Cape Peninsula
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A STRUCTURED APPROACH TO RISK MANAGEMENT FOR SOUTH AFRICAN SMEs

by

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DECLARATION

I, Yolandé Smit, declare that the contents of this thesis represent my own unaided work, and that the thesis has not previously been submitted for academic examination towards any qualification. Furthermore, it represents my own opinions and not necessarily those of the Cape Peninsula University of Technology.

Signed **Date**

ABSTRACT

Risk, prevalent in all organisational activities influences the achievement or non-achievement of organisational goals. This necessitates the need for a structured process for effective risk management.

Traditionally, risk management strategies were centred on insurance solutions, however due to changes in the business landscape, organisations moved towards an integrated, holistic strategy-focused risk discipline. Small and Micro Enterprise (SME) owner-managers are however largely ignorant about the risks faced by their enterprises. They still respond reactively to risk by utilising risk avoidance and risk transfer techniques. These non-structured approaches to risk impede on SME growth and success, limiting their role to providing employment, contributing to investment, and contributing to the economy as a whole.

In this research study a SME risk architecture framework that can be used concurrently with corporate governance frameworks as well as the organisation's performance measurement system is proposed resulting in a structured approach to managing SME risks. The proposed SME architecture framework consists of three interrelated components, namely:

- SME risk consciousness, focusing on risk sources most commonly identified as obstacles to SME success and survival.
- The SME risk management process that constitutes the steps SME owner-managers should follow in addressing risk sources.
- The SME risk management framework providing owner-managers with a mechanism to deal with risks at all organisational levels through effective risk planning, risk implementation and risk evaluation processes.

ACKNOWLEDGEMENTS

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- My colleagues in the Business Faculty for their support.
- My husband who showed patience and understanding through this long process.

DEDICATION

In memory of my late grandfather, Johannes Groenewald.

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CHAPTER 1
SCOPE OF THE RESEARCH

SYNOPSIS

Risk, prevalent in all organisational activities impacts directly on enterprise performance, thus necessitating the need to manage it. The importance of modern risk management, which entails a holistic approach, is widely acknowledged in all organisational spheres, however a plethora of obstacles impede on the ability of Small and Micro Enterprises (SME's) to implement enterprise risk management principles from a holistic perspective. As a result, SMEs follow an unstructured approach to risk management, which in turn impacts negatively on the risk efficiency of the SME industry. To facilitate SME business success, particularly taking into account the valued contribution of SME's to local economic development, a structured risk management model is proposed in this research study that would notably reduce the risk exposure of SMEs, thus ensuring sustainability and competitiveness.

The formulation of a structured risk management model will be based on analogies drawn from case study research where SME owner-managers in the retail sector in the Western Cape, South Africa, were selected as the unit of analysis. Questionnaires will be used to gather information from which it will be analysed using descriptive and inferential statistics.

The content of Chapter 1, along with the relative positioning of the various topics which will be addressed therein, is graphically depicted in Figure 1.

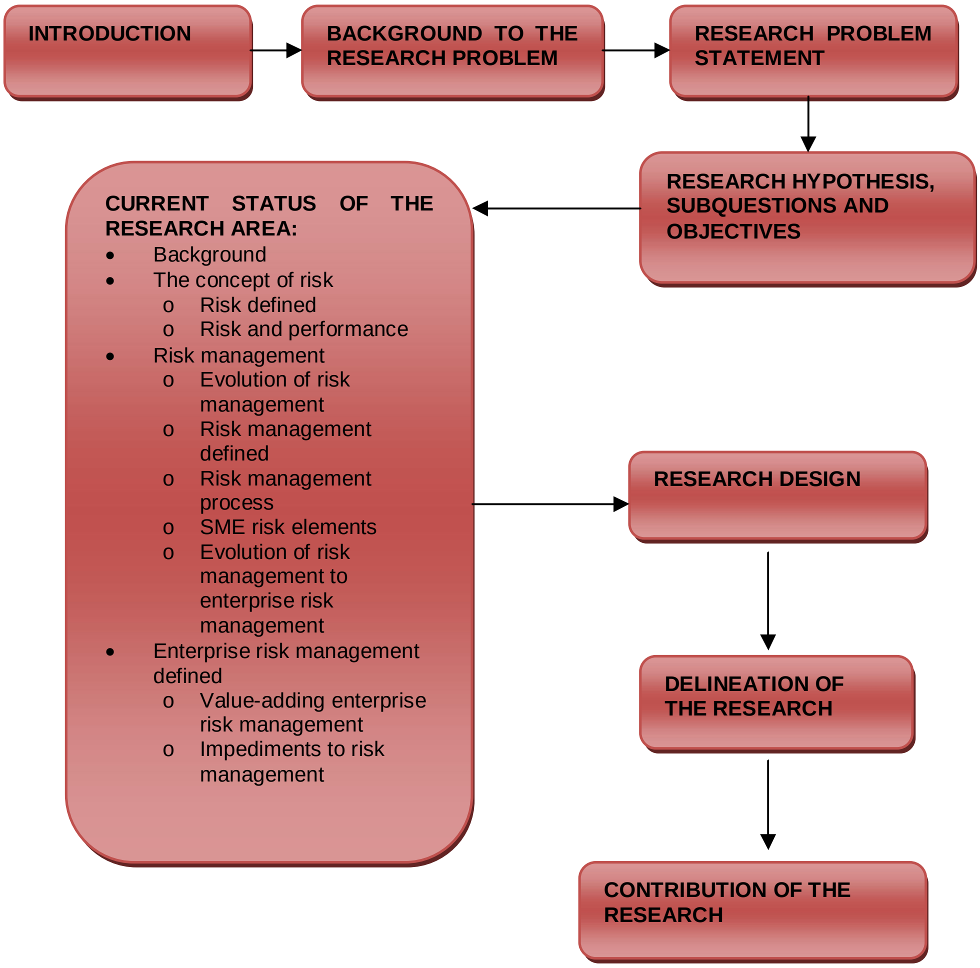

Figure 1: Detailed layout of Chapter 1 - Scope of the research.

CHAPTER ONE
SCOPE OF THE RESEARCH

1.1 INTRODUCTION

The analytical process, which will be followed within the ambit of this doctoral thesis, is graphically depicted in Figure 1.1, placing the chapters in context with the overall thesis objectives, and furthermore indicating the relative positioning of this chapter.

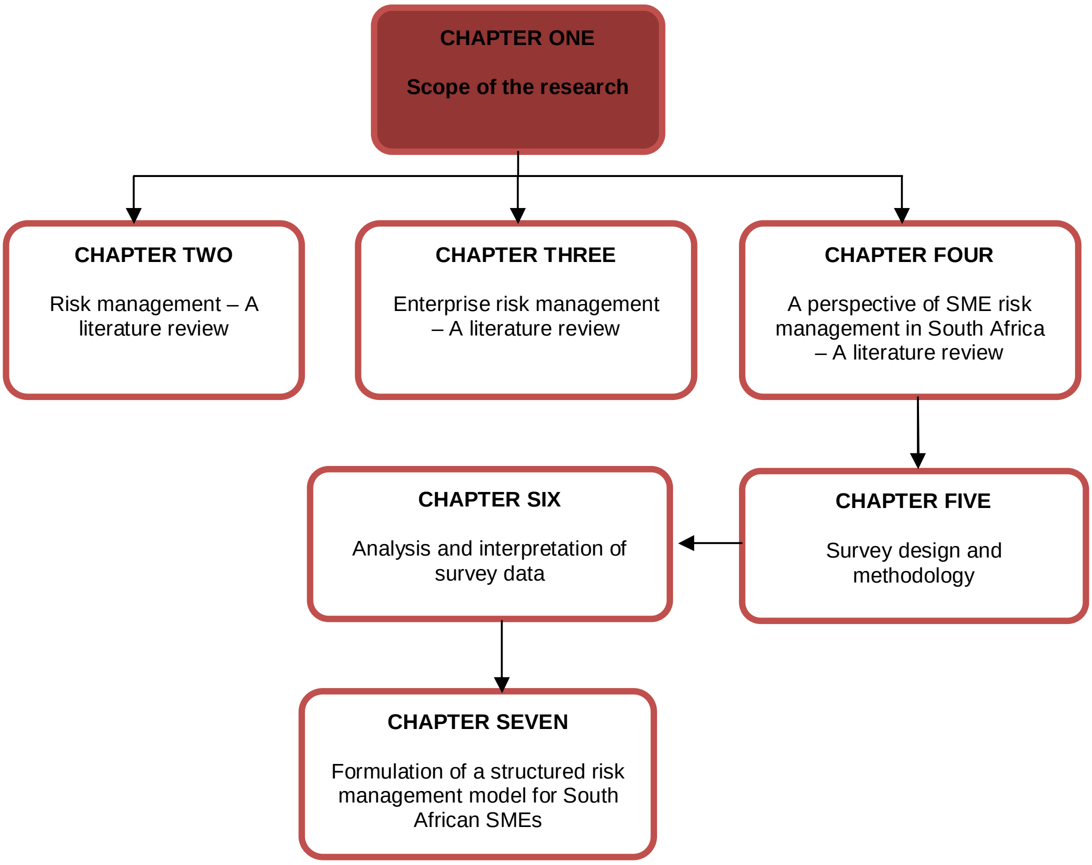

Figure 1.1: Chapter 1 - Scope of the research.

