management	.237	.275	.666	-.42	.89
		Top Management	.829*	.281	.011	.16	1.50
	Middle Management	Employee	-.237	.275	.666	-.89	.42
		Top Management	.592	.286	.102	-.09	1.27
	Top Management	Employee	-.829*	.281	.011	-1.50	-.16
		Middle Management	-.592	.286	.102	-1.27	.09

IAF11	Employee	Middle Management	.004	.291	1.000	-.69	.70
		Top Management	.838*	.297	.016	.13	1.54
	Middle Management	Employee	-.004	.291	1.000	-.70	.69
		Top Management	.834*	.302	.019	.12	1.55
	Top Management	Employee	-.838*	.297	.016	-1.54	-.13
		Middle Management	-.834*	.302	.019	-1.55	-.12
*. The mean difference is significant at the 0.05 level.							

The insignificant factors are indicated in Table 13 of Appendix B. Since there were significant differences in respondents' perceptions in 6 out of the 11 factors examined, there was sufficient evidence to reject the null hypothesis and conclude that there is a statistically significant difference between the respondents' views on audit function in overseeing risk management.

As it was apparent from this section's discussion, the results of the analysis of the respondents' perceptions of the audit function were considerably different from the results of the perception analysis of the determinants of risk governance. The interpretation of the results from this section allows categorizing the aforementioned differences in two groups. The first group refers to differences in the perception of particular aspects of the audit function between top management and middle management. For this group, there are three variables: providing independent assurance on risk management processes, reviewing the organization's risk appetite, and providing assurance on developing the organizational policies for its risk management processes.

The second group of variables refers to differences in the perception of the audit function between top management and employees. The group includes the following variables:

providing assurance on risk management strategy for board approval, providing assurance through written reports that cover the management of principal risks, and reviewing the implementation of risk responses on the management's behalf. These results could indicate that there were significant differences between the perception of the internal audit function, which might be due to the fact that some of the companies' employees as well as members of top and middle management groups do not always have a concise understanding of the audit function.

7.7 Correlation Analysis

Correlation analysis is a statistical assessment technique employed when studying the strength of an association between two continuous variables (Pollock 2015). Correlation analysis determines possible links between variables. However, it does not identify the cause-effect aspect of the connection because it does not consider other variables may have affected the outcomes (Gelman et al. 2014). The correlation between two variables implies that a change in one variable leads to a systematic change in the other over time. A positive correlation occurs if the value of one variable increases as the value of the second rises. Conversely, negative correlation happens when the value of one variable decreases as the value of the second increases.

Correlation coefficients, which range from +1 to -1, are used to quantify the strength of the association (Johnson 2017). Coefficient values that are close to +1 indicate strong positive associations, whereas those close to -1 indicate negative relations. A correlation coefficient of 0 indicates that no association exists between variables. The purpose of this chapter is to examine the strength of the relationship between risk governance determinants and the effectiveness of public projects.

Ten determinants were investigated in the research each of which contained 2 to 3 clusters based on factor analysis. Spearman's correlation was performed for all the variables at two levels of significance (0.01 and 0.05). The findings of the analyses are reported in the following sections.

7.7.1 Association between the new latent cluster and the project success

7.7.1.1 *Association between new latent of Strategy (S) and Project Success (RG)*

There are two latent clusters for strategy construct: SG1 and SG2. Table 7.56 shows the correlation values for these relationships. The largest positive correlation at 0.01 significance level is 0.537 with a significance of 0.0. This correlation is between SG1 "risk alignment process" of strategy cluster and RG4 "issuance of consolidated reports of disparate risk at board level" of RG. The lowest positive correlation at 0.01 significance level is 0.254. This correlation is between SG2 of strategy cluster and RG11 of RG. SG2 is "risk oversight practices", whereas RG11 is "capability to take on critical risks in order to get greater reward".

Table 7.56. Association between strategy (S) and project success (RG)

		Strategy	
		SG1	SG2
Project Success	RG1	.500**	.417**
	RG2	.496**	.371**
	RG3	.497**	.323**
	RG4	.537**	.374**
	RG5	.504**	.356**
	RG6	.473**	.305**
	RG7	.487**	.359**
	RG8	.474**	.317**
	RG9	.451**	.293**
	RG10	.425**	.290**
	RG11	.455**	.254**
	RG12	.447**	.365**
	RG13	.442**	.300**
	RG14	.429**	.329**
	RG15	.481**	.384**

	RG16	.491**	.359**
	RG17	.527**	.414**
	RG18	.361**	.331**
	RG19	.487**	.376**
	RG20	.480**	.394**
	RG21	.427**	.353**
	RG22	.495**	.426**
	RG23	.523**	.337**
	RG24	.454**	.369**
	RG25	.465**	.392**
	RG26	.397**	.315**
	RG27	.476**	.313**
	RG28	.505**	.399**

7.7.1.2 *Association between new latent of Risk Appraisal and Insight (RAI) and Project Success (RG)*

There are two latent clusters for "risk appraisal and insight" (RAI) construct: RAIG1 and RAIG2. Table 7.57 shows the correlation values for these relationships. The largest positive correlation at 0.01 significance level is 0.605. This correlation is between RAIG1 "risk guidelines" of RAI cluster and RG17 "early identification and understanding of internal and external issues pertaining to projects" of RG. The lowest positive correlation at 0.01 significance level is 0.264. This correlation is between RAIG2 "risk assessment process" and RG11 "capability to take on critical risks in order to get greater reward".

Table 7.57. Association between risk appraisal and insight (RAI) and project success

		Risk Appraisal and Insight	
		RAIG1	RAIG2
Project Success	RG1	.562**	.445**
	RG2	.563**	.447**
	RG3	.571**	.375**
	RG4	.581**	.440**

	RG5	.520**	.396**
	RG6	.475**	.356**
	RG7	.504**	.399**
	RG8	.513**	.340**
	RG9	.495**	.343**
	RG10	.477**	.332**
	RG11	.445**	.264**
	RG12	.493**	.344**
	RG13	.474**	.389**
	RG14	.489**	.394**
	RG15	.520**	.383**
	RG16	.536**	.436**
	RG17	.605**	.447**
	RG18	.488**	.380**
	RG19	.538**	.412**
	RG20	.585**	.442**
	RG21	.525**	.414**
	RG22	.558**	.424**
	RG23	.573**	.444**
	RG24	.537**	.412**
	RG25	.563**	.413**
	RG26	.457**	.379**
	RG27	.494**	.334**
	RG28	.504**	.402**

7.7.1.3 *Association between new latent of Risk Management and Governance (RMGG) and Project Success (RG)*

There are two latent clusters for "risk management and governance" (RMGG) construct: RMGG1 and RMGG2. Table 7.58 shows the correlation values for these relationships. The largest positive correlation at 0.01 significance level is 0.657. This correlation is between RMGG1 "risk governance" and RG20 "adoption of risk-based audit has enabled optimal utilization of financial resources" of RG. The lowest positive correlation at 0.01 significance level is 0.350. This correlation is between RMGG2 "risk control" of RMGG cluster and RG26 "risk-based audit helps to identify the risk appetite adequately" of RG.

Table 7.58. Association between risk management and governance (RMGG) and project success

		Risk Management and Governance	
		RMGG1	RMGG2
Project Success	RG1	.579**	.471**
	RG2	.548**	.412**
	RG3	.606**	.474**
	RG4	.615**	.491**
	RG5	.596**	.450**
	RG6	.548**	.447**
	RG7	.576**	.425**
	RG8	.518**	.431**
	RG9	.538**	.445**
	RG10	.521**	.430**
	RG11	.479**	.410**
	RG12	.565**	.465**
	RG13	.561**	.433**
	RG14	.517**	.404**
	RG15	.577**	.475**
	RG16	.598**	.469**
	RG17	.610**	.453**
	RG18	.524**	.362**
	RG19	.569**	.433**
	RG20	.657**	.518**
	RG21	.543**	.390**
	RG22	.596**	.452**
	RG23	.620**	.501**
	RG24	.597**	.451**

	RG25	.617**	.476**
	RG26	.496**	.350**
	RG27	.531**	.395**
	RG28	.534**	.417**

7.7.1.4 *Association between new latent of Review Risk Development and Decision (RRD) and Project Success (RG)*

There are three latent clusters for "review risk development and decision" (RRD) construct: RDG1, RDG2, and RDG3. There are 84 possible correlations as indicated in Table 7.59 The largest positive correlation at 0.01 significance level is 0.571. This correlation is between RDG2 "effectiveness assurance" of RRD cluster and RG20 "adoption of risk-based audit has enabled optimal utilization of financial resources" of RG. The lowest positive correlation at 0.01 significance level is 0.294. This correlation is between RDG1 "monitoring guidelines" of RRD cluster and RG26 "risk-based audit helps to identify the risk appetite adequately" of RG.

Table 7.59. Association between review risk development and decision and project success

		Review Risk Development and Decision		
		RDG1	RDG2	RDG3
Project Success	RG1	.393**	.515**	.483**
	RG2	.414**	.426**	.425**
	RG3	.445**	.510**	.488**
	RG4	.419**	.490**	.471**
	RG5	.463**	.470**	.474**
	RG6	.435**	.447**	.418**
	RG7	.388**	.473**	.454**
	RG8	.417**	.427**	.445**
	RG9	.399**	.414**	.421**
	RG10	.324**	.458**	.444**
	RG11	.362**	.379**	.360**

	RG12	.349**	.454**	.440**
	RG13	.384**	.480**	.434**
	RG14	.370**	.407**	.428**
	RG15	.376**	.482**	.466**
	RG16	.386**	.517**	.467**
	RG17	.448**	.502**	.503**
	RG18	.353**	.455**	.459**
	RG19	.386**	.476**	.461**
	RG20	.405**	.571**	.507**
	RG21	.420**	.524**	.428**
	RG22	.468**	.513**	.472**
	RG23	.494**	.534**	.515**
	RG24	.392**	.493**	.457**
	RG25	.423**	.534**	.516**
	RG26	.294**	.418**	.379**
	RG27	.389**	.445**	.417**
	RG28	.366**	.473**	.436**

7.7.1.5 ***Association between Risk Communication (RC) and Project Success (RG)***

There are three latent clusters for "risk communication" (RCG) construct: RCG1, RCG2, and RCG3. The 84 possible correlations are possible as indicated in Table 7.60. The largest positive correlation at 0.01 significance level is 0.580 with significance of 0.0. This correlation is between RCG2 "risk documentation" of RCG cluster and RG25 "ability to identify the emerging risks associated with strategic plans" of RG. The lowest positive correlation at 0.01 significance level is 0.350. This correlation is between RCG1 "risk communication" of RCG cluster and RG21 "risk-based audit has increased the accountability" of RG.

Table 7.60. Association between risk communication (RCG) and project success

	Risk Communication		
	RCG1	RCG2	RCG3

Project Success	RG1	.444**	.496**	.451**
	RG2	.430**	.515**	.512**
	RG3	.454**	.538**	.546**
	RG4	.401**	.573**	.561**
	RG5	.445**	.548**	.541**
	RG6	.462**	.456**	.564**
	RG7	.404**	.528**	.438**
	RG8	.384**	.476**	.497**
	RG9	.416**	.477**	.488**
	RG10	.370**	.513**	.438**
	RG11	.389**	.414**	.493**
	RG12	.415**	.508**	.453**
	RG13	.370**	.507**	.496**
	RG14	.365**	.480**	.464**
	RG15	.433**	.541**	.481**
	RG16	.441**	.558**	.514**
	RG17	.449**	.571**	.537**
	RG18	.370**	.533**	.429**
	RG19	.398**	.525**	.512**
	RG20	.425**	.564**	.469**
	RG21	.350**	.539**	.430**
	RG22	.486**	.563**	.533**
	RG23	.424**	.574**	.559**
	RG24	.411**	.513**	.511**
	RG25	.505**	.580**	.535**
	RG26	.332**	.456**	.390**
	RG27	.374**	.448**	.480**
	RG28	.320**	.498**	.422**

7.7.1.6 *Association between new latent of Risk Culture (RCU) and Project Success (RG)*

There are two latent clusters for "risk culture" (RCU) construct: RCUG1 and RCUG2. Table 7.61 shows the correlation values for the 56 possible relationships. The largest positive correlation at 0.01 significance level is 0.445. This correlation is between RCUG2 “risk culture awareness” of RCU cluster and RG25 “ability to identify the emerging risks associated with strategic plans” of RG. The lowest positive correlation at 0.01 significance level is 0.242. This correlation is between RCUG1 “risk culture development” of RCU cluster and RG18 “increased likely of delivering projects on scope, on time, and on budget”.

Table 7.61. Association between risk culture (RCU) and project success

		RCUG1	RCUG2
Project Success	RG1	.332**	.444**
	RG2	.328**	.363**
	RG3	.413**	.433**
	RG4	.340**	.316**
	RG5	.352**	.397**
	RG6	.404**	.386**
	RG7	.327**	.402**
	RG8	.281**	.338**
	RG9	.319**	.364**
	RG10	.284**	.346**
	RG11	.357**	.355**
	RG12	.276**	.378**
	RG13	.266**	.349**
	RG14	.307**	.334**
	RG15	.311**	.413**
	RG16	.340**	.411**
	RG17	.355**	.360**
	RG18	.242**	.272**
	RG19	.355**	.338**
	RG20	.313**	.378**
	RG21	.257**	.285**
	RG22	.418**	.439**
	RG23	.341**	.358**
	RG24	.318**	.374**

	RG25	.395**	.445**
	RG26	.270**	.320**
	RG27	.350**	.402**
	RG28	.296**	.366**

7.7.1.7 *Association between new latent of Risk Appetite (RA) and Project Success (RG)*

The "risk appetite" (RA) construct has two latent clusters: RAG1 and RAG2. Table 7.62 shows the 56 possible correlation values for these relationships. The largest positive correlation at 0.01 significance level is 0.608. This correlation is between RAG1 "risk appetite" of RAG cluster and RG3 "improvement of understanding of key risks and their wider implications" of RG. The lowest positive correlation at 0.01 significance level is 0.379. This correlation is between RAG2 "risk appetite alignment process" of RAG cluster and RG28 "fewer operational surprises".

Table 7.62. Association between risk appetite and project success

		Risk Appetite	
		RAG1	RAG2
Project Success	RG1	.531**	.452**
	RG2	.490**	.411**
	RG3	.608**	.518**
	RG4	.549**	.534**
	RG5	.568**	.499**
	RG6	.563**	.507**
	RG7	.551**	.511**
	RG8	.511**	.467**
	RG9	.506**	.431**
	RG10	.495**	.436**
	RG11	.474**	.459**
	RG12	.528**	.475**
	RG13	.567**	.450**
	RG14	.506**	.483**

	RG15	.518**	.460**
	RG16	.507**	.459**
	RG17	.581**	.520**
	RG18	.458**	.407**
	RG19	.505**	.468**
	RG20	.558**	.493**
	RG21	.456**	.440**
	RG22	.531**	.510**
	RG23	.556**	.523**
	RG24	.571**	.513**
	RG25	.594**	.570**
	RG26	.540**	.535**
	RG27	.467**	.484**
	RG28	.431**	.379**

7.7.2 *Association between new latent of Risk based audit Project success (RGP) and Project Success (RG)*

The "project success" (RGP) construct has three latent clusters: RGP1, RGP2, and RGP3. Table 7.63 shows the correlation values for these relationships. The largest positive correlation at 0.01 significance level is 0.929. This correlation is between RGP3 "effective project risk management" of RG cluster and RG4 "issuance of consolidated reports of disparate risk at board level" of RG. The lowest positive correlation at 0.01 significance level is 0.665. This correlation is between RGP1 "efficient project delivery" of RGP cluster and RG26 "risk-based audit helps to identify the risk appetite adequately" of RG.