1.2 BACKGROUND TO THE RESEARCH PROBLEM

South African SME owner-managers are not knowledgeable about assessing enterprises’ risk factors impacting on their business environments. They do not actively engage in prioritising risk factors according to the risk impact and probability, resulting in inefficient control actions taken to manage these risks. The realisation of these risks may result in the occurrence of negative consequences for the affected enterprise as reflected in the high failure rate of between 70% and 80% of South African SMEs (Van Eeden *et al*., 2003[1] cited by Mutezo, 2005:37).

The SME contribution potential to the local economic development should not be trivialised, as studies have shown that SMEs, in particular in Western Europe and Japan, are a main contributor to local economic development. The same maxim should hold true of South African SMEs, however research has shown that SME policies as dictated by policy makers and the reality of South African SMEs, do not map to each other. South African SMEs are very heterogeneous and require more specific organisational related support than the generic support which are provided at present (Kesper, 2000:1). The facilitation of effective SME policy necessitates the collection and analysis of SME information to counter decision-making based on unobjective and unreliable information regarding SME characteristics (Berry, 2002:14).

The development of a flexible integrated risk management model structured to the needs of SMEs will aid the South African policy makers and SME enterprises, in the identification and management of SME risk characteristics. Such a dispensation would culminate in improved SME management, as well as in the collection and analysis of SME-specific information to aid in the creation of more effective SME policies.

1.3 RESEARCH PROBLEM STATEMENT

Against the above background the research problem to be researched within the ambit of this thesis reads as follows: ‘No structured approach to

[1] Van Eeden, S., Viviers, S. & Venter, D. 2003. A comparative study of selected problems encountered by small businesses in the Nelson Mandela, Cape Town and Egoli metropoles. *Management Dynamics*, 12(3):13-23.

risk management exists for South African SMEs in the retail trade, adversely impacting on the risk efficiency of the industry'.

1.4 RESEARCH HYPOTHESIS, SUBQUESTIONS AND OBJECTIVES

A hypothesis-generating approach first mooted by Glaser and Strauss (1967:39-40), will be used in this research study. The following research hypothesis (Collis & Hussey, 2003:231), the latter defined by Silverman (1993:1), as a 'testable proposition', is derived from the research problem:

H_0 A structured approach to risk management for South African SMEs would significantly limit their risk exposure, and improve the risk efficiency of the industry.

The investigative subquestions to be researched in support of the stated research hypothesis reads as follows:

- Does a general absence of risk management knowledge by SME owners, adversely impact on the risk efficiency of SMEs?
- To what extent can a small organisation like an SME successfully adopt a structured approach to risk management?
- How can control mechanisms for risk exposure be mapped into a structured approach to risk management, to effectively control risks of SMEs?
- Can a structured approach to risk management, which normally encompasses complex mechanisms, be formulated so as to have an effective application within SMEs in terms of simplicity and ease of application?
- How can a structured approach to risk management be effectively implemented within South African SMEs, to the benefit of the industry as a whole?

The following research objectives are set to be achieved by the results obtained from the investigative questions:

- To formulate a structured risk management model specifically aimed at reducing the risks associated with South African SMEs.

- To determine the level of risk knowledge of South African SME owner-managers.
- To determine the current use of risk management models by SME owner-managers, and the adequacy of the current risk methodology applied.
- To develop a simplistic risk management model.
- To determine the implementation viability of the proposed formulated risk management model for South African SMEs, and associated potential benefits, which can be gleaned from such an application.

1.5 CURRENT STATUS OF THE RESEARCH AREA

From a literature review perspective, the focus in this thesis will be directed at risk management structures applicable to SMEs both locally and abroad. This analysis will include a literature review of the concept of risk management from an empirical perspective within the South African SME context. To provide the reader with a holistic perspective of the research and aid in the understanding of the primary theme of the thesis, a brief overview of the status of the research area, is provided.

1.5.1 Background

The SME contribution to the South African economy, excluding medium enterprises, can roughly be estimated at 20% of the Gross Domestic Product (GDP) (Abedian *et al*., 2001[2] cited by Berry, Von Blottnitz, Cassim, Kesper, Rajaratnam & Van Seventer, 2002:28). Although medium and large enterprises dominate the South African economy based on their GDP contributions, SMEs have a pivotal role to play in generating employment and the upgrading of human capital (Berry *et al*., 2002:4).

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[2] Abedian, I., Falkena, H., Coovadia, C., Davel, G., Madungandaba, J., Masilela, E. & Rees, S. 2001. SME's Access to Finance in South Africa – A supply side regulatory review. Policy Board for Financial Services and Regulation. [Online]. www.ijr.org.za/publications/pdfs/TA_2005_complete.pdf

The Western Cape manufacturing sector is the third largest contributor to the South African manufacturing output and employment, where SMEs comprise the majority of manufacturing firms. Although these enterprises have a positive outlook on economic conditions, research has shown that increased sales amongst 65% of these organisations, did not map to significantly increased employment opportunities. This is attributable to unfavourable macroeconomic conditions, as well as internal factors such as inadequate internal operations (Kesper, 2000:13-15).

Research has furthermore shown the lack of business skills amongst entrepreneurs as a shortcoming, which maps to the requirement of education and training within SMEs, also considered as factors inhibiting SME growth (Berry *et al.*, 2002:65). The lack of general business acumen of SME owner-managers necessitates the need for the development and utilisation of a managerial mechanism to manage the occurrence and impact of risk events within SMEs, thus contributing towards SME sustainability.

1.5.2 The concept of risk

To provide the reader with insight into the primary theme of the thesis, the concept of risk will be discussed by providing a definition of risk and furthermore elaborating upon the concepts of risk and performance.

1.5.2.1 Risk defined

Various definitions of risk exist, each with a different perspective based on the industry to which it is being applied. Insurance-based industries define risk as stated by Valsamakis, Vivian and Du Toit (2000:35), as: "A deviation from the expected value. It implies the presence of uncertainty, where there may be uncertainty as to the occurrence of an event producing a loss, and uncertainty as regards the outcome of the event; where the degree of risk is interpreted with reference to the degree of variability and not with reference to the frequency with which the event will occur or to the probability that it will display a particular outcome".

The following business-focused definition of risk is provided by Andersen and Terp (2006:31): "Risk has been defined as internal and external uncertainties, events, or circumstances that the company must understand and manage effectively as it executes its strategies to achieve business objectives and create shareholder value". From the above two definitions, the obvious analogy to be drawn is that the concept of uncertainty is embedded in risk, where the prevalence of risk impacts on the achievement of business objectives.

1.5.2.2 Risk and performance

There are clear tangent planes between risk and performance as risk impacts directly on the degree of performance achieved. Performance can be defined through the measurement of effectiveness and efficiency (Anthony, 1965[3] cited by Ritchie & Brindley, 2007:306). 'Efficiency' refers to the input-output consumption ratio, while 'effectiveness' refers to the achievement of the planned outcome. A more balanced view of performance can be determined through the use of the Balanced Scorecard (Niven, 2002:1-24), which incorporates the financial perspective, internal perspective, customer perspective and innovative and learning perspective of an organisation, with each of these four spheres contributing to performance measurement.

In the context of business decisions, increased risk is traditionally perceived to result in increased returns. Risk as a result impacts on the effectiveness and efficiency of operations and not solely on catastrophic events such as total business failure. The importance of managing risk and thereby the achievement of organisational performance cannot be underestimated.

[3] Anthony, R.N. 1965. *Planning and Control Systems: A Framework for Analysis*. Harvard University School of Business Administration, Division of Research, Boston.

1.5.3 Risk management

Risk management can be evaluated in terms of the evolution of the concept, providing definitions thereof, describing the risk management process, and identification of SME risk elements.

1.5.3.1 Evolution of risk management

The evolution of risk management was mooted by the recognition of management as a profession (Kloman, 1984[4] cited by Valsamakis, Vivian & Du Toit, 1996:13). Management is tasked with the responsibility of protecting and securing the income-generating assets of an organisation (Valsamakis *et al*., 1996:13-14). This entails the development of a structured function in terms of which an organisational risk strategy is set, and risk managers partake through a formal mechanism to deal with change.

1.5.3.2 Risk management defined

Risk management, as it relates to a service business, is defined by Hollman and Forrest (1991:49-50) as: "The protection of a firm's assets and profits. It is a systematic method of using a firm's resources – physical, financial, and human capital – to realise certain objectives concerning pure loss exposures. Pure loss is one where there is a chance of loss, but no chance of gain".

From the above the analogy can be drawn that risk management is a structured approach that utilises various techniques to manage an organisation's exposure. Such a function is relatively easy to perform by executive management, usually the owner-manager, within the context of SMEs. As a rule, the SME executive manager is more actively involved in the process and the implementation of policies (in contrast with larger

[4] Kloman, H.F. 1984. Risk management: 1990 and beyond. *Risk Management*, March:33.

organisations), and has a holistic perspective of risk facing the organisation (Watt, 2007:35).

1.5.3.3 Risk management process

Two fundamental activities, namely the control of risk and the managing of risk outcome underpin the risk management process. Each of these fundamental processes encompass a series of activities that may vary in complexity. The risk management process, determined by a departmental risk strategy, consists of the following subprocesses (Bowden, Lane & Martin, 2001:8-15; and Valsamakis *et al*., 2000:25-27):

- **Step 1 - Risk identification:** Risk identification involves the comprehensive identification of risks that can impact on the organisation's subprocesses.
- **Step 2 - Risk evaluation:** This is the core process of risk management. During risk evaluation, the level of risk is quantified by determining the frequency with which events will occur and the impact of the consequences.
- **Step 3 - Risk control:** Risk treatment measures are evaluated or designed by management and implemented, to control the impact of the risk. Risk identification is usually executed by management, while the implementation processes are usually executed by staff. Risk control measures include:
  - Risk transferring or risk sharing, where risks are transferred or shared with third parties, for example insurance.
  - Risk reduction that limits the occurrence of risk or the impact of the risk.
  - Risk acceptance by the organisation as a result of cost-benefit analysis or other factors.
- **Step 4 - Risk monitoring:** This step entails the monitoring and evaluation of the effectiveness of the control mechanisms employed by the organisation.

Due to the evolving nature of risk, business processes and the business environment, the risk management process should be reviewed and adapted continuously to safeguard the organisation's resources, and comply with the defined risk strategy. A schematical depiction of the core activities in the risk management process is provided in Figure 1.2 below.

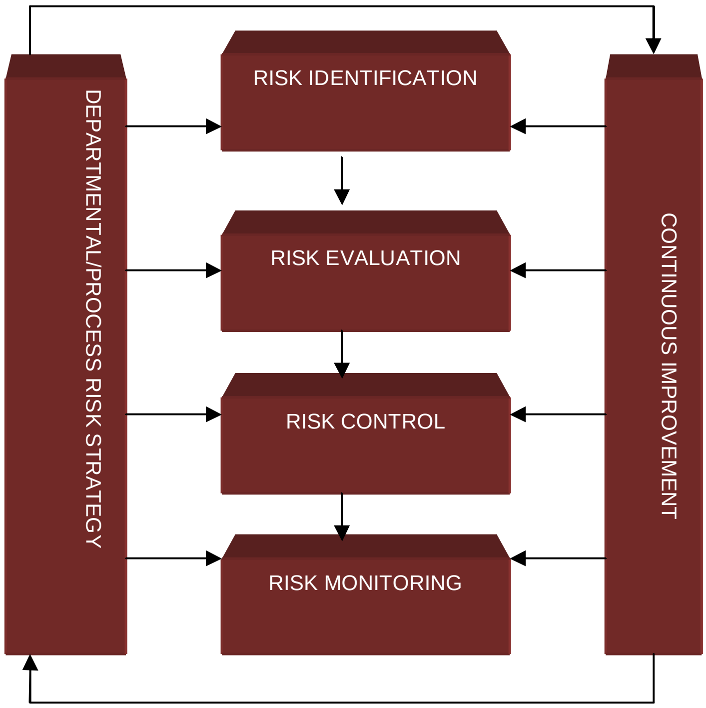

Figure 1.2: Core activities in the silo-based risk management process.

1.5.3.4 SME risk elements

In South Africa, SMEs experience difficulty in securing finance because of the high level of risk and insufficient level of return associated with the industry (Pretorius *et al.*, 2003[5] cited by St-Pierre & Bahri, 2006:547). Clear tangent planes exist if compared with other developing countries such as Malaysia, where SMEs face similar obstacles (Rahman, Mahmood & Rahman, 2003:Online; and St-Pierre & Bahri, 2006:547).

[5] Pretorius, M., Shaw, G. & Van Vuuren, J. 2003. *Business plans in bank decision-making when financing new ventures*. Paper presented at 48th World Conference International Council for Small Business, Belfast.

A small business characteristic impacting on risk and subsequently on management practices employed, is the difficulty experienced in separating ‘owner-manager property’ from ‘business property’. Other complex SME elements embedded in typical business operations such as variable, not easily identifiable and unique owner-manager objectives, further influence the risk composition (LeCornu, McMahon, Forsaith & Stanger, 1996:1-14; Naffziger, Hornsby & Kuratko, 1994:29-42; and Julien & Marchesnay, 1996[6] cited by St-Pierre & Bahri, 2006:550).

The traditional approach to SME risk is biased in favouring the lender’s financial-based risk analysis. Modern risk measurement matrixes recognise the multifaceted nature of the SMEs’ total risk. Various authors such as Carlton (1999:Online), Cotner and Fletcher (2000:27-33), and St-Pierre (2004[7]) cited by St-Pierre and Bahri (2006:550-551), recognise that total risk constitutes ‘financial risk’ as well as ‘business risk’, with business risk comprising risk categories such as management risk (inadequate management knowledge, etc.), commercial risk (client risk, market importance, etc.) and technological risk (research and development activities, use of technology, etc.).

1.5.3.5 Evolution of risk management to enterprise risk management

Historically, risk has been viewed from an insurance perspective, with limited integration with other managerial functions. This silo approach to risk is questioned by Strutt (1989[8]) and Kloman (1987[9]), cited by Valsamakis *et al.* (2000:18), favouring a more holistic risk management approach. The increase in global competition and the volatility of international markets have elevated risk management to the forefront of business thinking. An integrated risk management approach or Enterprise

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[6] Julien, P.A. & Marchesnay, M. 1996. L’entrepreneuriat. *Économica*.
[7] St-Pierre, J. 2004. *La gestion du risqué: comment améliorer le financement des PME et favoriser leur développement*. Presses de l’Université du Québec, Quebec.
[8] Strutt, R.S.G. 1989. *The reality of risk management*. Paper presented at the Institute of Risk Management AIRMIC Conference, April:3-6.
[9] Kloman, H.R. 1987. Risk management … by many other names. *Risk Management*, June:56-62.

Risk Management (ERM) approach is suggested by Valsamakis *et al.* (2000:21), that is “comprehensive, inclusive and proactive”.

The evolution from ‘risk management’ to ‘ERM’ is intended to transform silo-based risk management practices to a cross-functional risk management activity, where risk identification, evaluation and management impact on the achievement of an organisation’s objectives. Integrated risk management lends itself to a coordinated approach in managing strategic and operational-tactical processes. As a result, the management of risk is not focused purely on the management of negative events, but also on the realisation of opportunities (Henriksen & Uhlenfeldt, 2006:122-126).

Figure 1.3 below provides a schematic depiction of the evolution of the risk management process.

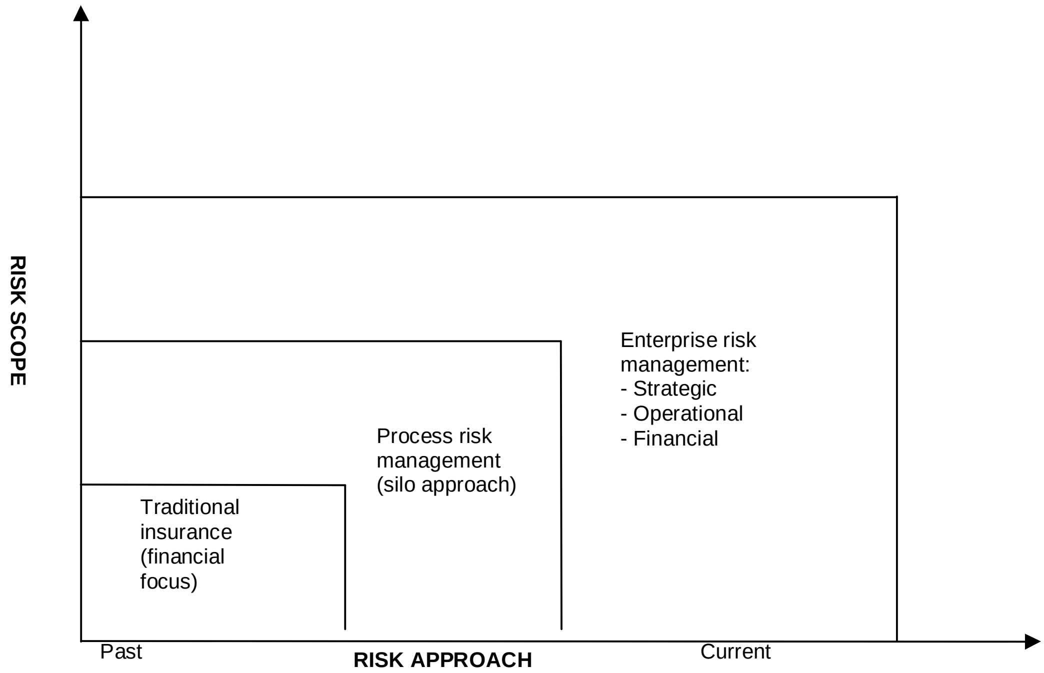

Figure 1.3: Evolution of the risk management process (**Source**: Adapted from Miccolis, Hively and Merkley, s.a.:xxiii).

1.5.4 Enterprise risk management defined

The Committee of Sponsoring Organisations of the Treadway Commission (COSO, 2004:Online), defines ERM as follows: "Enterprise risk management is a process, effected by an entity's board of directors, management and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risk to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives".

A simplified definition of ERM is provided by Miccolis *et al.* (S.a.:xxii), defining ERM as: "A rigorous and coordinated approach to assessing and responding to all risks that affect the achievement of an organization's strategic and financial objectives. This includes both upside and downside risks".