Table 7.63. Association between Risk based audit project success and project success

		Project Success		
		RGP1	RGP2	RGP3
Project Success	RG1	.812**	.745**	.700**
	RG2	.796**	.752**	.840**
	RG3	.797**	.805**	.866**

	RG4	$.787^{**}$	$.824^{**}$	$.929^{**}$
	RG5	$.793^{**}$	$.813^{**}$	$.907^{**}$
	RG6	$.792^{**}$	$.773^{**}$	$.922^{**}$
	RG7	$.802^{**}$	$.826^{**}$	$.817^{**}$
	RG8	$.903^{**}$	$.760^{**}$	$.831^{**}$
	RG9	$.890^{**}$	$.761^{**}$	$.818^{**}$
	RG10	$.847^{**}$	$.747^{**}$	$.735^{**}$
	RG11	$.839^{**}$	$.739^{**}$	$.794^{**}$
	RG12	$.881^{**}$	$.762^{**}$	$.737^{**}$
	RG13	$.869^{**}$	$.758^{**}$	$.768^{**}$
	RG14	$.878^{**}$	$.757^{**}$	$.820^{**}$
	RG15	$.862^{**}$	$.805^{**}$	$.732^{**}$
	RG16	$.878^{**}$	$.793^{**}$	$.774^{**}$
	RG17	$.811^{**}$	$.824^{**}$	$.804^{**}$
	RG18	$.808^{**}$	$.774^{**}$	$.703^{**}$
	RG19	$.820^{**}$	$.766^{**}$	$.772^{**}$
	RG20	$.800^{**}$	$.843^{**}$	$.727^{**}$
	RG21	$.687^{**}$	$.868^{**}$	$.747^{**}$
	RG22	$.813^{**}$	$.904^{**}$	$.823^{**}$
	RG23	$.825^{**}$	$.840^{**}$	$.912^{**}$
	RG24	$.810^{**}$	$.907^{**}$	$.850^{**}$
	RG25	$.815^{**}$	$.915^{**}$	$.809^{**}$
	RG26	$.665^{**}$	$.820^{**}$	$.670^{**}$
	RG27	$.785^{**}$	$.870^{**}$	$.819^{**}$
	RG28	$.737^{**}$	$.747^{**}$	$.666^{**}$

7.7.3 *Association between the new latent of Occurrence of Negative Events of Projects and Project Success (RG)*

The two latent clusters for “occurrence of negative events of projects” (IN) construct are INP1 and INP2. Table 7.64 shows the correlation values for these relationships. The largest positive correlation at 0.01 significance level is 0.246. This correlation is between INP2 “project failure” of IN cluster and RG1 “the achievement of strategy objectives” of RG. The lowest positive correlation at 0.05 significance level is 0.185. This correlation is between INP2 “project failure” of IN cluster and RG15 “increased project control to maximize efficiency” of RG. The highest negative correlation is -0.196, which is between INP1 “governance failure” cluster of IN and RG18 “increased likely of delivering projects on scope, on time, and on budget” of RG. The lowest negative correlation is -0.184, which is between INP1 cluster of IN and RG17 “early identification and understanding of internal and external issues pertaining to projects”.

Table 7.64. Association between the occurrence of negative events of projects and project success

		Occurrence of Negative Events of Projects	
		INP1	INP2
Project Success	RG1		.246**
	RG2		
	RG3		.190*
	RG4		.187*
	RG5		
	RG6		
	RG7		
	RG8		
	RG9		.193*
	RG10		
	RG11		.191*
	RG12		
	RG13		.210*
	RG14		.231*
	RG15		.185*
	RG16		
	RG17	-.184*	
	RG18	-.196*	

	RG19		
	RG20		
	RG21		.223*
	RG22		
	RG23		
	RG24		.196*
	RG25		
	RG26		.211*
	RG27		
	RG28		.205*

7.7.4 *Association between Internal Audit Function (IAF) and Project Success*

The three latent clusters for "internal audit function" (IAF) construct are IAFR1, IAFR2, and IAFR3. Table 7.65 shows the 84 possible correlation values for these relationships. The largest positive correlation at 0.01 significance level is 0.588. This correlation is between IAFR1 "role of internal audit" of IAF cluster and RG13 "reassurance of adequate implementation of risk management processes" of RG. The lowest positive correlation at 0.01 significance level is 0.186 with significance of 0.0. This correlation is between IAFR2 "auditing of risk governance function" of IAF cluster and RG2 "delivering projects on time and budget" of RG.

Table 7.65. Association between internal audit function (IAF) and project success

		Internal Audit Function		
		IAFR1	IAFR2	IAFR3
Project Success	RG1	.517**		.461**
	RG2	.524**	.186*	.399**
	RG3	.559**	.236*	.409**
	RG4	.523**		.431**
	RG5	.511**	.202*	.485**
	RG6	.449**		.410**
	RG7	.524**		.462**

	RG8	.501**		.433**
	RG9	.512**		.439**
	RG10	.450**		.367**
	RG11	.459**		.443**
	RG12	.517**		.414**
	RG13	.588**		.469**
	RG14	.531**		.447**
	RG15	.510**		.419**
	RG16	.525**		.477**
	RG17	.469**		.456**
	RG18	.498**	.191*	.435**
	RG19	.478**		.407**
	RG20	.546**		.468**
	RG21	.521**		.486**
	RG22	.532**	.201*	.503**
	RG23	.521**		.492**
	RG24	.548**		.476**
	RG25	.530**	.208*	.477**
	RG26	.461**		.399**
	RG27	.504**	.192*	.518**
	RG28	.501**		.447**

7.7.5 Association between new latent cluster and the occurrence of negative events of projects

7.7.5.1 *Association between Strategy (S) and the Occurrence of Negative Events of Projects (IN)*

Table 7.66 shows the correlation values for the relationship between the two latent clusters of "strategy" and IN. The largest negative correlation at 0.01 significance level is -0.261. This correlation is between SG1 "risk alignment process" of strategy and IN8 "lack of reporting to board and executives" of IN. The smallest negative correlation at 0.01 level of significance is -0.188. This correlation is between SG1 “risk alignment process” and IN9 “our organization is experiencing failure to achieve the business objectives”.

Table 7.66. Association between strategy (S) and the occurrence of negative events of projects (IN)

	SG1	SG2
IN1		
IN2		
IN3		
IN4		
IN5		
IN6		
IN7		
IN8	-.261**	
IN9	-.188*	

7.7.5.2 ***Association between Risk Appraisal and Insight (RAI) and the Occurrence of Negative Events of Projects (IN)***

Table 7.67 shows the correlation values for the relationship between the two latent clusters of “risk appraisal and insight” and IN. The largest negative correlation at 0.01 significance level is -0.254. This correlation is between RAIG1 “risk alignment process” and IN8 “lack of reporting to board and executives” of IN. The smallest negative correlation at 0.01 level of significance is -0.194. This correlation is between SG1 “risk alignment process” and IN9 “our organization is experiencing failure to achieve the business objectives”.

Table 7.67: Association between risk appraisal and insight (RAI) and the occurrence of negative events of projects (IN)

	RAIG1	RAIG2
IN1		
IN2		
IN3		

IN4		
IN5		
IN6		
IN7		
IN8	-.254**	-.215*
IN9	-.194*	
IN10		

7.7.5.3 *Association between Risk Management Governance (RMG) and the Occurrence of Negative Events of Projects (IN)*

Table 7.68 shows the correlation values for the relationship between the two latent clusters of RMG and IN. The largest negative correlation at 0.01 significance level is -0.285. This correlation is between RMGG2 "risk control" of RMG and IN8 "lack of reporting to board and executives" of IN. The smallest negative correlation at 0.05 level of significance is -0.190. This correlation is between RMGG1 "risk governance" and IN5 "governance model fails to manage key projects".

Table 7.68. Association between risk management governance (RMG) and the occurrence of negative events of projects (IN)

	RMGG1	RMGG2
IN1		
IN2		
IN3		
IN4		
IN5	-.190*	
IN6		
IN7	-.243**	
IN8	-.282**	-.285**
IN9	-.227*	
IN10		

7.7.5.4 *Association between Review Risk Development and Decision (RDG) and the Occurrence of Negative Events of Projects (IN)*

Table 7.69 shows the correlation values for the relationship between the three latent clusters of RDG and IN. The largest negative correlation at 0.01 significance level is -0.257. This correlation is between RMDG2 "effectiveness assurance" of RDG and IN8 "lack of reporting to board and executives" of IN. The smallest negative correlation at 0.01 level of significance is -0.226. This correlation is between RDG3 "monitoring of risk exposure" and IN8 "lack of reporting to board and executives".

Table 7.69. Association between review risk development and decision (RDG) and the occurrence of negative events of projects (IN)

	RDG1	RDG2	RDG3
IN1			
IN2			
IN3			
IN4			
IN5		-.205*	
IN6			
IN7		-.225*	
IN8		-.257**	-.226*
IN9			
IN10			

7.7.5.5 *Association between Risk Communication (RC) and the Occurrence of Negative Events of Projects (IN)*

Table 7.70 shows the correlation coefficients for the relationship between the three latent clusters of RCG and IN. The largest negative correlation at 0.01 significance level is -0.281, which is between RCG1 "risk communication" of RDG and IN6 "existence of unresolved issues and disputes" of IN. The smallest negative correlation at 0.05 level of significance is -0.197. This correlation is between RCG3 "risk coordination" and IN6.

Table 7.70. Association between risk communication (RCG) and the occurrence of negative events of projects (IN)

	RCG1	RCG2	RCG3
IN1			
IN2			
IN3			
IN4			
IN5			
IN6	-.281**		-.197*
IN7			
IN8	-.210*	-.217*	-.240*
IN9			-.207*
IN10			

7.7.5.6 *Association between Risk Culture (RCU) and the Occurrence of Negative Events of Projects (IN)*

Table 7.71 shows the correlation values for the relationship between the two latent clusters of RCU and IN. The only negative correlation at 0.01 significance level is -0.210. This correlation is between RCUG1 "risk culture development" of RCUG and IN6 "existence of unresolved issues and disputes" of IN.

Table 7.71. Association between risk culture (RCU) and the occurrence of negative events of projects (IN)

	RCUG1	RCUG2
IN1		
IN2		
IN3		
IN4		
IN5		
IN6	-.210*	
IN7		
IN8		

IN9		
IN10		

7.7.5.7 *Association between Risk Appetite (RAG) and the Occurrence of Negative Events of Projects (IN)*

Table 7.72 shows the correlation values for the relationship between the two latent clusters of RAG and IN. The only negative correlation at 0.05 significance level is -0.196. This correlation is between RAG1 "risk appetite" of RAG and IN8 "lack of reporting to board and executives" of IN.

Table 7.72. Association between risk appetite (RAG) and the occurrence of negative events of projects (IN)

	RAG1	RAG2
IN1		
IN2		
IN3		
IN4		
IN5		
IN6		
IN7		
IN8	-.196*	
IN9		
IN10		

7.7.6 *Association between Project Success (RGP) and the Occurrence of Negative Events of Projects (IN)*

Table 7.73 shows the correlation values for the relationship between the three latent clusters of RGP and IN. The highest positive correlation at 0.01 significance level is 0.311. This correlation is between RGP1 "efficient project delivery" of RGP and IN1 "our organization is experiencing schedule delays" of IN. The smallest positive correlation at 0.05

significance level is 0.192. This correlation is between RGP2 “efficient risk monitoring” of RGP and IN4 “our organization experienced projects failure in the past” of IN. The smallest negative correlation at 0.05 significance level is -0.200, which is between RGP2 “efficient risk monitoring” and IN7 “lack of independent monitoring of progress”. The largest negative correlation at 0.05 level of significance is -0.210, which is between RGP3 “effective project risk management” and IN7.

Table 7.73. Association between project success (RGP) and the occurrence of negative events of projects (IN)

	RGP1	RGP2	RGP3
IN1	.208*	.193*	.194*
IN2	.311**	.286**	.262**
IN3			-.204*
IN4		.192*	
IN5			
IN6			
IN7		-.200*	-.210*
IN8			
IN9			
IN10			

7.7.7 *Association between the new latent clusters of Occurrence of Negative Events of Projects (INP) and the Occurrence of Negative Events of Projects (IN)*

Table 7.74 shows the correlation values for the relationship between the two latent clusters of INP and IN. The highest positive correlation at 0.01 significance level is 0.917. This correlation is between INP1 “governance failure” and IN7 “lack of independent monitoring of progress” of IN. The smallest positive correlation at 0.01 significance level is 0.413, which is between INP1 “governance failure” and IN2 “our organization is experiencing cost overrun” of IN.

Table 7.74. Association between occurrence of negative events of projects (INP) and the occurrence of negative events of projects (IN)

	INP1	INP2
IN1	.434**	.787**
IN2	.413**	.840**
IN3	.839**	.511**
IN4	.524**	.790**
IN5	.852**	.612**
IN6	.556**	.861**
IN7	.917**	.547**
IN8	.842**	.643**
IN9	.860**	.534**
IN10		

7.7.8 *Association between Internal Audit Function (IAF) and the Occurrence of Negative Events of Projects (IN)*

Table 7.75 shows the correlation values for the relationship between the three latent clusters of IAF and IN. The highest positive correlation at 0.01 significance level is 0.359, which is between IAFR1 "role of internal audit" and IN2 "our organization is experiencing cost overrun" of IN. The smallest positive correlation at 0.05 significance is 0.186, which is between IAFR1 and IN4 "our organization experienced projects failure in the past" of IN. The largest negative correlation is -0.277, which is between IAFR3 "provision of audit reports" and IN7 "lack of independent monitoring of progress". The smallest negative correlation at 0.05 level of significance is -0.192, which is between IAFR3 and IN5 "governance model fails to manage key projects".

Table 7.75. Association between internal audit function (IAF) and the occurrence of negative events of projects (IN)

	IAFR1	IAFR2	IAFR3
IN1	.211*		

IN2	.359**		.206*
IN3			
IN4	.186*		
IN5			-.192*
IN6	.202*		
IN7	-.199*		-.277**
IN8		.209*	
IN9			
IN10			

Finally, it is essential to interpret results from this section as well as to discuss implications for the research. In general, this section analysed the correlation between various factors, including the determinants of risk governance as well as internal audit function, in case of negative events in the organisations. One of the primary findings of this analysis is that the lack of reporting to boards and executives was found to be one of the central aspects that influence the emergence of adverse events in the organisations. The majority of respondents underlined the significance of this factor. Another aspect that could be mentioned is the existence of unresolved issues and disputes, which was also mentioned more frequently among other negative factors. The lack of independent monitoring of the progress is another factor that is considered as significant by the respondents.

In general, these results represent an overall picture of how different variables from the conceptual framework impact the occurrence of negative events in organisations. The interpretation of these results provides important implications for the further discussion. For example, the information which is retrieved from this section serves as the evidence for the third hypothesis, which was formulated as the part of the conceptual framework.

7.8 Summary

For the conclusion of this chapter, it is essential to elaborate on the overall relevancy of the results as well as to discuss their importance for the study. First of all, the development of this chapter highly correlates with the conceptual framework that was formulated in Chapter 5. The questionnaire that was developed for retrieving information from the participants was based on the areas of concern from the conceptual framework, which are the following: the determinants of risk governance, their correlation with the project success and the occurrence of negative events in projects, as well as the role of the internal audit function in mediating the relationship between the determinants of risk governance and project success. The sample of participants was considerably lower that it was initially projected; however, it was still sufficient for carrying out the research. The answers that were retrieved from the completed questionnaire serve as the basis for performing the reliability analysis as well as creating descriptive statics of the variables included in the research.

As it is apparent that results of this chapter correlate directly with the conceptual framework developed in Chapter 5, it can be stated with certainty that these findings are relevant and important to the study to a significantly high extent. On the basis of these results, the further, more elaborated analysis of factors and variance is carried out. Additionally, this section provides a detailed description of the population that formed the final sample. Also, it preliminary provides the evidence for the crucial importance of the employment of the conceptual framework for assessing risk governance efficiency. In general, this section's results represent the primary scope of the thesis as they provide the evidence-based findings for every important aspect of the conceptual framework, which were formulated in the form of the research hypotheses.

Chapter 8: Discussion

8.1 Introduction

Risk governance strategies are evolving in line with the changing internal and external forces in an organisational setting. According to Bai (2014), the emerging technologies, increasing globalisation, and advancements in various sectors of the economy have created a new platform for auditing and managing risks in the modern society. The ability of the management to identify threats early enough in a given project and deal with them effectively is a critical ingredient of the success of any institution. The internal auditors must understand the primary goals of each programme, the expected dangers that it may encounter, and how such risks can be managed using the available resources within an organisation. Nguyen, Bhagavatulya, and Jacobs (2017) explain that risk management has become a critical concern in the United Arab Emirates' public sector.

Over the past two decades, the government has been investing heavily in infrastructural development to promote the growth of various sectors of the economy such as tourism, trade, and hospitality among others (Ellis & Sherman 2014). Some of the mega-developments sponsored by the government include construction of roads, rails, airports, public parks, and mega-buildings. These programmes are worth billions of dirhams and are fully funded by public resources. As mentioned in the literature review, most of these mega public projects have registered impressive success, but the delay has been a common problem in almost all of them (Ellis & Sherman 2014). Other challenges also exist that may affect the ability to realise the desired outcome in these important programmes. Failure of such an undertaking would result in the loss of billions of dirhams that would have been used in other projects.

It is the responsibility of the managers and departmental heads to ensure that each task achieves the intended goal within the stipulated time. Internal measures must be taken to identify factors that are likely to derail the progress of each programme. Public projects are often audited by the Financial Audit Department (FAD) in the Government of Dubai, but as Abed (2014) notes, the external auditor may not influence the success of a development plan. In most of the cases, the external (Governmental) auditors' primary goal is to evaluate how public resources were spent and to determine if those trusted with public funds misappropriated it. It means that the external auditors' work is necessary after its completion or at the end of the financial year. Internal auditors play a critical role in defining the success of a venture because they can identify mistakes before they can have a devastating impact on a project.