A broad definition of ERM focuses on the achievement of business objectives through the participation of all stakeholders at every level of the organisation. It should be noted that ERM constitutes multidirectional, repetitive processes, where activities influence one another with the primary differentiating factor, the focus on strategy.

Strategy-focused integrated risk management frameworks such as DeLoach's enterprise-wide risk management framework (DeLoach, 2000:213), COSO's enterprise risk management framework (COSO, 2004:Online), FERMA's risk management standard (FERMA, 2003:Online) and the Australian/New Zealand risk management framework (AS/NZS 4360, 2004:Online), incorporate a holistic perspective on the management of the total risk portfolio of an organisation (Henriksen & Uhlenfeldt, 2006:111-112). A generic six-stage enterprise risk management framework can be extrapolated from the abovementioned frameworks, which maps to the risk management process as described in Paragraph 1.5.3.3, taking into consideration the strategic step of objective-setting as the starting point in the process. Within the context and application of

ERM, top management's first step is to develop the company's strategy and objectives, driven by its mission and vision. It is of interest to note that the differentiating factor 'strategy', should not be limited to the implementation of strategy, but should actively include strategy formulation, which incorporates the two-sided perspective of risk focusing on negative and positive risk occurrences (Henriksen & Uhlenfeldt, 2006:112-124). As a result, prior to undertaking risk management activities, the organisational risk philosophy and risk tolerance should be established in order to formulate an organisational risk strategy for the management of risk. The organisational risk philosophy is based on the organisational goals and the shareholders' or owners' expectations. Risk tolerance in turn is based on the financial resources the organisation has to its disposal, as well as the amount the organisation is willing to lose (Banks & Dunn, 2003:73).

Risk taking is implicit in all business activities. Without calculated risk taking, business stagnation occurs as opportunities such as market expansion and product innovation are curtailed. As a result, entrepreneurs will favour a risk approach that focuses on and optimises positive outcomes, while managing potential exposure (Watt, 2007:36-37).

1.5.4.1 Value-adding enterprise risk management

By embedding an ERM system into an organisations' strategic and operational processes, risk can be managed from a holistic and systematic perspective. Such an ERM approach would enable organisations to focus on positive risk occurrences that foster sustainable growth through improved decision-making, and proactive risk management. An integrated risk management practice would enhance the organisation's flexibility, providing a competitive advantage over competitors who do not utilise such a framework (Schrøder, 2006:65-66).

The incorporation of ERM practices within an organisation, provides managers with a common language to define and manage risk.

Furthermore, an effective risk assessment process and framework would support the organisation's strategies and risk acceptance by creating an optimum balance between risk, control and growth, eliminating unacceptable risks and strategic errors (DeLoach, 2000:208).

For large and small organisations alike, ERM entails the development of organisational objectives, the identification of risks which may impact on the defined objectives, and the development of a process to manage the risk in an organisation. Small organisations have an advantage as far as ERM is concerned in that it is easier for management to be actively involved in ERM processes, than it would be in larger organisations. The development and implementation of an ERM system in a small organisation's processes would therefore be easier, especially if the following value-adding capabilities (Watt, 2007:33-40) of small organisations' ERM practices are promoted:

- The organisation's focus is directed at its mission and vision without straying.
- The organisation complies with best practices.
- A reduction in insurance premiums can be achieved.
- Avoid the overmanagement of risks, i.e. risk should be managed in a cost-effective manner.

1.5.4.2 Impediments to risk management

The potential obstacles impacting on the effective implementation of ERM are elaborated upon below:

- Organisational culture i.e. the attitude of employees towards ERM is an obstacle to effective ERM implementation (Truslow, 2003:Online; and Miccolis *et al*., s.a.:5).
- The priority of senior management is identified by Merkley (2001:25-27) as an obstacle impacting effective ERM implementation. Senior managers should show active support of ERM and drive the process (Chapman, 2001:30-37).

- The reluctance to discuss sensitive issues on an organisation-wide basis further impacts on the success of an ERM implementation (Funston, 2003:59-63).
- Inherent complexities embedded in the ERM process necessitate the need for the allocation of the process to a specific organisational unit to ensure ERM continuity and consistency (Nakada & Tange, 2003:30-31).
- A lack of ERM tools, formulised processes and risk understanding are obstacles to effective and efficient ERM implementation (Miccolis *et al*., s.a.:5).

1.6 RESEARCH DESIGN

In this thesis the concept of applied research will be undertaken, as the concept refers to research, which has been designed to apply its findings to solving a specific, existing problem. Furthermore, the research will be undertaken in the social world, as social science has to do with how things are and why (Babbie, 2005:12).

The research will furthermore have an empirical/theoretical underpinning. In this respect, empirical is defined as 'based on, or guided by the results of observation', while theoretical is defined as 'contemplative of the mind or intellectual faculties' (Remenyi, Williams, Money & Swartz, 2002:31; and Leedy & Ormrod, 2001:101).

This dualistic approach (empirical/theoretical) was specifically selected since empirical research in business and management requires intensive interaction with people, while theoretical research in business and management requires an intensive textual investigation (Leedy & Ormrod, 2001:101).

This empirical/theoretical research approach would by its very nature call for the application of methodological triangulation. In this respect, both a positivistic (quantitative) and phenomenological (qualitative) research paradigms will apply (Leedy & Ormrod, 2001:102). This approach is supported by Babbie (2005:25), who expresses the opinion that "… recognizing the distinction between qualitative and quantitative research doesn't mean that you must identify your research activities with one to the exclusion of the other. A complete understanding of a topic often requires both techniques".

Case study research will form the primary research method since a contemporary phenomenon (SME risk) within its real life context will be examined where the boundaries between phenomenon and context are not clearly defined. Yin (1994:1), states that case study research is especially applicable to the social sciences as well as professional fields such as the management sciences. More specific, an experimental case study will be conducted as the proposed research will examine difficulties associated with implementing new procedures and techniques in organisations and evaluating the benefits (Collis & Hussey, 2003:68-70).

The research unit of analysis (Yin, 1994:20-27), will be owner-managers of SMEs, drawn from a sample (Collis & Hussey, 2003:155), made up of members (population) of owner-managers of SMEs in the Western Cape forming the sampling frame (Vogt, 1993:202). Furthermore, purposive sampling (Cooper & Emory, 1995:228), will serve as the sampling method, in terms of which 158 SME owner-managers will be selected. Data collection will be via questionnaires executed within the ambit of a survey (Remenyi *et al*., 2002:290). Data analysis will be conducted using descriptive and inferential statistics (Cooper & Schindler, 2006:463-468, 492).

1.7 DELINEATION OF THE RESEARCH

The research in this thesis will be limited to SME's in the South African retail trade. Furthermore, the research will only extend to include owner-managers of SMEs in the Western Cape.

1.8 CONTRIBUTION OF THE RESEARCH

The output of this research will culminate in the formulation of a structured risk management model for SMEs. This model will enable SME owner-managers to recognise the various risks they are subjected to from day to day and assist them in responding appropriately to these risks. Furthermore, the proposed risk model has the potential to enhance policy-makers understanding of SME risk and to aid in the formulation of more effective SME policies. Ultimately, through the formulation of a structured risk management model, the contribution of the research will limit the number of SMEs that fail in South Africa as a result of poor risk management.

CHAPTER 2
RISK MANAGEMENT – A LITERATURE REVIEW

SYNOPSIS

Uncertainty gives rise to risk as it influences the achievement or non-achievement of organisational goals. This necessitates the need for a structured organisational process in terms of which risks are effectively managed. SME management in general should be tasked with identifying the appropriate approach to risk classification and assessment for achieving optimal results.

A well-developed risk management process will usually comprise risk planning, which forms the foundation of the risk management process, where goals and objectives are determined to be used as reference in the measurement of the adequacy of the risk process. This is followed by a hybrid of qualitative and quantitative risk identification techniques, identifying key risks usually sourced through the use of a consultative approach in terms of which input is gleaned from as many stakeholders as possible. Risk identification is followed by risk assessment, where risks can be evaluated at various organisational levels according to the frequency and impact of risk occurrence. This can assist with the prioritisation of risk factors to determine the organisational importance thereof.

Selecting the risk mitigation options encompasses the next step in the risk management process. By following the comprehensive risk process, informed decisions can be taken to engage in various risk options such as risk avoidance, risk acceptance, risk transfer and risk mitigation. The final step of the risk management process includes risk monitoring, whereby the effectiveness of the process is measured within the boundaries determined by management, while taking into account the constantly changing internal and external organisational environment and the resulting effect on organisational activities.

Greater transparency in organisational activities, increased risk awareness, corporate accountability, and the safeguarding of organisational assets are all rationales for engaging in risk management. Traditional risk management approaches are however inefficient due to their segmented approach to risk without regard to the tangent planes between the various risk elements. This necessitates the need for the development and application of an all-inclusive enterprise risk management approach.

The content of Chapter 2, along with the relative positioning of the topics, is graphically depicted in Figure 2.