As Abed (2014) states, the internal auditors not only focus on financial risks but also any other threat that may affect the overall success of a project. They start by identifying all the possible threats that may occur at every given stage before it is initiated. They then work with all the other stakeholders related to the venture to determine if any of the expected risks has occurred so that corrective measures can be taken to avert the undesirable consequences. The integrated approach to risk management is vital in enhancing the success of these activities. In this section of the paper, the focus will be to discuss the outcome of the analysis primary data in light of the information that was gathered in the review of the literature.

8.2 The Existing Determinants of Risks Governance in the Public Sector

1- What are the existing determinants of risks governance in public sector?

Mega public projects are always subject to numerous dangers, some of which may completely paralyse the ability to achieve the desired goals. Identifying the relevant determinants of risk governance in the public sector is critical in enhancing the success of these programmes. The determinants enable the stakeholders involved in the task to come up with appropriate plans on how to counter challenges that may arise at different stages of the implementation. In chapter 3, the existing determinants of risks governance have been analysed to determine their relevance. The analysis has identified 10 key factors based on the data that was collected from the sampled respondents. They include strategy, risk appraisal and insight, risk decision and process implementation, risk management and governance, review risk development and decision, and risk communication. Others include risk culture, financial and technical capacity, risk appetite, ownership. In each of the above factors, different determinants of risks governance have been identified and their Cronbach alpha indices indicated. Figure 8.1 below is a summary of these factors.

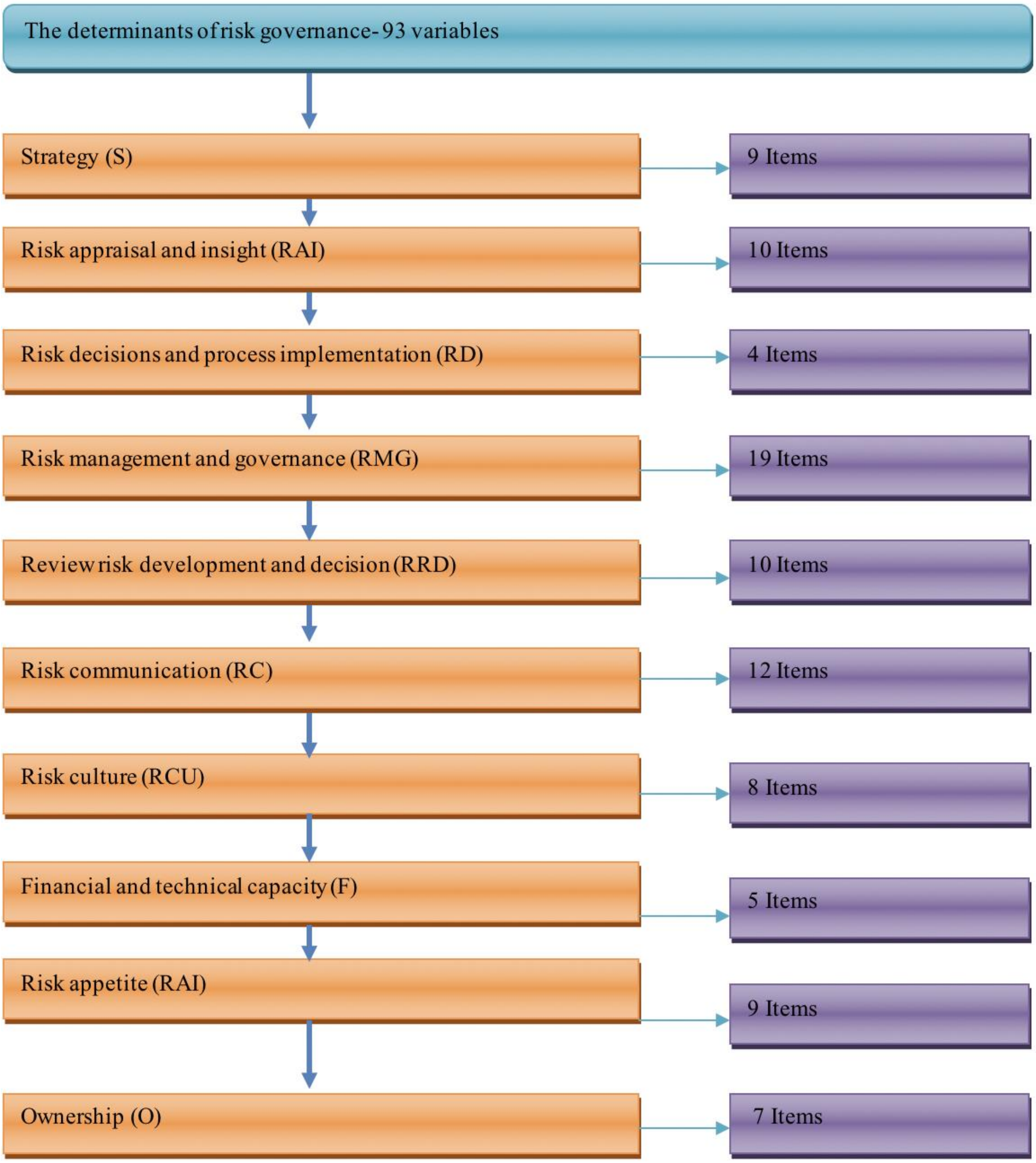
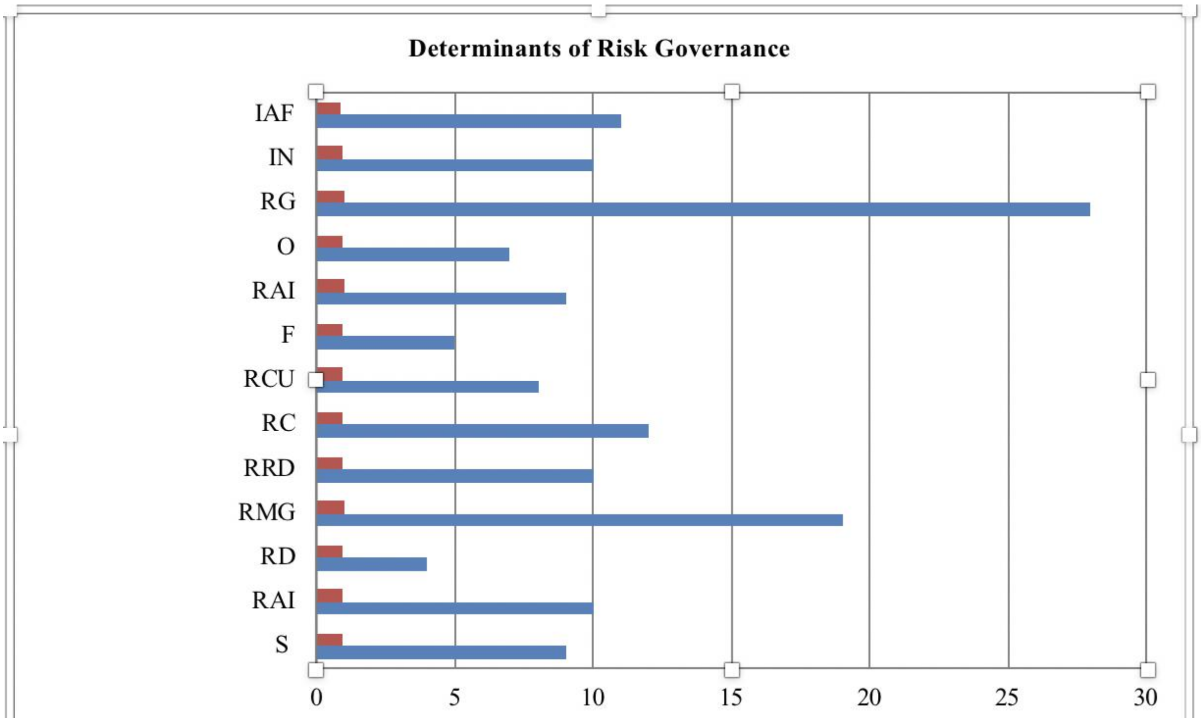


Figure 8.1 Determinants of Risk Governance

As shown in the above figure, each of the factors has different determinants of risk governance. The figure below shows the number of determinants in each of the 13 factors and the average weighted mean of their Cronbach's alpha defining their relevance to the success of a public project.



	S	RAI	RD	RMG	RRD	RC	RCU	F	RAI	O	RG	IN	IAF
Average weighted mean	0.94	0.97	0.924	0.974	0.959	0.951	0.94	0.904	0.978	0.923	0.986	0.922	0.834
No. of Factors	9	10	4	19	10	12	8	5	9	7	28	10	11

Figure 8.2 Determinants of risk governance

The first factor is the strategy with 9 determinants of risk governance with an average weighted mean of .940. The strategy that is used in managing risks defines how successful public projects can be under various prevailing circumstances. According to Abed (2014), one of the most important strategies when undertaking mega public projects is change management. New technologies may emerge that can enhance the level of success of the involved activities. The entire team must be capable of switching from one strategy to another without strain. It all depends on the strategies used by the management. The strategies used in identification, quantification, classification, and management of risks should be clear and understandable to all the relevant stakeholders. The outcome of the primary data analysis shows that the flexibility and proactive nature of the strategies must be emphasised to ensure that hazards do not create a crisis in case they occur.

Risk appraisal and insight was the second factor in the analysis, and it had 10 determinants of risk governance. Once a given risk factor has been identified, the next important stage is the assessment. The first stage of risk appraisal should be done during the stage of planning. At this stage, all the possible risk factors that may be encountered in the project should be identified and thoroughly assessed both qualitatively and quantitatively. The nature of the anticipated threats should be clear to the management so that they can make informed decisions about them. The second stage of risk appraisal is conducted when they occur. Bai (2014) says that at this stage, the chief risk officer (CRO) will evaluate the threats to determine its magnitude. When reporting about the hazard, the officer should explain whether its magnitude is within what was anticipated. The classification should state if the magnitude of the risk that has occurred is below, within, or above what had been anticipated. An effective appraisal helps in defining the right action that should be taken.

Risk decisions and process implementation, with 4 determinants of risk governance, was identified as an important factor in the in risk management process. According to Popov, Lyon, and Hollcroft (2016), the management should have a clear pattern of responding to risks under various categories. Some calculated risks may be taken after determining how they can be managed and their benefits to the organisation while others have to be avoided. Having a clear mechanism upon which decisions are made enables the top managers to avoid confrontation with junior officers who may want to embrace a given dangerous activity when implementing a proposed project. The junior officers will be able to evaluate and classify risks based on the set parameters. They can then predetermine the likely decision that will be favoured by the programme manager or senior authorities. When a proposal is rejected based on the risks involved, they will understand the parameters that were used by the relevant authorities. Such systems improve cohesion among the team members.

Risk management and governance is another important factor average weighted Cronbach's alpha mean of .974. When the management decides to take specific calculated risks, Verzuh (2015) advises that there should be effective mechanisms put in place to manage them. For instance, if it is decided that an artificial island is to be constructed in Dubai, the dangers are known. One of the main risk factors in such a delicate initiative is the possible injury or even death of the workers involved in the project. The process of management involves defining the security of the workers. The team must be proactive in managing such risks by coming up with proper safety measures for all those involved in the activities. Rapid response unit should always be in place in case the undesirable events happen despite the existence of safety measures.

An effective communication is an integral factor in risk management. Some of the mega public projects involve numerous activities that have to be conducted by different individuals. Risks may be detected at various levels by any of the workers assigned to the venture. Once it is detected, measures should be put in place to manage them. Vinnem (2013) explains that immediate actions can only be taken if there is an effective communication platform. Junior employees should be capable of engaging their supervisors whenever they suspect that there is a problem in their respective workplace. Once the information is passed to the supervisors, there should be prompt response to investigate and ascertain its nature and what should be done to address it. The top managers should be capable of engaging the junior officers with policy recommendations on how such an issue should be dealt with in the affected department. Bai (2014) argues that when an effective platform of communication is created, it becomes easy to address issues that emerge in such projects at the right time.

The primary data collected from the respondents identified risk culture as an important factor that should be promoted when undertaking mega public initiatives. The analysis proposes the use of risk champions to promote a culture where individuals do not shy away from major initiatives because of the fear of the associated dangers. As Vinnem (2013) argues, risk management and risk avoidance are two different concepts. Risk avoidance is a cowardly approach to managing threats by evading tasks associated with feared risks. In some cases, it may not be possible to avoid these dangers. Risk culture promotes an approach where employees are able to take calculated risks, come up with measures of managing their consequences with the primary goal of achieving the high returns associated with such projects. The culture also requires the members to understand which risks are worth taking and which should be avoided based on the degree and nature of their impact, the ease with which they can be managed, and the resources needed. It also seeks to regulate risk appetite among the managers as a way of protecting the outcome.

The financial and technical capacities are critical factors that define the level of success of public projects. Some of the recent mega developments undertaken by the Dubai government require a substantial amount of financial resources and technical expertise. Before starting the planned activities, the required resources should be explained in details, including those that may be needed to manage various risks. The approving authorities will need to ascertain the availability of the needed resources before allowing the implementation of the proposal. Vinnem (2013) states that if a project will take five or more years to be completed, it is important to ensure that the needed resources within that period will be available. The technical capabilities of the taskforce trusted with the ventures should be in line with the project requirements. When constructing Burj Khalifa, the world's tallest building, the government was forced to outsource because of the limited technical skills locally. The chief architect and some of the engineers came from Europe and North America (Vinnem 2013). Although it is always desirable to use internal workforce, sometimes it may not be possible to avoid outsourcing. The most important thing is to ensure that the required skills and experience is available before the activities can be started.

8.3 The latent clusters of the existing determinants

In the Factor Analysis chapter, the existing determinants of risks governance, project success, occurrence of negative events of projects and Internal Audit Function have been analysed to determine their relevance. The researcher has identified the following factors in order to identified the new latent clusters as illustrated below:

- Strategy (S)
- Risk appraisal and insight (RAI)
- Risk management and governance (RMG)
- Review risk development and decision (RRD)
- Risk communication (RC)
- Risk culture (RCU)
- Risk appetite (RA)
- Project success (RG)
- The occurrence of negative events of projects
- Internal audit

Each of the ten factors above has different variables and with varying Cronbach's alpha based on the primary data analysis. The following figure 12.3 provide the new latent clusters of these factors and the variables.

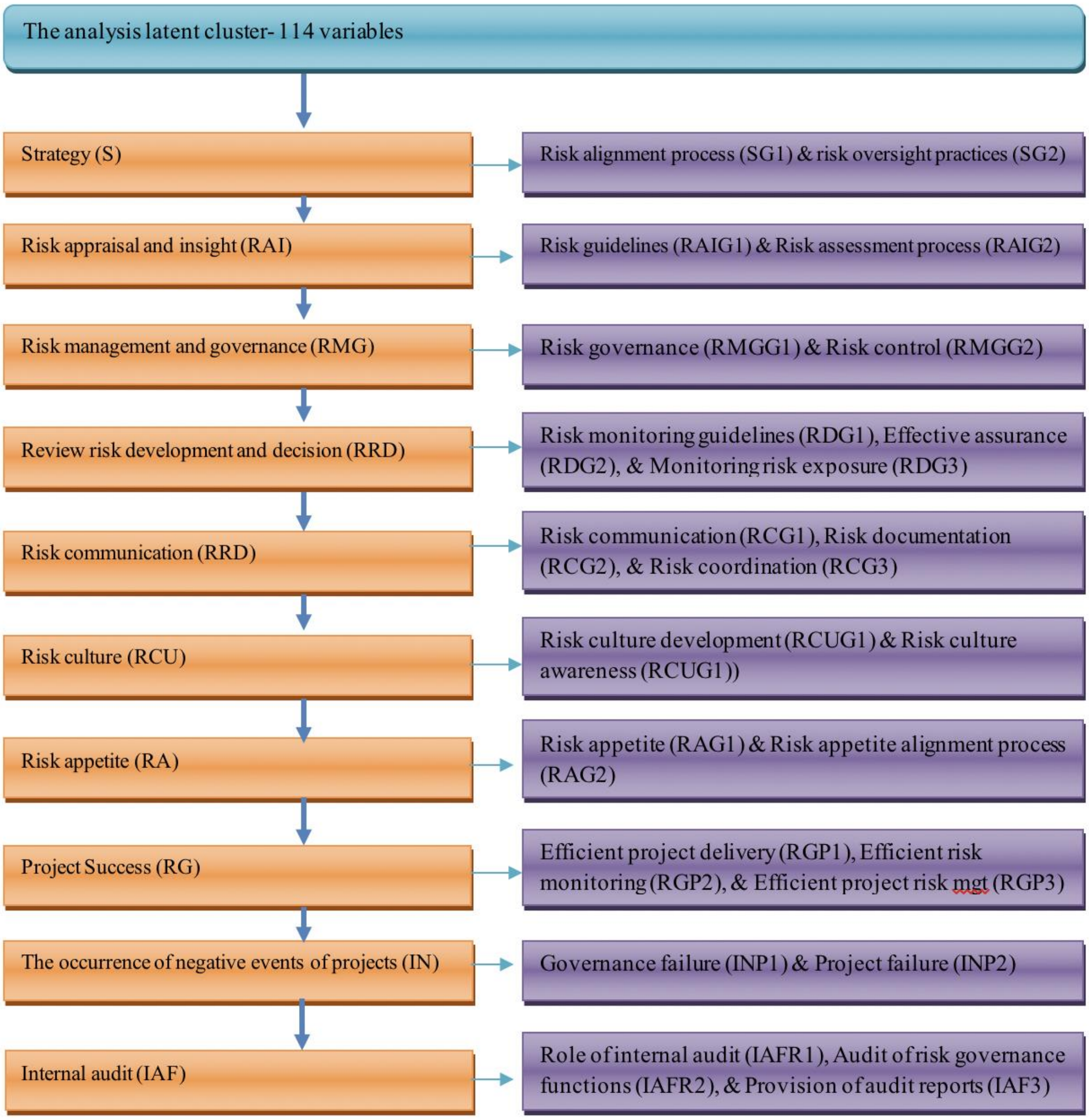


Figure 8.3. The new latent clusters

As shown in the above figure, each of the factors has different new latent clusters includes determinants of risk governance, project success, occurrence of negative events and Internal Audit Function.

The first factor is the strategy with 8 determinants of risk governance with an average weighted mean of .940. It has two latent clusters of risk alignment process (SG1) and risk oversight (SG2).

Risk appraisal and insight was the second factor in the analysis, and it had 8 determinants of risk governance divided into two clusters. The two clusters include risk guidelines (RAIG1) and risk assessment process (RAIG).

Review risk development and decision, with 8 determinants of risk governance, was identified as an important factor in the risk management process. It had three clusters, which include risk monitoring guidelines (RDGA), the effectiveness of assurance (RDG2), and monitoring of risk exposure (RDG3).

Risk management and governance is another important factor average weighted Cronbach's alpha mean of .974. The analysis shows that it has 19 factors in two different clusters. The clusters include risk governance (RMGG1) and risk control (RMGG2).

Risk communication is another crucial factor identified in the analysis. It has 12 items in three different clusters. The clusters include risk communication (RCG1), risk documentation (RCG2), and risk coordination (RCG3).

The primary data collected from the respondents identified risk culture as an important factor that should be promoted when undertaking mega public initiatives. It had seven items in two different clusters. The clusters include risk culture development (RCUG1) and risk culture awareness (RCUG2).

The analysis also shows that risk appetite is a critical factor that cannot be ignored in public project. The factor had 9 items in two clusters. The clusters are risk appetite (RAG1) and risk appetite alignment process (RAG2).

8.4Determinants of Project Success

2- What are determinants of project success?

The success of public undertakings depends on a number of factors. In the literature review, different internal factors of a plan were identified, and their interrelationships discussed. In the previous chapter, the researcher identified a variety of determinants which are directly related to the success rates of public projects. According to Verzuh (2015), the rate of success of a project depends on how effectively the occurrence of negative events can be controlled within an organisation. When the occurrence of negative events is minimised as much as possible, then the rate of success can be relatively high. In the analysis primary data done in the previous chapter, it was established that determinants of risk governance are inversely proportional to the occurrence of negative events of projects. The determinants of factors of occurrence of negative events (IN) demonstrate this fact, as discussed below.

The analysis of the primary data demonstrates that cases of scheduled delays have an adverse impact on the success of a programme. On the determinant ‘our organisation is experiencing schedule delays’, the respondents felt that it was one of the main hindrances to project success, with a Cronbach’s alpha of .919. Schedule delays extend the time before which a project can yield the desired returns. The analysis shows that when a given set of activities is not completed as per the schedule, there may be a ripple effect on other subsequent activities. Such delays make projects worth less than the predetermined value.

Cost overrun is a negative occurrence whose impact on a project may have devastating consequences. In the analysis of data collected from the respondents, an organisation experiencing cost overrun had a Cronbach’s alpha of .918, which shows how dangerous it is on a project. It occurs when the management fails to come up with proper plans for a project. Verzuh (2015) advises that before the initiation of the set activities, the budget of the project should be thoroughly evaluated, including the possible costs of managing the anticipated risks. Determining all the possible risks and developing effective plans for managing them help in eliminating cases of cost overrun.

Governance model failure to manage key projects was another major issue identified in the analysis, with a Cronbach’s alpha of .911. Successful project managers know that it is crucial to clear steps of prioritising and managing key project activities. There should be a step-by-step procedure of what should be done once a given risk factor is identified. The management policies of addressing risks eliminate cases where different approaches are used. It is necessary to identify best practices in risk management both locally and internationally (Dempsey 2014). The management should then develop management policies and framework based on these best practices. Although different risk factors may need a different approach to management, the organisation should know that a given standard procedure must be followed that identifies various steps in risk management.

The lack of reporting to board and executives was identified as another major area of concern in managing public projects, with a Cronbach's alpha of .910. The analysis shows that it is important for the risk management team to maintain regular communication with the board and top executives to ensure that issues that affect the operations of the programme are discussed and addressed promptly. Having someone who is primarily responsible for the delivery of the reports is critical to achieving success with a project. The Officer will be responsible for analysing various risks, their possible consequences, and how they can be managed using available resources before making the reports (Wassenaer 2017). The officer will work closely with employees who are assigned different roles within the project to ensure that issues that emerge are addressed effectively and within the right timeframe. The information sent to the executives should include possible ways in which the risk factors can be managed, time that is needed, and the resources required. The board may also want to know the consequences of the failure or delay in addressing the issue.

The lack of control over the projects phases, with a Cronbach's alpha of .914, is a negative event whose occurrence may have a serious impact on the success of a project. When handling a mega public project, each of the phases should be defined in clear terms. The individuals involved in each phase, the time needed to complete the phase, and the resources that should be provided must be stated. A tight control of each phase is needed to ensure that the next phase can be initiated within the set timeline (Verzuh 2015). When the management lacks control over the project phases, it becomes possible to realise the set goals. Vinnem (2013) argues that such occurrences show a sign of limited planning in the project. It also an indication that those trusted to manage the activities lack leadership skills needed to coordinate and control the workforce.

The existence of unresolved issues and disputes can have a devastating impact on a major public project. The analysis of the primary data assigned this factor a Cronbach's alpha of .914. Issues and disputes in public projects may emerge because of unlimited consultation. According to Dempsey (2014), government agencies are always expected to consult widely with the public and other relevant stakeholders to address all the conflicting interests that might exist. The support of all the relevant stakeholders is necessary to avoid possible litigation or sabotage by people who feel aggrieved when the project is implemented. Sometimes it may not be possible to meet needs of everyone in the manner they would desire. In such cases, an effort should be made to reach a common ground. There should be a compromise that everyone is comfortable with before starting the project.

The lack of independent monitoring of progress, which had a Cronbach's alpha of .910, was another major issue that was identified in the analysis. A project should have its internal auditing mechanism that focuses on identifying risks as soon as they emerge so that they can be addressed promptly. However, sometimes it may be necessary to have an independent monitoring system to monitor the progress of the project. The Project managers will be kept active because of the knowledge that an internal auditor will also review the work. Sometimes these internal auditors may help in identifying major issues which may affect the overall success of the project but were not identified by the project managers or risk officers. In public projects, the independent auditors may report to the head of the department or any other relevant governmental authorities in case corrective measures are necessary.

An organisation experiencing failure to achieve its business objectives is one of the major negative events with serious consequences for the success of a project. The analysis of primary data shows that it had a Cronbach's alpha of .913. Public projects are always costly. They are undertaken to help in addressing specific issues within the country as defined in the objectives. When a given initiative fails to meet the set objectives upon completion, it is a sign that the resources spent have been wasted. The opportunity cost could be huge if it was a major project that took years to complete and consumed millions of dirhams in the process. Wassenaer (2017) says that the inability to achieve business goals is a sign of poor auditing. It is an indication that the project manager and the entire team did not take time to ensure that all activities are undertaken as per plan. Other issues include past project failures and loss of opportunity cost. Table8.1 below identifies the occurrence of negative events that may have serious consequences for the success of a project.

Research Question	*What are determinants of project success*?
Hypothesis	H_A1: Determinants of risk governance are negatively related to the occurrence of negative events of projects.
Results	The ANOVA analysis results indicate that: The analysis shows that determinants of risk governance reduce chances of occurrence of negative events in a project. Understanding and embracing these determinants in public projects limit the occurrence of risks.
Researcher Observation	The analysis of primary data and information collected from the sampled respondents strongly suggest that determinants of risk governance reduce the incidence of negative events. • The respondents stated that schedule delays may have a significant impact on the public project. It may raise the cost of a project if urgent measures are not taken to manage it.

	• The information collected from the secondary sources is supported by the primary data. The lack of control over the projects phases may have serious consequences for a project. • The existence of unresolved issues and conflicts may have a serious impact on a project. It may create disunity among the concerned stakeholders. • The inability to control project phases is an undesirable occurrence that should not be tolerated. It is a sign of lack of proper leadership. • Project managers should always do everything within their powers to avoid cost overrun.
Conclusion	The alternative hypothesis H_A1 *(p>0.05)there* is no enough evidence to reject it for various determinants discussed above (IN1, IN2, IN3, IN4, IN5, IN6, IN7, IN8, IN9, IN10)

Table 8.1: Occurrence of Negative Events

8.5Audit Function Tasks in Managing the Risks in the Public Sector

3- What are the audit function tasks in managing risks in the public sector?

Internal and external auditing of public organisations is crucial in enhancing the rate of success of public projects in addition to that assessing the effectiveness of the risk management governance framework. The review of the literature, conducted in the previous chapters, strongly suggests that internal auditing is critical in ensuring that a range of functions are conducted using the planned resources and within the right time. Unlike external auditing that often comes after the end of the programme or annually, internal auditing is more regular and focuses on identifying risks at the earliest stage possible and addressing them to enhance the success of a given initiative. In public projects, given risk factors that go undetected or are ignored by have serious consequences on the overall performance of a project. The analysis of primary data has identified various audit functions in managing risks in public organisations.

The existence of internal audit process to implement formal risk management programme was one of the important factors that enhance the success of public projects. It had a Cronbach's alpha of .943 based on the analysis of primary data. The respondents noted that having an internal audit process is necessary in creating a formal risk management programme in case if the Risk management function is not available in the organisational chart. According to Dempsey (2014), having a formal risk management programme creates a clear pattern of managing risks in an organisational setting. It outlines what stakeholders should do every time they encounter risk patterns. A clear channel of communication is developed that enables the affected individuals or department to coordinate with other departments to ensure that the risk is managed effectively.

The existence of a whistle-blowing mechanism, with a Cronbach's alpha of .96, is one of the most important audit functions in public programmes. In mega public projects, cases of Fraud or theft of public resources can take place at different stages of implementation, and sometimes the employees might have some collusion with the suppliers, contractors and third party. Theft may occur at the highest level of management, among the mid-managers, or at the lowest level of management. Vinnem (2013) notes that not everyone is often involved in such cases of theft. When misappropriation of public resources happens among the top managers, reporting such cases become a complex process. Those who should receive such reports and act upon them are the ones involved in the theft. It means that internal auditing may be jeopardised by those in power. In such instances, whistle-blowing becomes the only way of addressing fraud and mismanagement of public ventures.

Public projects should have mechanisms through which employees, irrespective of their managerial positions within the firm, can report cases of theft or mismanagement to the board or external stakeholders without facing victimisation from colleagues or senior managers. When such platforms are created, everyone involved in the management of public ventures will know that they are not above the law. They will know that their actions can be exposed to the public and they can be subjected to disciplinary actions by higher authorities. Whistle blowers should be offered the most secure platforms for sharing their concerns. In case it is impossible for a whistle-blower to hide his identity, mechanisms should be put in place to ensure that their personal security and the security of their job are assured.

The existence of internal audit as an assurance task has been identified as another important factor, with a Cronbach's alpha of .974. The government and members of public always want an assurance that their resources will be spent responsibly and without any major embezzlement. The only way of giving the assurance is to have a robust and uncompromised. Members of the public need an assurance that internal auditors will not be tempted to collude with programme managers or other relevant authorities to steal public funds or intervene in the operation and implementation of the projects. According to IIA standards A degree of independence should be exhibited among the internal auditors. Dempsey (2014) explains that although internal auditors are expected to work closely with managers to ensure that goals and objectives of the project are realised, they should be allowed some form of independence that allows them to report to board and external authorities in case internal systems of managing risks are compromised. Under normal circumstances, the auditors should make internal reports to the managers or other relevant internal authorities. However, when no proper action is taken internally, mechanisms should exist for them to contact relevant higher authorities for corrective measures to be taken. The goal should always be to protect public resources from wastage or theft. The auditors should also ensure that those assigned specific tasks have the right skills and experience to deliver on their promise. Any weakness or discrepancies should be addressed effectively and within the shortest time possible.

The analysis of primary data shows that another important audit factor is the existence of guidelines for board/audit committees' oversight. Having the position of chief risk officer was identified as being critical to the success of public ventures. The existence of audit committee oversight is equally important, especially when handling mega public initiatives. Auditing of a public project is a complex and multifaceted process that cannot be trusted with one individual. The competencies of various workers, the use of assigned resources, and the time spent engaging in related activities, the level of technology involved, the effectiveness of coordination among departments or teams, and how well the outcome of the project is aligned with departmental goals are some of the factors that require regular auditing. Having an oversight committee will ensure that these tasks are centralised and conducted in a coordinated approach. Each of these areas of auditing may require experts, but they should report to the board chairperson who will then find a way of communicating with the relevant authorities for appropriate actions to be taken. Dempsey (2014) explains that the audit committee may be appointed by the head of a government department to work closely with the Internal Audit, but to exercise some degree of independence whenever necessary.

The existence of the process for risk culture audit had a Cronbach's alpha of .939, which makes it one of the most important audit functions in an organisational setting. It is impossible to avoid risks when undertaking public ventures because some of them are subject to natural forces. That is why many organisations are embracing risk culture when undertaking major projects. They appreciate the fact that risks can occur at any time and that the most important success factor is how they are mitigated. However, Dempsey (2014) warns that when embracing the risk culture, care should be taken to avoid negligence, complacence, and any other practices that may make employees ignore dangers associated with different threats. Risk culture audit is meant to ensure that employees understand the need to make a quick and effective response to risks instead of ignoring them. The auditor will promote a culture of quick response to any form of threat that may affect the progress of a project, from the onset to the final stage when it is ready for the handover.

The analysis of the primary data shows that one of the most important internal audit functions is to provide assurance through written audit reports over the entity-wide risk management process. The factor had a Cronbach's alpha of .834. Internal audit reports are often used by external auditors to evaluate and understand the activities undertaken by various stakeholders in a given venture. documented them in written format makes it possible to store them for future use. According to Zhu, Pickles, and He (2017), having such reports in formal writing is critical when undertaking long-term projects that can last for over three years. The reports help in determine the pattern of risks and how they can be addressed should they occur in future. The management can revisit the records and review how similar risks were addressed in the past, and the outcome of the strategies applied. Using such information, it is easy to come up with new improved strategies that can yield a better outcome than the previous strategies. A written record is a further proof that actions that every stakeholder takes will be taken into account and that every individual will be held responsible for their decision. For any mistake or misappropriation of resources that happens within the organisation, there will be records to help in tracing the responsible individuals so that appropriate actions can be taken.

Provide assurance on the Development of organisational policies for risk management processes is a crucial internal audit function if the Risk management function is not available in the organisation chart. As Wassenaer (2017) observes, different risk factors may require different approaches to ensure that they are managed in an appropriate manner. The risk that arises from misappropriation of public resources may require a different approach from that used when addressing threats associated with natural disasters. Coming up with relevant policies that guide the process of risk management is needed to ensure that there is a uniform way of dealing with risks. The policies should ensure that there is a uniform way of dealing with dangers as enshrined in the organisational culture. Sometimes it may be necessary to categorise risks based on their nature and impact on the firm.

The management can then develop a plan on how each category of risks can be managed to avoid their negative consequences. Public projects may be a short or long term. Short term programmes may last for a few months while long term investments can take as much as five to seven years to be completed. When handling short-term ventures, departmental policies of risk management should be applied. It means that if the project is taken by the Road and Transport Authority (RTA), policies used by the Authority in managing risks should guide the strategies and activities carried by the Authority. On the other hand, if the Authority has a long-term programme that may last for several years, it may be appropriate to allow the manager and the entire team to develop policies that are specific to the venture.