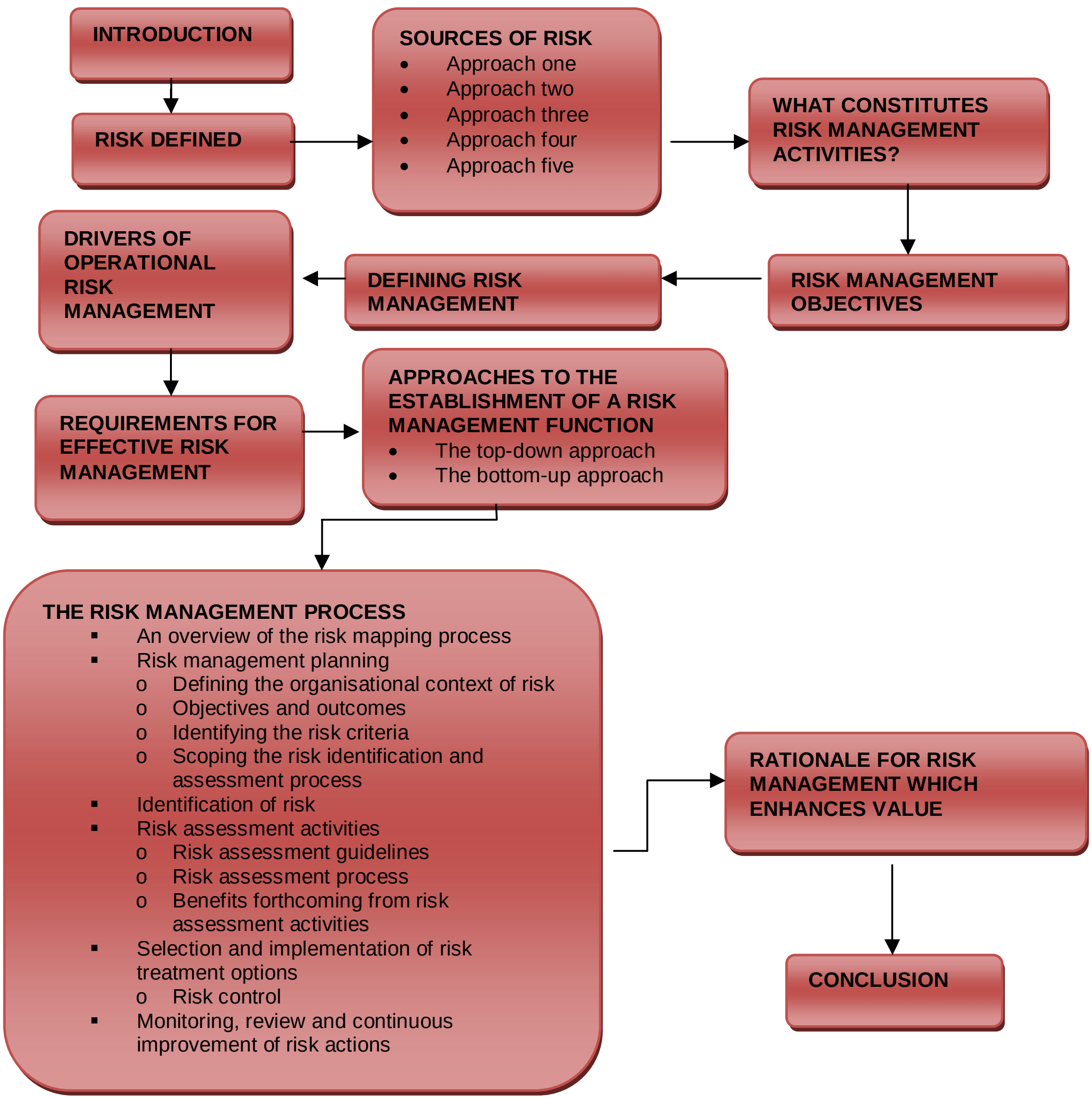

Figure 2: Detailed layout of Chapter 2 – Risk management: A literature review.

CHAPTER 2

RISK MANAGEMENT – A LITERATURE REVIEW

2.1 INTRODUCTION

The analytical process followed thus far is graphically depicted in Figure 2.1, placing the chapters in context with the overall thesis objectives, and furthermore indicating the relative positioning of this chapter.

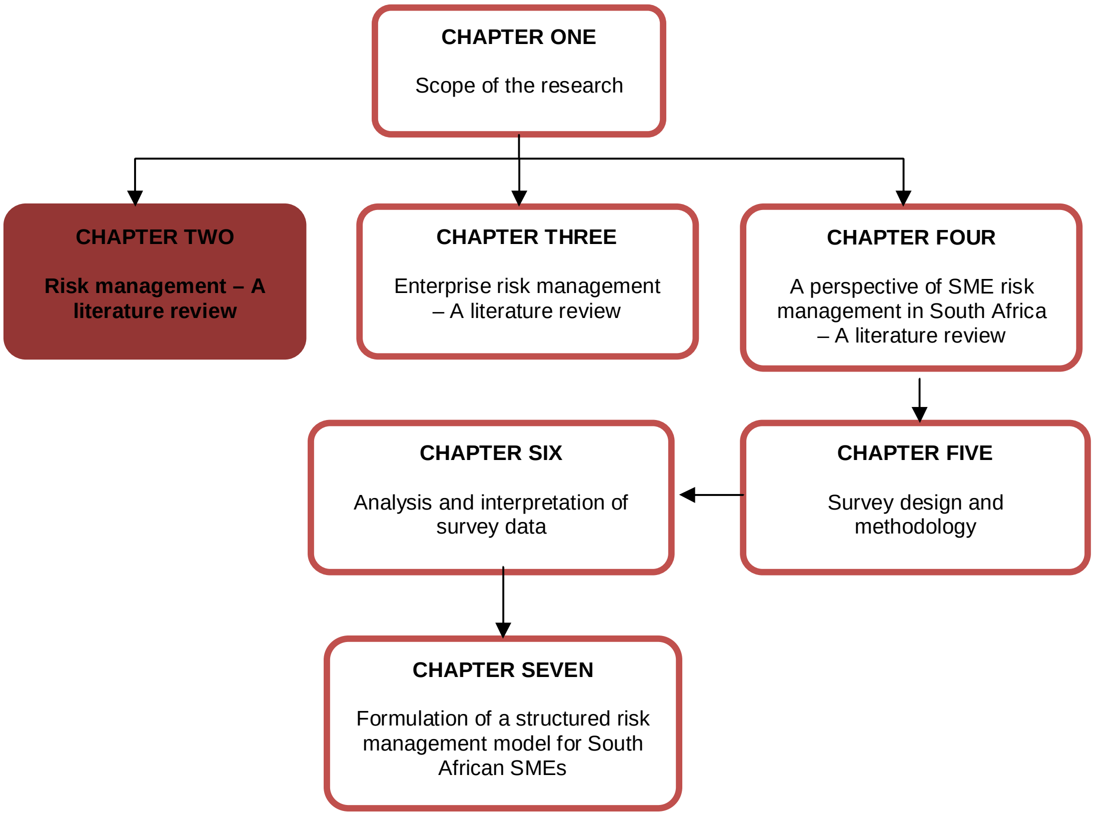

Figure 2.1: Chapter 2 – Risk management positioning.

The premise of risk is uncertainty, where the achievement of objectives is subjected to the occurrence and/or non-occurrence of events (IIA, 2010: Online). Uncertainty, and thereby risk, prevails in all spheres of life, business, the economy and the environment, where volatile market relations increase uncertainty in environments within which organisations operate (DEAT, 2006:Online; and Tchankova, 2002:290).

Risk is inherent to all business activities and it affects all managerial levels (Towers Perrin, 2008:Online; Bowling, Julien & Rieger, 2003:16; Tchankova, 2002:290; and Spira & Page, 2003:641). Business executives are faced with risks arising from external forces outside their immediate control, such as distressed financial markets, mergers and acquisitions, disruptive technology changes and geopolitical instabilities (Towers Perrin, 2008:Online). These external forces combine with a myriad of internal forces, such as changes in the governing structures of organisations, and need to be managed (Bowling *et al*., 2003:16; and Spira & Page, 2003:641).

Managing risk has always been an inherent responsibility of management. However, changing conditions such as increased specialisation, globalisation of trade, and interconnectivity between organisations have changed organisations' risk appetite[10]. Media coverage coupled with communication advances, leaves little organisational manoeuvrability in times of crises, which forces organisations to adopt a more structured approach in the handling of risks (Andersen & Terp, 2006:44-45; and Kimball, 2000:1).

To effectively manage or control risk however, the nature, probability of occurrence, and impact of the risks need to be determined. The risk management process provides an effective, structured approach for the identifying, evaluation and controlling of risks (DEAT, 2006:Online). While effectively controlled risk exposures limit the potential impact of losses, it does not eliminate undesirable events from occurring. A structured evaluation of the risk environment facilitates preparedness for addressing risk and provides financial protection to shield the organisation from the full impact of the adverse event. The rationale for employing risk management actions in many organisations is that a controlled risk environment will reduce the occurrence of unexpected events, as well as the total cost of

[10] IIA. 2010. Risk appetite is defined as, "…the level of risk that an organization is willing to accept".[Online]. http://www.theiia.org [6/5/2011]

risk, thereby releasing funds for other value-adding purposes (Andersen & Terp, 2006:44-45).