The analysis shows that revision an organisation's risk appetite is another important internal audit function. It had a Cronbach's alpha of .833 based on the analysis of primary data. The concept of high risks high returns often applies in public projects (Dempsey 2014). Some risky undertakings may have high returns if they are managed properly. On the other hand, ventures with low or no risks may have limited returns. It is common to find cases individual assigned to manage specific projects are tempted to take high-risk activities hoping to get impressive profits. Having a team of highly ambitious managers in a given programme is beneficial. They will not fear taking risks or to embrace change as long as they are assured of an impressive outcome. However, some risks may be too dangerous to be embraced in Public projects.

Governmental organisations may need to set risk appetite to ensure that every risk taken is properly calculated to avoid massive organisational loss. This requirement will ensure that unnecessary risks are avoided in major undertakings. According to Wassenaer (2017), mega public projects should avoid two categories of risks. The first category includes risks whose occurrence may have a crippling effect on the progress of the initiative. Another category of risks is those that bring negligible benefits to the organisation. A project should not be subjected to unnecessary risks whose benefits may not be consequential. The factor seeks to ensure that appetite for risks should be regulated when undertaking public ventures. When planning to take a major risk, it may be necessary to consult with the board and top management of the organisation. Table 8.2 below is a summary of these factors.

Research Question	*What are the audit function tasks in managing risks in the public organisations?*
Hypothesis	H_A2: The relationship between the determinants of risk governance and project success are moderated by the Internal Audit Function.
Results	The results from ANOVA indicate that: The analysis shows that internal audit functions define the relationship between the determinants of risk governance and project success.
Researcher Observation	The findings made from the analysis of data primary closely relate with the information obtained from the review of the literature. • The respondents feel that it is important to take risks when undertaking public projects because sometimes it is almost impossible to avoid them. • The respondents believe that internal audit functions are critical when defining risks that should be taken and which should be avoided. Some risks may be too dangerous to embrace while others may have a negligible impact, making them irrelevant in public projects. • It is important to classify risks based on their nature, sources, and impact before coming up with appropriate approaches to dealing with each category. • The results of the analysis strongly suggest that management of risks should be a multi-stakeholder undertaking. Everyone should feel that they have a role to play in their identification and management. • Management of risk appetite is important when undertaking public projects. Project managers and other relevant authorities should know the limit beyond which they should not go when taking risks.

	• Optimal utilisation of financial resources requires an adoption of the risk-based audit. Auditors should analyse risks that an organisation seeks to embrace to ensure that the returns will be worth the risks. • Individuals trusted with managerial positions in public projects should promote a culture where employees are sensitive to risks. Employees should be able to detect and report risks within their areas of jurisdiction within the shortest time possible. • In mega public projects, it is necessary to have an audit committee that can oversee the effective management of risks. • Whistle-blowing should be encouraged among employees assigned to undertaken various tasks in public projects. Systems and structures should be put in place to facilitate whistle-blowing as a way of fighting fraud.
Conclusion	The alternative hypotheses H_A2 *($p>0.05$) there* is no enough evidence to reject for these factors (S8, RMG8, RMG12, RRD4, RCU5, RG20, RG26, IAF5, IAF7, IAF9.)

Table 8.2: Audit Function Tasks

8.6 The Association between Risk Governance and Project Success

4- What is the association between risk governance and project success?

When conducting analysis, it was important to establish the relationship between risk governance and project success. In the literature review, it was determined that the success of a given initiative affected by risk governance strategies that are embraced when undertaking public programmes. One of the most important factors that were established was completing of the set activities on time and using the assigned resources. It had a Cronbach's alpha of .985, which is one of the highest in the analysis of primary data that was conducted. One of the most important stages of idea evaluation before a programme is implemented is financial analysis. Wassenaer (2017) argues that in the stakeholders often evaluate the benefit of the projects by comparing the investment needed and the financial outcome of the activities.

The benefits expected from a given venture, such as a new road network, are often started based on the time the activities are expected to be completed. As such, it is crucial to ensure that the project is completed within the desired time to achieve the set goals. All the risks that may lead to an extension of time should be eliminated within the shortest time possible. One of the consequences of delays in completing the set activities in time is the increase in costs. When the cost of the project is increased, its value that is based on the financial benefits drops. The respondents stated that the problem of delays and inflation of the budget are common problems in public programmes. Addressing such challenges increases the level of success of public projects.

Improvement of the understanding of key risks and their wider implication is another success factor, with a Cronbach's alpha of .985 based on the analysis of the primary data. Every public project is subject to numerous risks. Some of these risks may be caused by natural forces while others come as a result of mismanagement, economic environment, or sabotage. The degree of these risks on the success of a given venture varies. This factor emphasises on the need to understand key risks and areas within the project that they are likely to affect. Individuals trusted with the management of these public programmes should have a comprehensive understanding of various risks and their implications. The knowledge will be needed to know risk factors that need urgent management and those that can be addressed in the course of project implication. Wassenaer (2017) explains that in many cases the relevant individuals need some form or training. They need to be empowered to understand and classify risks based on various factors pointed out in the above section. Their understanding of the risks influences the approach they take in addressing the issues.

The primary data analysis shows that issuance of consolidated reports of disparate risk at board level is an important factor of project success. It had a Cronbach's alpha of .985. Every risk factor that occurs in various organs of project management is often reported to the board and committee responsible for the management of risks. In many cases, these risks are unrelated or dissimilar. However, it is important to come up with a consolidated report of all of these risks before sending it to the project manager or other senior authorities within government departments. In the consolidated report, every risk factor should be critically evaluated. Dempsey (2014) argues that in such a report, cost of addressing the risk should be plotted against the cost of their impact when they are ignored. Strategies needed to address the risk and the resources that should be availed must be stated in the consolidated report. Such a comprehensive report is needed by the top managers when making their decision on the approach that should be taken. They will know risk factors that cannot be ignored based on the resources needed and the consequences that they have on the project.

Sharing projects' risks across departments or sections was another critical factor of success, with a Cronbach's alpha of .985. Some of the public ventures done by different government departments are related in different ways. For instance, an initiative of constructing a new road network that is undertaken by the Ministry of Infrastructure Development and the construction of a delicate bridge that has to be done by the Road and Transport Authority share a lot in common. Both projects can be affected by natural forces such as heavy downpours, flash floods, and limited water supply. They can also be affected in a similar way by factors such as inflation, shortage of construction materials, and misappropriation of funds. Instead of spending a lot of resources managing these risks in the two projects independently, Wassenaer (2017) advises that they can be managed from a united front. It means that managers working on the two ventures will form a single taskforce to deal with the similar problems in the same organisation. The strategy helps in cutting the cost of operation. It also makes it possible to pool together a team of highly specialised employees to deal with these risks in the best way possible. This approach not only saves money for the government but also increases the rate of success of public projects.

The outcome of the analysis of primary data shows that increasing of the management's focus on the key success factor in public projects. It had a Cronbach's alpha of .985. Programme managers play a critical role in ensuring that the vision set by the departmental heads is realised. As a project manager, one has to ensure that all activities are properly coordinated and relevant reports made to the programme manager or other senior managers. Risk management is just one aspect of the many activities that project managers have to undertake. It is not possible for the managers to spent most of their time identifying, evaluating, and managing risks that the projects may face. Most of the time is spent in policy formulation and coordination of the implementation tasks (Dempsey 2014). Having a functional unit that is responsible for risk management creates more time for the managers to focus on other important issues in the project. The unit will evaluate the risk and come up with possible alternatives of addressing the problem based on expert advice from the relevant officers. The manager will only be presented with the set alternatives for the purpose of approval or consultation with other relevant authorities.

Having fewer surprises and crisis was identified as another important risk-based factor that facilitates the success of public projects. It had a Cronbach's alpha of .985. It may not be possible to avoid risks in any public venture, especially the major public projects. However, they should not come as a surprise. Rausand (2013) explains that when a risk factor surprises the project management unit, it limits the ability to respond in an effective manner. It means that the management had not carefully planned for a possibility of its occurrence, and therefore, measures to deal with it were not put in place. Risks that come as a surprise often cause a crisis when managing a project. If it is a major risk factor with far-reaching consequences, it may bring panic among individuals who are required to respond to it in an effective manner. When these people panic, it reduces their capacity to respond to the risk factor in time and with the required focus. According to Burtonshaw-Gunn (2016), a crisis that comes as a surprise is a sign of limited preparation amongst the stakeholders. Before starting a project, the manager, the chief risk officer, and other individuals in the managerial and decision-making positions are expected to outline and analyse all the possible risks. Measures on how to deal with each of these risks should be stipulated before initiating the project. When these risks occur, the management will be adequately prepared to deal with them. They will not come as a surprise and they may not cause a crisis because of the existence of the management plan.

The analysis of primary data also emphasises on the need to put more focus on the efficiency of project phases, with a Cronbach's alpha of .985. The ability to implement the activities successfully and without waste is critical when undertaking public projects. It is possible that mechanisms are put in place to eliminate any form of theft of public resources in a given venture. However, Rausand (2013) warns that wastage of the resources is just as dangerous to the success of a public project as theft. Cases where structures and constructed only to be demolished because of lack of proper coordination or minimal supervision can have a serious impact on the progress of a project. A lot of time and important resources are wasted in such ineffective undertakings. Waste of resources may also come in the form of giving priority to tasks that are less important to the success of an initiative and ignoring fundamental issues in the project. Burtonshaw-Gunn (2016) advises that manager must know how to prioritise tasks when assigning resources. Primary focus should be on the fundamental activities that must be completed at every stage of a project lifecycle. Other issues and activities that are less important can be ignored or addressed after the completion of critical tasks. The managers should also avail resources that are needed and avoid cases of oversupply. When workers are presented with excess supply, caution to use them economically is often lost. They are tempted to misuse these resources knowing that there is more than enough in store.

The capability to take on critical risks in order to get greater a greater reward is another risk audit factor that defines the success of a project. In the analysis of primary data, it had a

Cronbach's alpha of .985. Some programmes are subject to numerous and dangerous risks. However, their returns are impressive. The government of Dubai has initiated some projects with high risks in the recent past. One of them was the construction of Palm Island, the largest manmade island in the world (Burtonshaw-Gunn 2016). Such a mega project had not been implemented anywhere in the world at that time, which meant that it was not possible to embrace best practices. The managers, the engineers, and all the technocrats involved in the project had to come up with an original plan and implement it with military precision. The team knew that risks were plentiful, in the ventures, but the returns were impressive. They studied all the possible risks in the project and came up with a careful plan on how to manage them. Quick response was one of the key factors in enhancing the rate of success of the project. Currently, the island is one of the leading tourists' sites in the country (Agola & Hunter 2016). It has boosted the tourism industry in the country. When taking greater risks, Munier (2014) cautions that proper mechanisms must be put in place to deal with every threat that may emerge at different stages of implementation.

The reassurance of adequate evaluation of risks is another risk-based factor of success based on the analysis, with a Cronbach's alpha of .985. The departmental heads are always responsible for the approval of mega projects before they can be initiated. It is normal for these officers to be presented with numerous proposals of different projects, each with varying costs and benefits. The fundamental factor that defines whether a plan will be approved is its relevance to the department. The top managers will evaluate how well the proposed project will improve systems and activities within the department. Another critical factor is the benefits of the project vis-à-vis the associated costs. When evaluating the proposal to identify those that should be approved, the senior officers always consider the rewards those that promise the highest returns at the lowest costs (El-Karim, Elnawawy & Abdel-Alin 2017). However, it is important to note that occurrence of risks can significantly inflate the cost of a project and reduce its returns. As such, reassurance of adequate evaluation of risks is crucial for the top managers to help them in their decision-making processes. They need to be assured that other than the stated possible risks there will be no other risk factor that may cause panic in the project. They also need an assurance that the plan set to deal with the probable risks (including the proposed time and resources needed) are accurate enough to avoid cases where more resources will be requested.

The level of success of public ventures is subject to the effective management of independent risks. It had a Cronbach's alpha of .985. Most of the risk factors that occur in a project have a ripple effect, especially if they are not addressed in time. For instance, when a foundation slab takes longer than expected to dry up and solidify because of weather pattern that was unexpected, other construction activities will be delayed. Munier (2014) observes that project managers are always keen on addressing such risks first before any other. Although doing so is important, it does not mean that independent risks should be ignored. A risk factor may not have any significant impact on other activities in the initiative, but failure to address it may have far reaching consequences. The project manager and chief risk officer, working with other relevant stakeholders, should be keen on identifying these risks and addressing them within the right time.

According to Lowe (2015), one of the most important factors that should never be ignored when dealing with risks in a project is the management of stakeholder's expectations. This factor had a Cronbach's alpha of .985 based on the analysis of primary data that was conducted in the previous chapters. When implementing a public project such as the construction of a new road network, different stakeholders may have varying expectations. The government's desire will be to have a new durable road that will improve the flow of traffic at the lowest cost possible. Members of public will desire a road network that enables them to reach various places within the city in an efficient way. Some of the stakeholders' expectations may be unrealistic. Members of the public may expect a highly sophisticated road network with underpasses, overpasses, and other modern designs that eliminates intersections and roundabout. They may be expecting superhighways with several lanes to eliminate traffic jams. However, they may not understand the fact that the resources set for the project may not facilitate construction of such an ambitious initiative. The manager, either directly or through the appointed spokesperson of the project, should communicate with all the stakeholders about what to expect. They should be informed about the available resources for the project, the expected outcome, and the benefits it would have (Harris, McCaffer & Edum-Fotwe 2013). Managing their expectation helps in eliminating or at least reducing their dissatisfaction with the venture once it is completed. It ensures that the delivered outcome of the project is as close as possible to what was expected.

A continuous reporting of the key risks dashboard to board and executives was identified as another important success factor, with a Cronbach's alpha of .985. In many cases, the board will demand effective implementation of activities of the project within the stipulated time. They need to be informed about the challenges that the manager and his team are facing in the process of implementing the set policies and tasks. Some major risk factors will need their urgent attention, especially if they have a direct impact on the budget and the set timeline. Such risks should be reported as soon as they are identified to ensure that they are involved in solving them. Other risks may be inconsequential and can be managed easily by the project manager and his team. Lowe (2015) argues that such risks should also be reported while the process of solving them is in progress. The project manager will explain the risk to the board of directors and what being done to address it. Making regular reports of these risk factors enables the board to have full information about the progress of the project. They can make recommendations on how to deal with the issues based on the prevailing forces within the government department. Table 8.3 below is a summary of the factors discussed above.

Research Question	*What is the association between risk governance and project success?*
Hypothesis	H_A2: Determinants of risk governance are positively related to a project's success
Results	The results from correlation indicate that: The determinants of risk governance are positively related to project success.
Researcher Observation	The findings made from the analysis of data primary show that various determinants of risk governance affect the success of a project. • Delivering projects on time and within the set budget was identified as one of the most important success factor in public projects. • The respondents believe that understanding of key risks and their wider implication is a critical risk-based audit task. It explains the approach that the affected stakeholders will take in managing risks. • The analysis emphasises the need to issue consolidated reports of disparate risk at board level. The reports will help in identifying the patterns of different risks in a given project and the best strategy that should be used in addressing them. • Different government departments are encouraged to share risk management practices as a way of improving efficiency and cutting down associated costs. Similar or related projects in different government departments can have a single risk management team. • The top managers should focus more on key issues that affect the strategic goals of the project. Having a team of risk management experts enables the top managers to worry less about various risks and focus more on other important issues within the project. • The risk management team, working closely with other relevant authorities, should ensure that the project is subjected to few surprises and crisis.

	• Efficiency in all the phases of programme management is a critical success factor. The findings of the study show that the ability to implement the projects successfully without waste defines how well the set goals can be achieved. • Although risks are undesirable, they cannot be avoided when undertaking various projects. Sometimes taking greater risks may yield greater returns. • The board or senior managers should be continuously informed about the progress of the project and risks that may affect its success. Their input should be taken into consideration when addressing the risks.
Conclusion	The alternative hypotheses H_A3 *(p>0.05)there* is no enough evidence to reject for these factors (RG1, RG2, RG3, RG4, RG6, RG7, RG8, RG9, RG11, RG12, RG14, RG18, RG19, RG22, RG23).

Table 8.3: Association between Risk Governance and Project Success

8.7 Rating the Importance of Determinants of Risk Governance

5- What is the significance of rating the importance of the determinants of risk governance?

Determinants of risk governance vary in their intensity and the manner in which they affect the progress of a project. Other than the classification of risks, it is also important to rate them in their order of significance to the venture. The analysis of primary data points out the importance of rating the determinants as a way of informing the decision of the project manager and his team. The existence of a process for alignment of risk profile with business and capital management plan was identified as a major factor, with a Cronbach's alpha of .930. It is essential to ensure that risks are profiled, and their alignment with the business and the available resources stipulated in clear terms. It should be clear to the stakeholders how management of such a risk would yield a given magnitude of benefits to the firm. The financers will understand how and why their resources will be spent in managing such risks.