Properly managed, risk fuels growth and opportunity (Towers Perrin, 2008:Online). Organisations embark on various initiatives, which may result in a spectrum of outcomes, in order to secure market share. The possibility of these outcomes being realised, determine the associated risk in the organisation's activities. Risk is embedded in all organisational activities and spheres of management. Management is however faced with the challenge that risk-taking is an essential element for promoting innovation and change, however it is increasingly difficult to execute risk activities in a risk management environment (Borgelt & Falk, 2007:122). Innovation requires unconventional and entrepreneurial thinking and can only exist when management allows and promotes well-considered risk-taking, executed and controlled by an informed and skilled work force. The amount of risk ignorance in an organisation is proportionate to the amount and type of risk management solutions required to counter potential negativity associated with risk taking. This places the onus on management striving for change or innovation to establish and foster a knowledge culture that is supportive of controlled risk-taking (Borgelt & Falk, 2007:122).

2.2 RISK DEFINED

Uncertainty arises in situations where decision-makers have incomplete knowledge, information or understanding of activities and their possible consequences. As a result, uncertainty exists due to people's 'knowledge vacuum' of future events. The level of perceived uncertainty depends on the availability of information to evaluate the possibility of outcomes, as well as on the decision-makers' ability to evaluate the information (Valsamakis *et al*., 2000:31-32). In its extreme form, uncertainty refers to the total absence of information or awareness of a potential event occurring, regardless of its outcome (Ritchie & Brindley, 2007:305-306).

Uncertainty therefore pertains to the possibility of an event realising, and the outcome of the realised event.

The concept of risk may be regarded as interrelated to uncertainty given the perception that uncertainty gives rise to risk. Events with outcomes that lack predictability hold risks, although such outcomes may be assigned objective probabilities. Risk prone outcomes therefore hold the possibility of numerous values, with the particular value being unpredictable (Valsamakis *et al*., 2000:31-32; and DEAT, 2006:Online). In a business context, uncertainty and by implication risk, impacts on the achievement of organisational objectives (McNamee, 1998:7).

Risk is embedded in economic activities through various economic resource outflows, which are invariably undertaken without knowing whether positive economic inflows will result (Kimball, 2000:4) According to Spekman and Davis (2004:416-417), the following aspects of risk should be considered:

- It is context specific.
- It can be defined as objective (i.e. inherent in card games) or subjective (i.e. an individual's assessment of a situation motivates him to take certain actions).
- It is determined on a personal and organisational level (Spira & Page, 2003:640-661).
- Risk-taking is influenced by group behaviour as opposed to individual actions (Giliberto & Varaiya, 1989[11] cited by Spekman & Davis, 2004:416-417).

There are almost infinite definitions of risk which is governed by the specific discipline it occurs in (Kimball, 2000:4; and Ritchie & Marshall, 1993[12] cited by Ritchie & Brindley, 2007:305). It is important to define risk in a manner that does not limit such definition within a specific context. From a generic perspective, risk can be defined as, "… the possibility of

[11] Giliberto, S.M. & Varaiya, N. 1989. The winner's curse and bidder competition in acquisitions: evidence from failed bank auctions. *Journal of Finance*, 44(1):59-75.
[12] Ritchie, R.L. & Marshall, D.V. 1993. *Business Risk Management*. London: Chapman Hall.

deviation in an expected outcome" (Spekman & Davis, 2004:416). With the growing emphasis on risk management as a systematic process, it is important to provide a more rigorous definition of risk, enforcing the fact that risk implies a level of uncertainty.

Valsamakis *et al*. (1996:24-27; 2000:32-35) propose the following definition for the concept of risk: "Risk is defined as the variation of the actual outcome from the expected outcome. Risk therefore implies the presence of uncertainty. Managing risk implies not only the financial provision for the consequences of an event, but the effort to:

- Reduce or minimise the likelihood of the loss-producing event occurring.
- Reduce or minimise the adverse effects once the event has occurred".

Sitkin and Pablo (1992:9[13]) cited by Ritchie and Brindley (2007:305) define risk as: "… the extent to which there is uncertainty about whether potentially significant and/or disappointing outcomes of decisions will be realised".

The Collins English Dictionary (1998:1328[14]) cited by Borgelt and Falk (2007:123), defines risk as "to be in peril".

Briers (2000:8) define risk as: "Risk is a human behaviour with imperfect knowledge about future outcomes that can vary intended rewards".

Most definitions of risk address the following risk elements (Ritchie & Brindley, 2007:305-306):

- The probability of an event occurring or its outcome.
- The consequences of the event or its outcome.
- The causal pathway leading to the event.

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[13] Sitkin, S.B. & Pablo, A.L. 1992. Reconceptualizing the determinants of risk behaviour. *Academy of Management Review*,17(1):9-38.
[14] Collins English Dictionary. 1998. *Collins English Dictionary (Australian)*, 4th Edition, London: Harper-Collins.

The probability of an event occurring can be expressed in either 'objective' or 'subjective' terms, using different measuring scales. Consequences can also be expressed from various perspectives, including simultaneous multiple perspectives, e.g. a failure of a new product launch may impact adversely on the organisation's reputation as well as its financial performance. Managers typically regard risk as the downside effect of an outcome specifically tied to the notion of economic loss (Chiles & McMackin, 1996[15] cited by Spekman & Davis, 2004:416). One should however exercise due care in limiting risk consequences to negative occurrence only, as the rationale for risk taking creates the potential opportunity to create positive outcomes (McNamee, 1998:70; and Ritchie & Brindley, 2007:306). The third element of risk namely the 'causal pathway', refers to the nature of the event, the sources of the event, and the causes created by the realisation of the event, which impact on the probability of the event occurring and the severity of the event's outcomes (Ritchie & Brindley, 2007:305-306).

It is of importance for the reader to note that risks are not limited to purely catastrophic events, but also refers to potential events that impact on the effectiveness and efficiency of operations influencing the ongoing performance of an organisation. As a rule, management would however focus on those events that may have a significant impact on the organisation's performance or risk profile. Furthermore, the interconnectedness of risk should be taken into account since it does not only affect a specific activity, but in addition impacts on various related and seemingly unrelated activities. Potentially all organisational activities are exposed to risk, although the risk impact may be reduced through other organisational processes (Ritchie & Brindley, 2007:310).

[15] Chiles, T. & McMackin, J. 1996. Integrating variable risk preferences, trust, and transaction cost economics. *Academy of Management Review*, 21(1):73-100.

2.3 SOURCES OF RISK

Academic authors from time to time use the concept of a 'risk approach' for which 5 approaches were developed to classify and define risk. However, risks in the managerial discipline will by nature imply that only certain risks embedded in corporate activities will concern this discipline (Valsamakis *et al*., 1996:27-28; 2000:35). Irrespective of the risk environment or the definition of risk used, it is essential to determine the type of risk expected and to rationalise it relative to the nature of the activity or organisation (DEAT, 2006:Online). The five risk approaches referred to above, are elaborated upon below to provide clarity on risk classification definition.

2.3.1 Approach one

A risk classification may be drawn according to the possible outcome, differentiating between pure and speculative risks. Pure risks have no chance of gain and are typically insurable such as environmental and safety risks. The focus is therefore directed towards 'loss management' as opposed to 'risk and uncertainty management' (Williams, Smith & Young, 1998:26-27). In contrast, speculative risks, also termed business risks, can have positive or negative outcomes. Examples are interest rate risks, research and development risks, etc (Andersen & Terp, 2006:31). Pure loss concerns the ultimate outcome of either loss or no loss, while speculative loss concern the outcome of either a loss or a gain (Williams *et al*., 1998:7-8). Pure loss is therefore assessed on a one-dimensional scale, while speculative risks require two separate assessments relating to positive and negative outcomes (DEAT, 2006:Online). The management of these two risk categories differ in that pure risk outcomes can often be mitigated by risk management techniques, while speculative risk outcomes (which are conventional uninsurable risks), are usually managed through hedging (Valsamakis *et al*., 1996:27-28; 2000:35). Table 2.1 (Waring &

Glendon, 1998[16] cited by DEAT, 2006:Online) depicts a list of pure and speculative risks that are considered threats and hazards to an organisation.

Table 2.1: Examples of pure and speculative risks (**Source**: Waring & Glendon, 1998 cited by DEAT, 2006:Online).

HAZARDS AND THREATS (OBJECTS OF RISK MANAGEMENT)	
Pure risk topics	**Speculative risk topics**
Occupational health and safety	Financial/credit risks
Fire	Investments
Security	Business risk
Environmental	Political risks
Quality assurance	Social/cultural risks
IT reliability	Human resources
Business interruption	Marketing
Flood	IT strategy
Earthquake etc	Total quality management etc

2.3.2 Approach two

According to Williams *et al*. (1998:66-68) and Tchankova (2002:293-295), a general risk classification differentiates between physical, social and economic sources. Further in-depth classification of risk is essential to facilitate efficient risk identification. As a result, the sources of risk can be identified according to the environment in which they prevail as elaborated upon below:

- **Physical environment:** The influence of the environment on people as well as people's impact on the environment are important elements in this source of risk. The physical environment can also be a source of opportunity, e.g. a region's climate can be a positive factor to tourism.
- **Social environment:** Sources of risks are mooted from changes in people's values, human behaviour and interaction, and the state of

[16] Waring, A. & Glendon, A.I. 1998. *Managing Risk*. London: Thompson Learning.

social structures, e.g. employees' skills and loyalty may have a profound impact on the organisation's success; changing attitude towards minority groups can provide access to a new talent pool.