The existence of a mix of qualitative and quantitative risk assessment criteria is an important factor when rating the importance of the risk factors. The factor had a Cronbach's alpha of .966. Qualitative analysis facilitates a clear description of the risk. It includes a description of the nature of the risk, the possible sources, and its qualitative impact on the progress of the project. The qualitative analysis will help in identifying the stakeholders involved in managing the risks and the benefits that shall be realised if it is done within the right time. On the other hand, the quantitative analysis explains the financial implications of the risks. It will explain the statistical implications of the risk and reasons why urgent measures have to be taken to manage it. One of the most important areas of statistical analysis of risks is their financial consequences if they are ignored or if they are not managed at the right time. The decision makers need to know how a given risk factor may reduce the financial benefits of the project in case it is not arrested as per the guidelines provided by the chief risk officer and his team. The other important area of statistical analysis of risks is the financial impact of addressing the risk. The management will need to know how addressing a given risk will decrease the budget of the project beyond what was planned.

The existence of control framework calibrated in line with risk appetite is another factor in the analysis that confirms the importance of rating the importance of determinants of risk governance. The analysis of primary data shows that it had a Cronbach's alpha of .966. Having a team of risk management experts, headed by chief risk officer, may be an assurance to the management that emerging risks will be managed efficiently and within the right budget and time. However, Frynas (2015) warns that the overconfidence in the ability of the team to manage risks may push it too far into embracing risks that may have crippling consequences. Having a calibrated framework of managing risk appetite is very important in enabling the project management team to avid dangerous risks. After rating a given risk factor, it will be assigned a specific value. The control framework will have a calibration with clear instruction of the stage of the risk and whether or not it is worth taking. In the calibration, there will be a point beyond which any risk should not be taken however lucrative it may appear to be. In such cases, the management will not be left in a dilemma on whether to take the risk or not. The framework will issue a clear warning on why it should be avoided, and the seriousness of the consequences in case the warning is ignored.

It is also clear from the analysis that the existence of guidelines for quantification of tolerance for loss or negative events is an important factor, with a Cronbach’s alpha of .969. Loss and negative events may be unavoidable and sometimes even necessary to ensure that everyone remains alert in the entire lifecycle of a project. Before the initiation of a project, the possibility of occurrence of these risks and negative events is always outlined, and the financial implications stated. However, that does not mean every risk that is identified should occur. Vinnem (2013) observes that the expectation is always to ensure that most of the risks are avoided because their causes are already known. When one major risk is followed by another, then the financial burden may be unbearable to the department sponsoring the project. The tolerance for the loss or occurrence of negative events should have a limit. First, if these negative events keep occurring at the initial stages of the implementation, Frynas (2015) advises that the best decision is to halt the programme and conduct further analysis why they keep occurring before continuing with the activities. In case these undesirable events start to occur when the project is nearing its completion, it may force the team to continue with the activities, but a thorough investigation should be conducted on how to manage these risks to avoid further loss. There should be a clear guideline that states how much of a risk a project can withstand.

The primary data analysis shows that the existence of a process for risk identification, assessment, and prioritisation (with a Cronbach’s alpha of .972) is necessary for enhancing project success. The process should start with identifying the risks and doing the assessment.

Then the next stage is the prioritisation. As discussed above, prioritisation of risks is critical in knowing what should be done and when. The factor is closely related to the need to have a process for identification and monitoring key risk indicators, which has a Cronbach's alpha of .972 based on the primary data analysis. The risk indicators will act as warning signs about the risks that should be given priority. The indicator will not only show the risk factor that needs to be addressed at any given time but also the consequences that they may have in case they are not managed properly.

It is also clear from the information obtained from the sampled respondents that the existence of a risk heat map and dashboard that indicates risk portfolio is also necessary for the success of public projects. On the one hand, it is necessary to avoid a single risk that has a crippling impact on the initiative. On the other hand, it is equally dangerous to take numerous risks on a single venture because their combined impact may have a similar undesirable impact. A risk heat map and dashboard show the number of risks already taken in a single project and their combined impact. The top management will know whether it will be possible to take other risks or not. The heat map acts as a warning to the management when the risk appetite is exceeding the capability to manage them. Hashemi et al. (2013) state that the heat map should not be ignored because when making decisions on new risks that should be embraced. Table 8.4 below is a summary of these factors

Research Question	*What is the significance of rating the importance of the determinants of risk governance?*
Hypothesis	H_A4: There is no significant difference in rating the importance of the determinants of risk governance
Results	The results from ANOVA indicate that: Rating of the importance of the determinants of risk governance is important in enhancing project success.

Researcher Observation	The analysis of primary data outlines the importance of rating of the determinants of risk governance based on their importance • It is important to ensure that there is a process for alignment of risk profile with business capital and management plans. • The analysis of data shows that the existence of financial crisis impact drives helps project managers to make informed decisions. • The respondents believe that the existence of both qualitative and quantitative risk assessment criteria is a critical success factor. It facilitates a comprehensive analysis of risk based on its source, nature, and impact. • The study shows that it is important to have a control framework calibrated in line with the risk appetite. The framework will facilitate decision-making process by indicating risks that can be taken based on the degree of their impact. • It is necessary to have a quantified guideline for tolerance of loss and negative events. The management should have a limit beyond which risks and negative events in a given project cannot be tolerated in a single public project. • The primary data also emphasises the need to have a framework of identification, assessment, and prioritisation of risks. The framework will ensure that the assessment of risks is done in a standardised manner. • An effective internal communication system is another factor that the respondents believe may influence the success rate of a project. Junior employees should find it easy to communicate with the top managers and vice versa. • Having a risk heat map and dashboard was also noted to be an important determinant of programme success. The map helps in examining the risk portfolio and the ability to embrace other risks in a single project. • The capacity of a project to embrace risks may vary depending on varying external factors. It is important to have a mechanism for determining the current capacity before taking new risks.

Conclusion	The alternative hypotheses H_A4 *($p>0.05$) there* is no enough evidence to reject for these factors (S3, S9, RAI5, RAI9, RAI10, RMG15, RMG16, RC6, RC10, RA1, RA3).

Table 8.4: Significance of Rating the Importance of the Determinants

8.8 Summary

This chapter provides a comprehensive discussion of risk governance determinants that can enhance the success of public projects. Thirteen factors have been discussed in this section. They include strategy, risk appraisal and insight, risk decision and process implementation, risk management and governance, review risk development and decision, risk communication, and risk culture. Others include financial and technical capacity, risk appetite, ownership, project success, the occurrence of negative events, and internal audit function. Each of the 13 items is critical, but internal auditing comes out as one of the most critical functions when managing risks. Internal auditing in public investments involves a number of activities. First, it ensures that resources assigned to the projects are used effectively and for specific reasons. Cases of misuse of resources should be identified as soon as possible and corrective measures taken. Theft of these resources should be reported and punitive actions taken against those found culpable. The second area of auditing involves evaluating the capabilities of the teams assigned to undertake various tasks. Their skills and experience should be in line with the expectations. Any gap between the required skills and employees' capabilities should be addressed. Internal auditing should also involve making frequent reports about the progress and milestones in the project. Of interest will be to determine whether the progress made is in line with the expectations set in the plan. If any activity is running behind schedule, internal auditors should be able to explain root causes behind such delays.

Chapter 9: Conclusion

9.1 Introduction

The purpose of this chapter is to summarize the principal findings of this research, which derived from the elaboration on four primary research objectives. Along with the discussion of these objectives, methodology used to conduct the study will also be observed. Further, the chapter will dwell upon the most critical implications, which could be retrieved from the research for practical use, and the study's contribution to the knowledge. Finally, the chapter will discuss several relevant aspects that can be considered as potential research opportunities.

9.2 Accomplishment of research objectives

9.2.1 Objective 1: To review the existing risk governance frameworks and develop/adopt relevant risk governance framework for Dubai public sector context

The circumstances, in which contemporary governments operate, impose a diverse range of intensified risks, which are to be detected, evaluated, and managed (van Asselt & Renn 2011). Various stakeholders in the public sector are responsible for the implementation of efficient risk regulation management programs since the complexity of contemporary social issues increases the uncertainty. According to Frynas (2015), economist Frank Knight is among the first notable contributors for the development of such frameworks. Also, as it is stated by Rausand (2013), Markowitz, another risk governance theorist, suggested that risk assessment and interpretation are based on the subjective decision-making of stakeholders. Additionally, there are other definitions of risk: some researchers consider risk to be an identifiable event with adverse consequences, while others argue that risk comprises the possibility of the adverse event and the projected losses caused by such event (Burtonshaw-Gunn 2016). Considering risk assessment models, it is possible to mention Enterprise Risk Management Model, which aims to identify risks, causes, and controls, predict the magnitude of consequences, set ratings for measuring each risk, make decisions to avoid risks, and, finally, to continuously monitor situation. Among the risk governance frameworks, the following approaches were identified: Brown and Osborn's framework, the IRGC's framework, the Modified IRGC framework, the OCC's Risk Governance framework, IPCC Risk Governance model, and several others. On the larger scale, the review of these approaches revealed four key issues that define the necessity for the development of a new risk governance framework (Agola & Hunter 2016). Therefore, this research, based on the identified gaps in literature and practice, proposed a control conceptual framework, which connects ten primary determinants of risk governance practices with project outcomes.

In accomplishing this objective, this research confirms the following conclusion: there is a wide diversity of existing risk governance frameworks; however, the literature review on the topic revealed a considerable need for the development of an approach which would be specific to the context of the Dubai sector. It is evident from the research that risk is the concept that has a significantly broad variety of definitions. Thus, this study focuses on risk governance, an approach to measuring and determining risks based on such characteristics as high-level complexity, uncertainty, and ambiguity. While exploring theoretical and practical insights on the topic, the author has identified four distinguishing areas of concern derived from gaps in the existing literature. First of all, it is apparent that implementing projects in the public sector is associated with the involvement of various stakeholders. It is a particularly important aspect of the implementation of risk management processes in the Dubai public sector. Secondly, it is essential to identify the appropriate risk appetite threshold which could be established by the organizations in the Dubai public sector in order to be profitable and not to experience dismal surprises. The third issue derived from the literature review is the necessity for meaningful and efficient risk communication and reporting among various stakeholders involved in public projects. Finally, the development of positive risk culture in the organizations is considered to be another important area of concern for the Dubai public sector. It is essential to create a measuring system for the evaluation of corporate risk culture and to implement a set of leadership interventions benefitting the development of this culture. Based on the findings from the literature review, a Dubai-specific public-sector risk management model is developed.

9.2.2 Objective 2: To review and extract the most risk governance determinants

The diversity of variables among risk governance determinants is immense; however, for the purposes of this research ten principal clusters were identified. They include the following: strategy (S), risk appraisal and insight (RAI), risk management and governance (RMG), review risk development and decision (RRD), risk communication (RC), risk culture (RCU), risk appetite (RA), financial and technical capacity (F) and Ownership (O). Each of these clusters has a distinct set of variables, which was analysed previously. Strategies are one of the most principal factors of efficient risk regulation, particularly the change management strategy (Abed 2014). Risk appraisal and insight is also a very important factor because its implementation allows to correctly define which actions are to be taken. Review risk development and decision as well as risk management and governance clusters define the principles of cohesive management work, which is considerably important when responding to risk (Popov, Lyon, & Hollcroft 2016). Risk communication is considered to be another principal factor since it is of immense importance to appropriately address the issues related to risk situations (Bai 2014). Risk culture factor is dedicated to the development of risk-awareness circumstances in the organizations. Risk appetite factor is associated with the efficient assessment of the profitability of the risks, which are to be taken. The ownership of the risks is also important factor of risk governance framework under discussion.

In accomplishing this objective, this research confirms the following conclusion: due to the considerable complexity and uncertainty imposed by managing large projects in the public sector, the most critical determinants of risk governance are reviewed, identified, and structured in this study. The author confirms that the investigation of the existing literature on the topic has revealed a significantly extensive amount of measures for determining risks. Additionally, while developing the final structure of risk determinants for this research, the author considered the necessity for the implementation of such determinants, which would be suitable for the Dubai public sector organizations. Also, it is essential to mention factors, which have an adverse impact on the implementation of the public projects: scheduled delays, cost overrun, governance model failures, the insufficient reporting to major stakeholders (including board and executives), the lack of control over the implementation of project phases, unresolved issues, which exist within the company, as well as the lack of external monitoring. The complexity of these factors can result in the company's failure to achieve its business goals. Based on the necessities and demands identified previously, the author has determined ten principal areas of concern for the successful implementation of public projects in the Dubai public sector. Since the rating of risk governance determinants is highly significant for the clear understanding of risk management objectives, the author has developed a system of correlating determinants. The existing combination of qualitative and quantitative risk assessment criteria imposes a considerable demand for the ranking of these factors in accordance with their contribution to the project implementation. Also, the creation of such system has imposed the necessity for conducting a survey among key stakeholders in the Dubai public sector.

9.2.3 Objective 3: To seek opinion of Auditors and Risk Managers on the importance of the extracted risk governance determinants

After the conducted literature review, which revealed the necessity for the development/adoption of a new risk governance auditing framework due to four considerable gaps in the existing literature, and the identification of ten principal determinants of risk governance, it is essential to observe the validation and reliability analyses of the instrument used in this research. The primary aim of the research is to analyse the correlation between the efficient risk governance and the overall success of public projects in Dubai. Therefore, to achieve this goal, a questionnaire was developed in order to gather information from auditors and risk managers. The implementation of such survey is critical for the research because it allows to retrieve actual information from the stakeholders. Later, this information will be vital for the discussion of research implications.

The questionnaire comprises five sections, and the first one is divided into ten sub-questions, each representing the particular risk governance factor discussed in the previous section. The sample of the survey comprises nearly 500 participants, who were contacted by various means of communication, including e-mail, social media, and risk management forums. The survey distribution aimed to cover the maximum possible range of Dubai public sector stakeholders in order to capture the diverse picture of government organizations' readiness in terms of risk governance. The survey was conducted in the period of two months. The overall response rate is 22.6%. Further, a database was generated in SPSS software to synthesize the findings from the participants' answers. The internal consistency of the answers was analysed with the use of Cronbach's alpha, which is a robust method of measuring scale reliability (Eisinga, Grotenhuis & Pelzer 2013). Generally, Cronbach's alpha should be higher than 0.8 in order to prove the scale's reliability. The majority of Cronbach's alpha indices of the conducted study were above 0.9, with risk-based audit and project success factor's highest value of 0.986. The principal finding of this survey is that all determinants of risk governance were practiced in the majority of organizations to some extent. Another considerable finding is that the significant part of the respondents was unaware of some essential risk governance practices, and thus they could not identify with certainty if these methods are used in their organizations.

In accomplishing this objective, this research confirms the following conclusion: due to the identified necessity for the clear understanding of the Dubai public sector key stakeholders' opinion, a questionnaire was developed in order to conduct a survey. The author decided to use Cronbach's alpha since it is the most suitable method for determining the relations in coded groups. The primary objective of using Cronbach's alpha was not to investigate the dimensionality of the data, but instead to explore similar coefficient scales, which could only be determined by the use of this method. After the survey was completed, the author analysed the data retrieved from the respondents. It is evident from the results of the survey that nearly every variable included in the questionnaire is within the acceptable limits, complying with the study's requirements. It is possible to observe that risk audit and project success appear to the variable with the highest index of Cronbach alpha, 0.986. This result implies that these variables have the largest internal consistency among other determinants. The second highest Cronbach alpha is 0.987, referring to the risk appetite variable. It is possible to state that these three factors, having the highest internal consistency among others, could be indicated as the most important areas of concern for the Dubai public sector stakeholders. The lowest Cronbach alpha (0.834) is determining the internal audit function. This fact can be interpreted the following way: the participants of the survey has shown insufficient understanding of the role of risk governance instruments in their organizations. In overall, it should be stated that the conducted survey appears to be considerably unique since it allows to retrieve meaningful insights from the principal stakeholders in the Dubai public sector.

9.3 Implications

Further, it is essential to discuss the implications of the conducted research. Given the considerably diverse area, which was studied in this research, it is possible to define several implications for different stakeholders. First of all, the study imposes significant implications for policymakers on the government level in Dubai public sector. It is evident from the research that the current state of society and its continuous development has an immense impact of the evolution of risk factors. Therefore, it is essential for the government to implement systematic changes, which would result in better risk assessment and regulation processes. The second principal area for the implications is the management of organizations on every level. It is apparent from the studied literature that project teams, which primarily consist of managers with various responsibilities, are profoundly dependent on the risk assessment (Nguyen, Bhagavatulya & Jacobs 2017). The project success is one of the key measures of risk governance framework, which was proposed in this research, and thus it is essential for managers to implement the appropriate strategies for risk prevention and regulation. Another principal practical implication is that the proper employment of ten risk governance determinants has a direct positive impact on the overall success of the project.

9.4 Contribution to the knowledge

The purpose of this section is to justify and elaborate on the relevance of the study to the contemporary state of knowledge on the topic. It could be suggested that the risk governance field of study is a very dynamic area of scientific and practical concern, which is in the continuous process of renewing and adding information on the topic. In this context, one of the study's primary contributions to the knowledge is that it is one of the very few known studies that focus on the analysis of the opinions of Dubai public sector's principal stakeholders. The researcher employs information which was obtained directly from Dubai's policymakers, managers, auditors, and employees from the company of the Dubai public sector. Secondly, this study performs the reliability analysis, which is based on the respondents' information obtained from their questionnaire answers. Therefore, the researcher contributes to the knowledge by employing the method of Cronbach alpha for the analysis of very recent information from the stakeholders of the Dubai public sector.

Another contribution that could be mentioned is that the study provides an opportunity to assess the overall development of the society and economy of Dubai from a different perspective. The researched proves that risks and uncertainties related to the project implementation evolve over time, and thus it is essential to review the standards of risk governance continuously, and the study serves this function. Finally, the significance of the development of the risk governance conceptual framework could not be omitted. As the whole research is based on this method, and substantial and reliable results are obtained by the use of it, the conceptual framework developed by the researcher find further use in the analysis of risk governance and internal audit function's relationship with the success of different projects. In conclusion, this section exemplifies several solid aspects that prove the significance of the study's contribution to the current knowledge.

9.5 Limitation and Future Research

Finally, it is essential to acknowledge the study's limitations, and also to discuss the perspectives for further research on the topic. It is evident that the primary limitation of this study is its narrow focus on Dubai public sector. It is apparent that this focus is justified by the primary objective of the study; however, the findings from this research are useful for the implementation in other circumstances only to a limited extent. Despite covering a very vast and diverse area of concern, it was not possible to retrieve universal guidelines from this study.

Also, the overall methodology chosen for carrying out the research could be considered as its limitation. The methodology of this study is based on quantitative research designs, since the respondents provide answers in accordance with a concisely developed questionnaire that are further quantified and analysed, but the answers themselves could be biased by personal attitudes of a particular respondent. Accordingly, the results of the study could also be biased due to this fact. Additionally, the research is significantly limited by the sample size, which is sufficient for retrieving meaningful results, but it is still too small to make large-scale conclusions. From the initial 500 respondents that were invited to participate in the study, only 113 respondents fully completed the questionnaire. This fact is partially explained by the specific nature of the survey and confidentiality factor, which influences even larger studies, but it still limits the results of the study to a significant extent.

Another principal limitation is the implementation of the survey. Its results are robust enough to provide a considerable support for the proposed hypotheses, but the response rate is desired to be higher. In addition, it should be mentioned that the structure of the survey itself could be a limiting factor. As it was mentioned previously, the approximate time for the completion of the survey is 25 minutes, which might be perceived as too long by the majority of participants.

Therefore, it is possible to recommend the following: first of all, future research should investigate the Dubai public sector in a wider context (for example, in comparison with other public sectors of the region). The employment of this recommendation would help to extend the practical potential of further research for the Dubai public sector as well for other countries.

Secondly, it is recommended that future surveys, if they are to be conducted, would increase the response rate by promoting the participation in the survey. This aspect is of critical importance because the limited sample size is the primary limitation of this study, which does not allow retrieving large-scale information about the Dubai public sector and its principal stakeholders' opinions. It is possible to use the experience of other researchers who were able to encourage a highly sufficient number of people to participate in the survey. Additionally, the inclusion of more objective data in addition to conducting surveys would help to extend the feasibility of research.

9.6 Summary

This chapter synthesized the conclusions from four principal areas of this research. Through literature review, survey design and implementation, and further interpretation of the findings, each of four proposed research hypotheses has been proved to be correct. The study employed diverse research methodology, which included literature review and quantitative data investigation. Implications for practice along with the limitations of the study and recommendation for further research were also provided by the author.

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Appendix A:

Questionnaire Cover Letter

Dear Participant,

Risk governance and risk management allow businesses to identify strengths, limitations, threats, and opportunities of their current and future projects. Examining how risk governance can influence project outcomes and success is a useful task that could potentially strengthen the competitive advantage and ensure that a company reaches the objectives it has set earlier. Thus, the primary aim of the research is to critically investigate the correlation between effective risk Governance and the overall success of public projects in the Dubai.

In particular, your input can help us find influence of the Risk Governance on the success of the project and achieving their objectives and outcomes. We estimate that it will take you approximately 20-25 minutes to complete the survey.

All individual responses will remain confidential and study data will be integrated and analysed as a whole. The research outcome will be reported in a summary form to protect confidentiality.

However, if you have any concerns or questions about the questionnaire or about participating in this research, you can reach me via e-mail at 120003@student.buid.ac.ae.

Alternatively, you may communicate with The Director of Studies, Professor H. Boussabaine through phone at 04 279 1437 or via e-mail at halim@buid.ac.ae.

Thank you for your time and support and I look forward to sharing the results of this survey with all of those who participated.

Yours faithfully

Alia Marjan

PhD Candidate

British university in Dubai

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The research directed by:

Professor H. Boussabaine

British University in Dubai

Tel: 04 279 1437

The Questionnaire

PART 1: The Determinants of risk Governance Framework

1.0 strategy

Please rate how likely the following risk strategy processes exist in your organization:

Strategy	Very unlikely	unlikely	neutral	likely	Very likely
1.1 existence of process to align risks with strategic objectives					
1.2 existence of identification process of potential risk					
1.3 existence of process for alignment of risk profile with business and capital management plans					
1.4 existence of procedure for integrating the risk management into strategic decision making					
1.5 existence of risk management oversight body					
1.6 existence of mechanism for understanding and enforcement of risk practices by board					
1.7 existence of process for compliance with regulatory requirements					
1.8 existence of internal audit process to implement formal risk management program					
1.9 existence of financial crisis impact drives to implement risk management program					

2.0 Risk appraisal and insight

Please rate how likely the following risk appraisal and insight processes exist in your organization.

Risk appraisal and insight	Very unlikely	unlikely	neutral	likely	Very likely
2.1 existence of risk identification mechanism					
2.2 existence of mechanism for risk depository including vocabulary for risk types					
2.3 existence of qualitative risk assessment criteria					
2.4 existence of quantitative risk assessment criteria					
2.5 existence of mix qualitative and quantitate risk assessment criteria					
2.6 existence of mechanism for frequent updating the risk assessment					
2.7 existence of process for regular quantification and aggregation of risks					
2.8 existence of guidelines for prioritization of risk management and control					
2.9 existence of control framework calibrated in line with risk appetite					
2.10 existence of guidelines for quantified of tolerance for loss or negative events					

3.0 Risk decision and process implementation

Please rate how likely the following risk decision and process implementation exist processes in your organization.

Risk decision and process implementation	Very unlikely	unlikely	neutral	likely	Very likely
3.1 existence of procedure for grounding of risk in all business decision					
3.2 existence of mechanism for embedding risk optimization in strategic decision					
3.3 existence of procedure for executing core business processes and operations based on risk consideration					
3.4 existence of simple risk model as support business too for decision					

4.0 Risk Management and Governance

Please rate how likely the following risk management and governance processes exist in your organization.

Risk Management and Governance	Very unlikely	unlikely	neutral	likely	Very likely
4.1 existence of risk management policies and procedures					
4.2 existence of support and sponsorship of the risk management by the board and executive					
4.3 existence of regulatory requirements to adopt risk management practices					
4.4 existence of Chief Risk Officer position					
4.5 existence of formalized approach to addressing risks					
4.6 existence of guidelines for definition of role and responsibilities of risk staff					
4.7 existence of risk communication mechanism					
4.8 existence of whistleblowing mechanism					
4.9 existence of ethics and code of conduct policies					
4.10 existence of guidelines for risk internal control					
4.11 existence of guidelines for definition of risk accountability and ownership					
4.12 existence of guidelines for internal audit as assurance task					
4.13 existence of risk function					
4.14 existence of risk treatment plans and response strategies					
4.15 existence of process for risk identification, assessment and prioritization					
4.16 existence of process for identification and monitoring key risk indicators					
4.17 existence of regular risk communication by board and senior management					
4.18 existence of formal risk oversight authority					
4.19 existence of procedure for fraud risk assessment					

5.0 Review risk development and decision

Please rate how likely the following review risk development and decision processes exist in your organization.

Review risk development and decision	Very unlikely	unlikely	neutral	likely	Very likely
5.1 existence of Internal Audit assurance framework for risk management					
5.2 existence of process for ongoing update of risk assessment					
5.3 existence of mechanism for independent assurance by third party					
5.4 existence of guidelines for board/audit committees oversight					
5.5 existence of process for monitoring and review of risk management framework					
5.6 existence of guidelines for revision and reconstruction of risk management					
5.7 existence of periodic reporting on risk to risk oversight authority					
5.8 existence of process for escalating and notifying the risk acceptance to the oversight authority					
5.9 existence of process for management and monitoring of risk exposures					
5.10 existence of documentation process					

6.0 Risk Communication

Please rate how likely the following risk communication processes exist in your organization.

Risk Communication	Very unlikely	unlikely	neutral	likely	Very likely
6.1 existence of process for risk communication mechanism					
6.2 existence of process to promote the Transparency					
6.3 existence of guidelines of roles for coordinating risk management activity					
6.4 existence of guidelines for appointing risk champions from business unit					
6.5 existence of risk awareness initiative					
6.6 existence of procedure for internal communication of amount and type of risk to accept and manage or avoid					
6.7 existence of process for external communication to promote transparency and accountability					

6.8 existence of guidelines for monitoring and reporting of performance against risks					
6.9 existence of risk register					
6.10existence of risk heat map and dashboard indicates risk portfolio					
6.11existence of key risk indicators report					
6.12 existence of aggregated quantitative risk exposure report					

7.0 Risk Culture

Please rate how likely the following risk culture processes exist in your organization.

Risk Culture	Very unlikely	unlikely	neutral	likely	Very likely
7.1 existence of guidelines for promotion the accountability					
7.2 existence of risk awareness program					
7.3 existence of guidelines for internal audit role to promote risk culture					
7.4 existence of guidelines for risk management training for board and staff					
7.5 existence of process for risk culture audit					
7.6 existence of program for development of talents and skills					
7.7 existence of guidelines for fostering risk understanding and conviction					
7.8 existence of formal training of fraud risk awareness and ethical culture					

8.0 Financial and technical capacity

Please rate how likely the following financial and technical capacity processes exist in your organization.

Financial and technical capacity	Very unlikely	unlikely	neutral	likely	Very likely
8.1 existence of mechanism for allocating adequate Capital to deal with risk					
8.2 existence of mechanism for acquiring skills and management capabilities					
8.3 existence of human skills					
8.4 existence of financial resources					
8.5 existence of risk technology					

9.0 Risk appetite

Please rate how likely the following risk appetite processes exist in your organization.

Risk appetite	Very unlikely	unlikely	neutral	likely	Very likely
9.1 existence of risk appetite framework					
9.2 existence of definition of risk appetite statement					
9.3 existence of mechanism for understanding the current risk capacity					
9.4 existence of periodic review of appetite limit with reference to evolving industry and market condition					
9.5 existence of frequent revision of risk appetite in line with the change of strategy					
9.6 existence of guidelines for alignment of risk appetite between board and business function					
9.7 existence of guidelines for communication of risk appetite tolerance					
9.8 existence of reporting process for any instances where the appetite and specific risk thresholds are reached					
9.9existence of process for integration or risk appetite into the performance management framework					

10.0 Ownership

Please rate how likely the risk ownership processes exist in your organization.

Ownership	Very unlikely	unlikely	neutral	likely	Very likely
10.1 existence of guidelines for risk ownership allocation					
10.2 existence of guidelines for risk accountability					
10.3 existence of risk management function					
10.4 existence of risk team to coordinate risk activities					
10.5 existence of process for internal audit to coordinate and facilitate risk management activities					
10.6 existence of risk champions in business units to coordinate risk activities					
10.7 existence of third party professional service provider for risk management activities					

PART2: The influence of Risk based audit process on success of the projects

Please rate how likely the risk-based audit processes contribute towards helping your organization to achieving projects' objectives:

Risk Governance and the success of projects	Very unlikely	unlikely	neutral	likely	Very likely
2.1 the achievement of strategy objectives					
2.2 delivering projects on time and budget					
2.3 improvement of understanding of key risks and their wider implications					
2.4 issuance of consolidated reports of disparate risk at board level					
2.5 Identification of projects' risks					
2.6 sharing the projects' risks cross the					

departmental/sections					
2.7 increasing of management focus on the key issues					
2.8 fewer surprises and crisis in projects					
2.9 more focus on efficiency of projects phases (the ability to implement the projects successfully without waste)					
2.10 more focus on effectiveness of projects phases (more focus internally on doing the right things in the right time)					
2.11Capability to take on critical risks in order to get greater reward					
2.12 reassurance of adequate evaluation of risks					
2.13 reassurance of adequate implementation of risk management processes					
2.14 better organizational redness					
2.15 Increased project control to maximize efficiency					
2.16 more informed risk-taking and decision-making					
2.17 early identification and understanding of internal and external issues pertaining to projects					
2.18 increased likely of delivering projects on scope, on time, and on budget					
2.19 ensure interdependent risks are managed					
2.20 adoption of risk based audit has enabled optimal utilization of financial resources					
2.21 risk based audit has increased the accountability					
2.22 continuously monitoring and assessing the stakeholder's expectation					
2.23 continuously reporting the key risks dashboard to board and executives					
2.14 helping board/committees to the risk oversight responsibility					
2.25 ability to identify the emerging risks associated with strategic plans					
2.26 risk based audit helps to identify the risk appetite adequately					
2.27 improved ability to execute strategic plans					
2.28 fewer operational surprises					

Part3: The impact of negative events on projects

Please rate the occurrence of the following events in your organization:

The occurrence of events	Very unlikely	unlikely	neutral	likely	Very likely
3.1 our organization is experiencing schedule delays					
3.2 our organization is experiencing cost overrun					
3.3 lack of control over the projects phases					
3.4 our organization experienced projects failure in the past					
3.5 governance model fails to manage key projects					
3.6 existence of unresolved issues and disputes					
3.7 lack of independent monitoring of progress					
3.8 lack of reporting to board and executives					
3.9 our organization is experiencing failure to achieve the business objectives					
3.10 loss of opportunity cost of doing the wrong projects					

Part 4: The Internal Audit Function in Risk management

Please rate the importance of the following audit functions/tasks in managing the risks in your organization

Audit function in overseeing risk management	Very Unimpor tant	Unimpor tant	neutral	Importan t	Very important
4.1 Provide independent assurance on risk management processes.					
4.2 Acts as catalyst in establishing a formal risk management program.					
4.3 Actively participate /facilitate in implementing risk management program.					
4.4 Provide consulting and advice on risk management practices.					
4.5 Internal Audit should not intervene in risk management process					
4.6 Provides assurance through written reports covering how key risks are managed					
4.7 Provides assurance through written audit reports over the entity-wide risk management process					
4.8 review the organization's risk appetite					
4.9 provide assurance on the organizational policies for its risk management processes					
4.10 Provide assurance on risk management strategy					
4.11 Review the implementation of risk response on management's behalf					

1. PART 5: General Information

2.

3. Please provide the required details through marking a tick next to the answer of your choice

1. Job level

☐ Employee ☐ Middle Management ☐ Top Management

2. No. of total work experience

☐ 0 – 2 ☐ 3 – 5 ☐ 6 - 10 ☐ 11- 19 ☐ 20 or above

3. Educational level

☐ High school graduate or Less ☐ College degree

☐ Higher Diploma/Bachelor degree ☐ Masters ☐ Doctorate or above

4. Age

☐ Less than 24 ☐ 25 - 30 ☐ 31 - 40 ☐ 41 – 50 ☐ 50 or above

5. Gender

☐ Male ☐ Female

6. Nationality

☐ UAE National ☐ Non UAE National

- End of Questionnaire -

Thank you for successfully completing this questionnaire.