- **Political environment:** The ruling party of the land affects organisations in different ways, e.g. decreasing subsidies to certain sectors. The political environment in international trade is complex and can extend its influence in a number of ways, e.g. differences in the ruling system leads to different attitudes and policies towards trade; opportunities are created by fiscal and monetary policy.
- **Operational environment:** Risks and opportunities are created by the operational environment, e.g. manufacturing activities may cause employees harm; the operational environment may improve the employee's personal environment.
- **Economic environment:** Globalisation creates a global market that needs separate consideration, e.g. on an international front, depression and recession are the result of interdependent economic systems. Locally, credit policy and interest rates may be sources of risk to organisations.
- **Legal environment:** Risk and opportunities arise from the disparity of new laws. Internationally, the complexity increases due to variations in the legal system, which may lead to conflict amongst business partners. The upside is that the legal system provides a framework for organisations to function in, thereby providing stability to the organisations and society alike.
- **Cognitive environment:** People's perception of risk compared to the reality thereof, is a source of risk. The evaluation of uncertainty and the methods used to determine whether a risk is real, are considered in this environment.

2.3.3 Approach three

Doherty (1985[17]), and Greene and Serbein (1983[18]), cited by Valsamakis *et al*. (1996:27-28; 2000:35), classify risks into the following categories:

- Marketing risk.
- Financial risk.
- Environmental risk.
- Property and personnel, and personnel and production; or resource management risk.

2.3.4 Approach four

The Institute of Risk Management South Africa's (IRMSA) Enterprise Risk Management Code of Practice (2004[19]) cited by DEAT (2006:Online) classifies business risks into the following categories:

- **Strategic risk:** Risks impacting on business strategy and organisational long-term plans.
- **Value-based risk:** Risks impacting on the monetary value of an item.
- **Process-based risk:** Risk impacting on the way an activity is performed or a process is executed.
- **Information-based risk:** Risk impacting on the availability, quality and quantity of information used for decision-making.
- **People-based risk:** Risk arising from the occurrence or non-occurrence of people's activities.
- **Environmental risk:** Risk impacting on the micro- and macroenvironment.
- **Compliance risk:** Risk arising from compliance or non-compliance with standards, policies, laws, regulations, etc.

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[17] Doherty, N.A. 1985. *Corporate risk management - A financial exposition*. New York: McGraw-Hill.
[18] Greene, M.R. & Serbein, O.N. 1983. *Risk management: Text and cases*. Virginia: Reston Publishing.
[19] Institute of Risk Management South Africa (IRMSA). 2004. *Enterprise Risk Management – Code of Practice*.

- **Asset risk:** Risk impacting on the organisation's assets, e.g. cash, investments, property, assets.

2.3.5 Approach five

The Institute of Chartered Accountants in England and Wales (ICAEW, 1999b[20]) cited by Fraser and Henry (2007:392-393), provides guidance to organisations implementing the 'Turnbull Report', renamed the 'UK Corporate Governance Code' (UK Code, 2010:Online), by classifying risks into the following categories:

- Financial risk,
- business risk including strategic risk,
- compliance risk,
- operational risk, and
- other risks.

The relative importance of the cited risk categories differs among business industries. For example, the construction industry regards the following risks (in order of importance), as the risk categories impacting on their business environment: Financial risk, technical risk, time risk, operational risk, environmental risk and political risk. The following risks impact on operations in the oil industry (in order of importance): Financial risk, technical risk, operational risk, environmental risk, time risk and political risk (Baker, Ponniah & Smith, 1999:101).

Behavioural risk is an important risk in all spheres of an organisation. Some of the largest losses suffered by organisations are due to the encouragement of risky behaviour in for example bonus and reward schemes. Although risk-taking is paramount to organisational growth, the importance of balancing the risk should be acknowledged by executives, who encounter a broad range of risks and pressures from external sources such as shareholders and government. Executives should therefore take

[20] ICAEW. 1999b. *Implementing Turnbull – A Boardroom Briefing*. Institute of Chartered Accountants in England and Wales Audit Facility, London.

calculated risk related decisions. Decision risk and behaviour around decision-making apply to all organisational units, however its primary focus is directed at the top executives and the people responsible for dealing with crises. At-risk behaviour with possible negative consequences for organisations are:

- Decision-makers' inability to recognise warning signals, resulting in the escalation of at-risk situations.
- The inability of decision-makers to apply the warning signs of past failures to current situations.
- Decision-makers do not acknowledge their own shortcomings.

Furthermore, decision-makers may be convinced that they cannot influence an event, therefore not taking any action towards it, while such event might be entirely preventable. To address this behaviour Mundy (2004:16), suggest the following practices:

- Important decisions should involve more than one person.
- An independent evaluator should be assigned to decision-making committees.
- All members of a decision committee should participate in an open discussion about the positive and negative consequences of a decision.
- Decision committees should promote and acknowledge debate around their ideas to improve the decision process.

The Economist Intelligence Unit's 'Corporate Risk Barometer' (EIU, 2005[21]) cited by Borgelt and Falk (2007:123), reports on a risk survey of 137 senior risk management specialists world-wide. The survey assessed various risks such as financial, regulatory, credit, market, information technology, foreign exchange, political and reputational risks. The survey concluded that managers are of the opinion that business risks have increased significantly. This enforces the principle that to deal effectively with risk, risk managers must have a thorough understanding of risks, risk

[21] EIU (Economist Intelligence Unit). 2005. *EIU* Corporate risk barometer: What is keeping you awake at night? *Corporate Finance*, 242:5-9.

management practices as well as the methods used to optimise such risk management practices.

Despite the increase in business risk, Wince-Smith (2005:25[22]) cited by Borgelt and Falk (2007:123), states that: "You can't innovate and grow unless you're willing to take risks. However, in the current regulatory and tort environment, companies are more focused on risk reduction than ever before". The organisation's focus on risk reduction is primarily due to the need for shareholders to protect their investments and reduce at-risk behaviour by closely monitoring management's actions and aiding in good governance practices (Gilson, 1990[23], Jensen, 1993[24], Shleifer & Vishny, 1986[25] cited by Borgelt & Falk, 2007:123). According to the results from the corporate barometer survey reputational risk, i.e. any risk that can influence an organisation's reputation is perceived as the most important risk organisation's face. The importance of reputational risk is emphasised as being, "… almost three times that of financial, terrorism or political risk exposure and almost four times that of crime and natural disaster risk exposure" (EIU, 2005:5[26] cited by Borgelt & Falk, 2007:124). The growing importance of reputational risk is due to the shifting of risk managers' focus from financial to less understood areas, with reputational and regulatory issues as the most critical areas. This indicates that there is a direct correlation between the potential of risks in certain areas and the lack of knowledge or understanding in that same area. The employment of risk management techniques is however obstructed by the fact that such techniques can only be applied to risks that are accurately perceived by employees as threatening the organisation's resources (Tchankova, 2002:295-297; and Borgelt & Falk, 2007:124). There are numerous risk approaches to use in the classification of risk and the evaluation thereof consequently, to ensure optimum results, it is essential that management

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[22] Wince-Smith, D. 2005. Innovate at your own risk. *Harvard Business Review*, 83(5):25.
[23] Gilson, S. 1990. Bankruptcy, boards, banks and blockholders. *Journal of Financial Economics*, 27:355-387.
[24] Jensen, M. 1993. The modern industrial revolution exists and the failure of internal control systems. *The Journal of Finance*, July:831-880.
[25] Shleifer, A. & Vishny, R. 1986. Large shareholders and corporate control. *Journal of Political Economy*, 94:461-488.
[26] Refer to footnote 21.

select and plan what approach to use to mitigate the risk (DEAT, 2006:Online).

2.4. WHAT CONSTITUTES RISK MANAGEMENT ACTIVITIES?

In its most elementary form, risk management implies the actions taken by an organisation to alter its risk/return profile of future economic benefits flowing to the organisation. As a rule, the term frequently used for an attempt by managers to reduce risk, is known as 'hedging'. Should however management increase the organisation's risk exposure because of the possibility to increase profits, the term frequently used for this action is known as 'speculating' (Cummins, Phillips & Smith, 1998:30).

According to Cummins *et al.* (1998:30), there are numerous ways in which organisations can alter their risk exposure or risk profile, for example:

- **Diversification:** Diversification can limit an organisation's net risk.
- **Operating leverage:** Expenditures can be linked to revenue. Organisations can structure their expenditure to increase when revenue is high (for example the use of manual labour instead of automated processes), and decrease when revenue is low (automated processes require economic outflow regardless of the level of revenue).
- **Financial leverage:** The organisation's choice of debt versus equity finance is a risk management technique.
- **Distribution of cash flow:** Organisations can use derivative securities to alter the distribution of their cash flows.
- **Accounting practices:** Accounting practices can be used to ensure relative stable earnings.

The objective of risk management is not the elimination of risk. In practice, organisations decide amongst the types and degrees of risk exposure, engaging in those activities that can result in a competitive advantage and laying off others through the use of the capital markets, or accepting minor exposures while ensuring against catastrophic ones (Stulz, 1996[27] cited by Kimball, 2000:4).

Risk management is an essential part of organisational processes in that it helps the organisation in the effective achievement of its goals. It is a continuous process that is directly influenced by the changes in the internal and external organisational environment, and enforces the need for continuous risk identification and control (Tchankova, 2002:290).