Appendix B: ANOVA Analysis

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
S1	Between Groups	.253	2	.127	.089	.915
	Within Groups	158.168	111	1.425		
	Total	158.421	113			
S2	Between Groups	2.449	2	1.225	.985	.377
	Within Groups	138.016	111	1.243		
	Total	140.465	113			
S3	Between Groups	1.142	2	.571	.454	.636
	Within Groups	139.489	111	1.257		
	Total	140.632	113			
S4	Between Groups	.910	2	.455	.346	.708
	Within Groups	145.871	111	1.314		
	Total	146.781	113			
S5	Between Groups	7.729	2	3.864	2.668	.074
	Within Groups	160.797	111	1.449		

	Total	168.526	113			
S6	Between Groups	.110	2	.055	.040	.961
	Within Groups	152.144	111	1.371		
	Total	152.254	113			
S7	Between Groups	3.723	2	1.861	1.374	.257
	Within Groups	150.347	111	1.354		
	Total	154.070	113			
S8	Between Groups	.401	2	.201	.131	.877
	Within Groups	170.064	111	1.532		
	Total	170.465	113			
S9	Between Groups	.052	2	.026	.018	.982
	Within Groups	158.580	111	1.429		
	Total	158.632	113			

Table 1: Strategy

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
RAI1	Between Groups	.945	2	.472	.342	.711
	Within Groups	153.336	111	1.381		

	Total	154.281	113			
RAI2	Between Groups	.716	2	.358	.262	.770
	Within Groups	151.810	111	1.368		
	Total	152.526	113			
RAI3	Between Groups	.703	2	.351	.275	.760
	Within Groups	141.762	111	1.277		
	Total	142.465	113			
RAI4	Between Groups	.227	2	.113	.079	.924
	Within Groups	159.738	111	1.439		
	Total	159.965	113			
RAI5	Between Groups	1.297	2	.649	.501	.607
	Within Groups	143.720	111	1.295		
	Total	145.018	113			
RAI6	Between Groups	.418	2	.209	.164	.849
	Within Groups	141.862	111	1.278		
	Total	142.281	113			
RAI7	Between Groups	.661	2	.330	.224	.800
	Within Groups	163.594	111	1.474		
	Total	164.254	113			

RAI8	Between Groups	.981	2	.490	.342	.711
	Within Groups	159.379	111	1.436		
	Total	160.360	113			
RAI9	Between Groups	1.770	2	.885	.720	.489
	Within Groups	136.484	111	1.230		
	Total	138.254	113			
RAI10	Between Groups	.039	2	.019	.015	.985
	Within Groups	145.479	111	1.311		
	Total	145.518	113			

Table 2: Risk appraisal and insight

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
RD1	Between Groups	.793	2	.397	.297	.744
	Within Groups	148.225	111	1.335		
	Total	149.018	113			
RD2	Between Groups	.662	2	.331	.242	.786
	Within Groups	151.908	111	1.369		
	Total	152.570	113			

RD3	Between Groups	.571	2	.285	.203	.817
	Within Groups	155.999	111	1.405		
	Total	156.570	113			
RD4	Between Groups	.276	2	.138	.117	.890
	Within Groups	131.346	111	1.183		
	Total	131.623	113			

Table 3: Risk decision and process implementation

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
RMG1	Between Groups	2.704	2	1.352	.993	.374
	Within Groups	151.155	111	1.362		
	Total	153.860	113			
RMG2	Between Groups	.175	2	.087	.070	.933
	Within Groups	139.062	111	1.253		
	Total	139.237	113			
RMG3	Between Groups	.546	2	.273	.171	.843
	Within Groups	177.559	111	1.600		
	Total	178.105	113			

RMG4	Between Groups	1.400	2	.700	.385	.681
	Within Groups	201.521	111	1.816		
	Total	202.921	113			
RMG5	Between Groups	.102	2	.051	.036	.965
	Within Groups	157.521	111	1.419		
	Total	157.623	113			
RMG6	Between Groups	.308	2	.154	.107	.899
	Within Groups	159.946	111	1.441		
	Total	160.254	113			
RMG7	Between Groups	.068	2	.034	.024	.977
	Within Groups	158.292	111	1.426		
	Total	158.360	113			
RMG8	Between Groups	.312	2	.156	.097	.908
	Within Groups	178.469	111	1.608		
	Total	178.781	113			
RMG9	Between Groups	3.437	2	1.719	1.394	.252
	Within Groups	136.817	111	1.233		
	Total	140.254	113			

RMG10	Between Groups	.114	2	.057	.045	.956
	Within Groups	139.825	111	1.260		
	Total	139.939	113			
RMG11	Between Groups	.126	2	.063	.046	.956
	Within Groups	153.208	111	1.380		
	Total	153.333	113			
RMG12	Between Groups	2.306	2	1.153	1.030	.361
	Within Groups	124.299	111	1.120		
	Total	126.605	113			
RMG13	Between Groups	.638	2	.319	.219	.804
	Within Groups	161.862	111	1.458		
	Total	162.500	113			
RMG14	Between Groups	.989	2	.494	.340	.713
	Within Groups	161.511	111	1.455		
	Total	162.500	113			
RMG15	Between Groups	.422	2	.211	.149	.862
	Within Groups	157.368	111	1.418		
	Total	157.789	113			

RMG16	Between Groups	1.156	2	.578	.419	.659
	Within Groups	153.265	111	1.381		
	Total	154.421	113			
RMG17	Between Groups	.148	2	.074	.052	.950
	Within Groups	158.870	111	1.431		
	Total	159.018	113			
RMG18	Between Groups	.615	2	.308	.239	.788
	Within Groups	142.902	111	1.287		
	Total	143.518	113			
RMG19	Between Groups	.828	2	.414	.310	.734
	Within Groups	148.199	111	1.335		
	Total	149.026	113			

Table 4: Risk management and governance

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
RRD1	Between Groups	.006	2	.003	.002	.998
	Within Groups	157.932	111	1.423		
	Total	157.939	113			
RRD2	Between Groups	.314	2	.157	.121	.886
	Within Groups	143.476	111	1.293		
	Total	143.789	113			
RRD3	Between Groups	.967	2	.483	.338	.714
	Within Groups	158.656	111	1.429		
	Total	159.623	113			
RRD4	Between Groups	.349	2	.175	.122	.885
	Within Groups	158.221	111	1.425		
	Total	158.570	113			
RRD5	Between Groups	4.144	2	2.072	1.438	.242
	Within Groups	159.961	111	1.441		
	Total	164.105	113			
RRD6	Between Groups	6.264	2	3.132	2.284	.107

	Within Groups	152.201	111	1.371		
	Total	158.465	113			
RRD7	Between Groups	1.455	2	.728	.528	.592
	Within Groups	153.115	111	1.379		
	Total	154.570	113			
RRD8	Between Groups	.618	2	.309	.251	.779
	Within Groups	136.899	111	1.233		
	Total	137.518	113			
RRD9	Between Groups	.696	2	.348	.270	.764
	Within Groups	143.093	111	1.289		
	Total	143.789	113			
RRD10	Between Groups	.571	2	.286	.250	.780
	Within Groups	127.052	111	1.145		
	Total	127.623	113			

Table 5: Risk development and decision

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
RC1	Between Groups	.276	2	.138	.091	.913
	Within Groups	168.294	111	1.516		
	Total	168.570	113			
RC2	Between Groups	1.552	2	.776	.590	.556
	Within Groups	146.071	111	1.316		
	Total	147.623	113			
RC3	Between Groups	2.785	2	1.392	1.034	.359
	Within Groups	149.470	111	1.347		
	Total	152.254	113			
RC4	Between Groups	.532	2	.266	.172	.842
	Within Groups	171.573	111	1.546		
	Total	172.105	113			
RC5	Between Groups	1.207	2	.604	.392	.677
	Within Groups	170.977	111	1.540		
	Total	172.184	113			
RC6	Between Groups	.167	2	.083	.061	.941

	Within Groups	150.956	111	1.360		
	Total	151.123	113			
RC7	Between Groups	5.651	2	2.826	2.094	.128
	Within Groups	149.787	111	1.349		
	Total	155.439	113			
RC8	Between Groups	2.304	2	1.152	.788	.457
	Within Groups	162.301	111	1.462		
	Total	164.605	113			
RC9	Between Groups	7.173	2	3.586	2.224	.113
	Within Groups	179.012	111	1.613		
	Total	186.184	113			
RC10	Between Groups	3.836	2	1.918	1.281	.282
	Within Groups	166.234	111	1.498		
	Total	170.070	113			
RC11	Between Groups	1.777	2	.888	.590	.556
	Within Groups	167.241	111	1.507		
	Total	169.018	113			
RC12	Between Groups	.437	2	.218	.152	.859
	Within Groups	159.633	111	1.438		

Total		160.070	113			

Table 6: Risk Communication

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
RCU1	Between Groups	2.066	2	1.033	.807	.449
	Within Groups	142.040	111	1.280		
	Total	144.105	113			
RCU2	Between Groups	.859	2	.429	.311	.733
	Within Groups	153.106	111	1.379		
	Total	153.965	113			
RCU3	Between Groups	2.077	2	1.039	.767	.467
	Within Groups	150.344	111	1.354		
	Total	152.421	113			
RCU4	Between Groups	6.386	2	3.193	2.328	.102
	Within Groups	152.219	111	1.371		
	Total	158.605	113			
RCU6	Between Groups	8.504	2	4.252	3.066	.051
	Within Groups	153.960	111	1.387		
	Total	162.465	113			
RCU7	Between Groups	1.966	2	.983	.711	.494
	Within Groups	153.552	111	1.383		
	Total	155.518	113			

Table 7: Risk Culture

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
F1	Between Groups	.018	2	.009	.008	.992
	Within Groups	127.316	111	1.147		
	Total	127.333	113			
F2	Between Groups	1.550	2	.775	.652	.523
	Within Groups	131.897	111	1.188		
	Total	133.447	113			
F3	Between Groups	.062	2	.031	.026	.975
	Within Groups	132.430	111	1.193		
	Total	132.491	113			
F4	Between Groups	1.151	2	.575	.548	.580
	Within Groups	116.507	111	1.050		
	Total	117.658	113			
F5	Between Groups	.311	2	.155	.098	.907
	Within Groups	175.944	111	1.585		
	Total	176.254	113			

Table 8: Financial and Technical capacity

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
RA1	Between Groups	1.242	2	.621	.415	.661
	Within Groups	165.890	111	1.495		

	Total	167.132	113			
	Between Groups	.387	2	.194	.121	.886
RA2	Within Groups	177.972	111	1.603		
	Total	178.360	113			
	Between Groups	.033	2	.017	.011	.989
RA3	Within Groups	162.072	111	1.460		
	Total	162.105	113			
	Between Groups	.476	2	.238	.168	.846
RA4	Within Groups	157.462	111	1.419		
	Total	157.939	113			
	Between Groups	1.039	2	.520	.383	.682
RA5	Within Groups	150.478	111	1.356		
	Total	151.518	113			
	Between Groups	2.246	2	1.123	.822	.442
RA6	Within Groups	151.692	111	1.367		
	Total	153.939	113			
	Between Groups	.085	2	.042	.031	.969
RA7	Within Groups	149.670	111	1.348		
	Total	149.754	113			
	Between Groups	.040	2	.020	.014	.986
RA8	Within Groups	153.118	111	1.379		
	Total	153.158	113			
	Between Groups	1.734	2	.867	.651	.523
RA9	Within Groups	147.783	111	1.331		
	Total	149.518	113			

Table 9: Risk Appetite

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
O1	Between Groups	1.176	2	.588	.476	.622
	Within Groups	137.079	111	1.235		
	Total	138.254	113			
O2	Between Groups	.503	2	.252	.205	.815
	Within Groups	136.488	111	1.230		
	Total	136.991	113			
O3	Between Groups	.197	2	.098	.067	.935
	Within Groups	163.040	111	1.469		
	Total	163.237	113			
O4	Between Groups	.134	2	.067	.048	.953
	Within Groups	156.120	111	1.406		
	Total	156.254	113			
O5	Between Groups	.116	2	.058	.043	.958
	Within Groups	150.138	111	1.353		
	Total	150.254	113			
O6	Between Groups	1.188	2	.594	.400	.671
	Within Groups	164.672	111	1.484		
	Total	165.860	113			

Table 10: Ownership

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
RG3	Between Groups	.497	2	.249	.255	.775
	Within Groups	108.073	111	.974		
	Total	108.570	113			
RG4	Between Groups	2.928	2	1.464	1.173	.313
	Within Groups	138.510	111	1.248		
	Total	141.439	113			
RG5	Between Groups	2.618	2	1.309	1.366	.259
	Within Groups	106.330	111	.958		
	Total	108.947	113			
RG6	Between Groups	.533	2	.266	.224	.800
	Within Groups	131.932	111	1.189		
	Total	132.465	113			
RG7	Between Groups	1.640	2	.820	.881	.417
	Within Groups	103.308	111	.931		
	Total	104.947	113			
RG10	Between Groups	2.798	2	1.399	1.678	.191
	Within Groups	92.535	111	.834		
	Total	95.333	113			
RG11	Between Groups	3.679	2	1.840	1.886	.156
	Within Groups	108.259	111	.975		
	Total	111.939	113			
RG12	Between Groups	4.874	2	2.437	2.442	.092

	Within Groups	110.784	111	.998		
	Total	115.658	113			
RG13	Between Groups	5.425	2	2.712	2.826	.064
	Within Groups	106.540	111	.960		
	Total	111.965	113			
RG15	Between Groups	2.481	2	1.241	1.513	.225
	Within Groups	91.036	111	.820		
	Total	93.518	113			
RG16	Between Groups	3.073	2	1.537	1.631	.200
	Within Groups	104.585	111	.942		
	Total	107.658	113			
RG17	Between Groups	2.066	2	1.033	1.146	.322
	Within Groups	100.040	111	.901		
	Total	102.105	113			
RG18	Between Groups	4.987	2	2.493	2.825	.064
	Within Groups	97.960	111	.883		
	Total	102.947	113			
RG19	Between Groups	1.820	2	.910	.837	.436
	Within Groups	120.706	111	1.087		
	Total	122.526	113			
RG20	Between Groups	4.181	2	2.090	2.222	.113
	Within Groups	104.424	111	.941		
	Total	108.605	113			
RG21	Between Groups	4.796	2	2.398	2.926	.058
	Within Groups	90.958	111	.819		

	Total	95.754	113			
	Between Groups	.487	2	.244	.266	.767
RG22	Within Groups	101.767	111	.917		
	Total	102.254	113			
	Between Groups	2.050	2	1.025	.908	.406
RG23	Within Groups	125.284	111	1.129		
	Total	127.333	113			
	Between Groups	1.865	2	.932	.880	.418
RG24	Within Groups	117.583	111	1.059		
	Total	119.447	113			
	Between Groups	.128	2	.064	.063	.939
RG25	Within Groups	112.889	111	1.017		
	Total	113.018	113			
	Between Groups	1.561	2	.781	.896	.411
RG26	Within Groups	96.693	111	.871		
	Total	98.254	113			
	Between Groups	.527	2	.263	.283	.754
RG27	Within Groups	103.228	111	.930		
	Total	103.754	113			
	Between Groups	.862	2	.431	.490	.614
RG28	Within Groups	97.708	111	.880		
	Total	98.570	113			

Table 11: Risk Audit and success of projects

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
IN1	Between Groups	3.463	2	1.731	1.531	.221
	Within Groups	125.555	111	1.131		
	Total	129.018	113			
IN2	Between Groups	3.294	2	1.647	1.521	.223
	Within Groups	120.145	111	1.082		
	Total	123.439	113			
IN3	Between Groups	4.804	2	2.402	1.980	.143
	Within Groups	134.635	111	1.213		
	Total	139.439	113			
IN4	Between Groups	2.844	2	1.422	1.083	.342
	Within Groups	145.787	111	1.313		
	Total	148.632	113			
IN5	Between Groups	3.751	2	1.876	1.929	.150
	Within Groups	107.933	111	.972		
	Total	111.684	113			
IN6	Between Groups	1.451	2	.725	.521	.595
	Within Groups	154.514	111	1.392		
	Total	155.965	113			
IN7	Between Groups	5.653	2	2.827	2.446	.091
	Within Groups	128.285	111	1.156		
	Total	133.939	113			

IN8	Between Groups	2.415	2	1.208	.849	.431
	Within Groups	157.874	111	1.422		
	Total	160.289	113			
IN9	Between Groups	7.153	2	3.576	2.888	.060
	Within Groups	137.479	111	1.239		
	Total	144.632	113			
IN10	Between Groups	1.511	2	.756	.574	.565
	Within Groups	146.243	111	1.318		
	Total	147.754	113			

Table 12: occurrence of negative events of projects

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
IAF2	Between Groups	1.957	2	.979	1.098	.337
	Within Groups	98.964	111	.892		
	Total	100.921	113			
IAF3	Between Groups	3.379	2	1.690	1.864	.160
	Within Groups	100.621	111	.906		
	Total	104.000	113			
IAF4	Between Groups	1.248	2	.624	.829	.439
	Within Groups	83.489	111	.752		
	Total	84.737	113			
IAF5	Between Groups	2.530	2	1.265	.875	.420
	Within Groups	160.488	111	1.446		

Total	163.018	113			

Table 13: Role of Internal Audit Function