2.5. RISK MANAGEMENT OBJECTIVES

Organisations vary in size, forms of incorporation and complexity. As a result, the objectives of risk management vary among organisations and are dependent on the organisation's risk environment. Some of the more generic objective according to Andersen and Terp (2006:31-32) includes:

- **Greater transparency:** To assist executive management, owners and potential investors in evaluating the significant organisational exposures and appropriateness of management action in dealing with risk.
- **Increase risk awareness:** To create an organisational culture where all managerial decisions incorporate risk awareness and all employees are conversant in the effective handling of risks in their organisational areas.
- **Control risk environment:** To limit the probability and potential severity of possible losses and ensure adequate financial protection against possible losses. To establish organisational awareness to effectively deal with significant risks. To reduce the total cost of risk[28].
- **Operate within risk appetite level:** To enhance the probability of achieving organisational goals.

[27] Stulz, R. 1996. Rethinking Risk Management. *Journal of Applied Corporate Finance*. Fall:8-24.
[28] The cost of risk is the sum of insurance costs, un-reimbursed losses, risk control and prevention cost and administrative costs (Valsamakis *et al*., 2000:171).

2.6 DEFINING RISK MANAGEMENT

One of the originating causes in the development of present-day risk management can be attributed to the evolution of the managerial discipline, into a professional function (Valsamakis *et al*., 2000:18).

Every organisation faces unforeseen circumstances that can adversely impact on its operations, reputation and ultimately its continuity. Although these negative events may never realise, the organisation should provide for contingency plans to reduce the severity and variability, if and when the losses do realise (Hollman & Forrest, 1991:49; and Valsamakis *et al*., 2000:18-19). The management of risk and uncertainty is important for organisations as these two interconnected elements result in a cost known as ‘the cost of risk’, that is exerted because of the presence of uncertainty. The cost of risk can be categorised as:

- The cost of the loss.
- The cost of the uncertainty reflected in e.g. the misallocation of resources.

Risk and uncertainty by nature do not focus solely on negative events, but also create opportunities. Organisations would therefore seek to manage their affairs in order to obtain maximum value from these events. The way in which organisations address and manage these risks and uncertainties to reduce the probability of the event occurring as well as limit the adverse effect once the events occurred, is commonly referred to as ‘risk management’. The risk management process is universal in its application, and may involve both individuals and organisations. It is practised by organisations because of its incentives to reduce the cost of risk and uncertainty, while striving to obtain maximum value (Hollman & Forrest, 1991:49; Williams *et al*., 1998:14-15; and Valsamakis *et al*., 1996:54-56).

Traditionalists regard risk management as a discipline centred purely on the management of pure risks (Valsamakis *et al*., 1996:54-56). Kloman

(1987[29]) cited by Valsamakis *et al*. (2000:18-19) and Williams *et al*. (1998:26-27), urge that a differentiation between pure and speculative risks impedes on the development of an integrated view of this discipline. Risk management should encompass all aspects of risks, both pure and speculative (Robinson & Kunath, 1981[30] cited by Valsamakis *et al*., 1996:54-56; 2000:18-19), eliminating, reducing or controlling risks and securing the value from opportunities presented (Andersen & Terp, 2006:31).

According to Truslow (2003:Online), risks should be viewed as the level of uncertainty surrounding an outcome, as this uncertainty creates volatility in an organisation's income stream. Truslow (2003:Online), defines risk management as follows: "Risk management … encompasses the actions we take to minimize the uncertainty of our expected results and to reduce volatility". This concept is also reflected by Cummins *et al*. (1998:30), who states that: "Risk management can be roughly defined as any set of actions taken by individuals or corporations in an effort to alter the risk arising from their primary lines of business".

Briers (2000:8) defines risk management as: "The process of intervention in economic and behavioural risk dynamics so that the value of the organisation is enhanced". The managerial nature of risk management, in terms of which efforts are focused on assisting organisations in achieving their goals and objectives in an effective and efficient manner, is further echoed by Williams *et al*. (1998:26-27), who defines risk management as: "… a general management function that seeks to assess and address the causes and effects of uncertainty and risk on an organisation".

The managerial nature of risk management reflected in the planning, coordinating and directing of risk control and financing is incorporated in the definition of risk management by Valsamakis *et al*. (2000:22) namely:

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[29] Refer to footnote 9.
[30] Robinson, R. & Kunath, L. 1981. A dynamic approach to risk management. *Risk Management*, September.

"Risk management is a managerial function aimed at protecting the organisation, its people, assets and profits, against the physical and financial consequences of event risk". Implicit in this definition is the strategic nature of risk decisions, the inclusion of people and processes in the risk activities, and the proactive nature of this discipline. Although perceived as a simple construct, risk management is a complex process incorporating a diversity of measurement systems and potential outcomes (Ritchie & Brindley, 2007:305-306).

2.7 DRIVERS OF OPERATIONAL RISK MANAGEMENT

The realisation of operational or business risks can lead to material damages and losses to an organisation. The first step in the establishment of a formal risk management function is therefore the identification of risk drivers in an organisation. By identifying the risk drivers, organisations can gain a better understanding of the risk influencing factors, thereby assisting management in developing a risk management strategy (Young, 2006:46-47).

The main drivers of business risk/operational risk (Young, 2006:46) are depicted in Figure 2.2 and can be categorised as:

- Management drivers,
- external drivers, and
- internal drivers.

External drivers impacting on an organisation originate from other organisations and sources that can manifest itself through, for example, regulatory requirements, market events and competition. Internal drivers arise from the execution of organisational activities and processes performed to manage the organisation effectively.

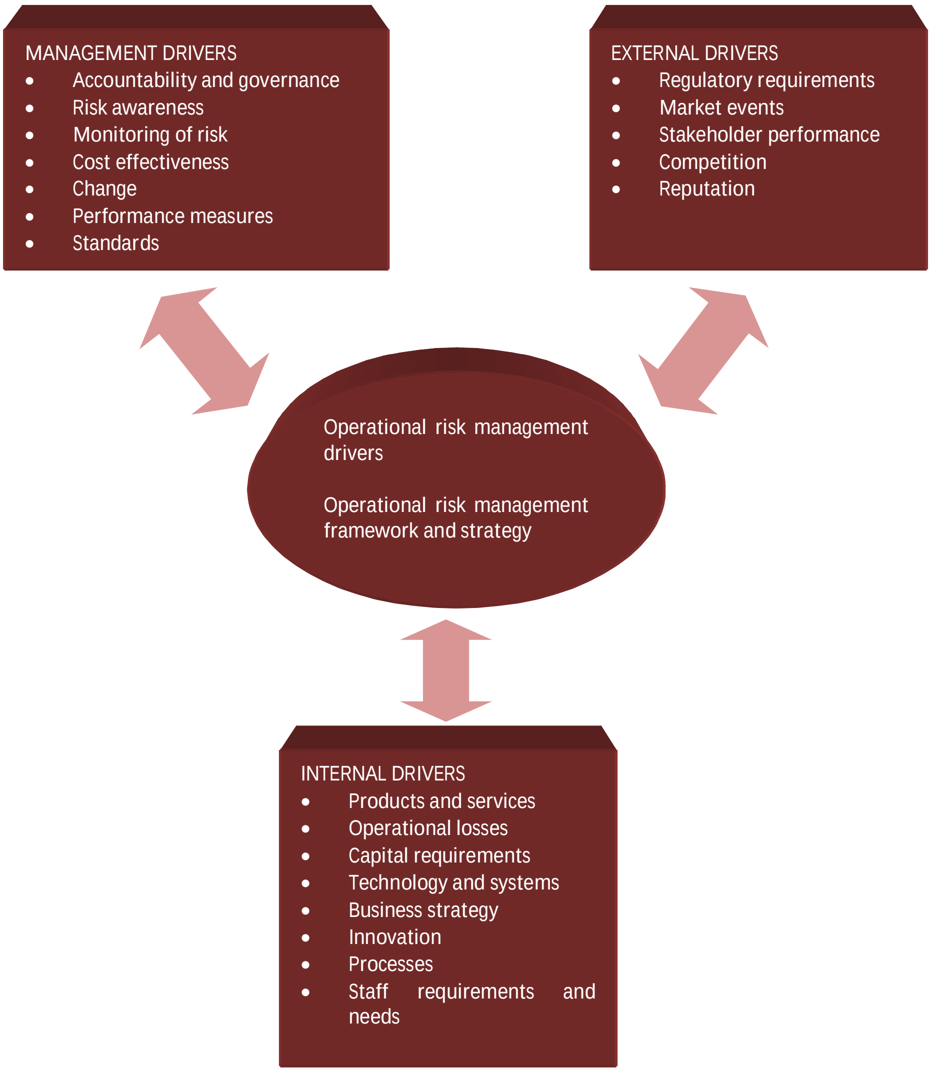

Figure 2.2: Main drivers of operational/business risk (**Source**: Young, 2006:46).

The third major business risk driver is the management driver that emphasises the importance of business risk management through mechanisms such as performance measures, governance and accountability. By creating more risk awareness throughout all levels of an organisation, management can improve the manner in which the organisation operates. Through its risk awareness actions, management can create a positive control environment in which business risks can be identified and managed, opportunities harvested, and the organisational process realigned to improve risk management (Young, 2006:46-47).

Organisations should be aware that implementing risk management activities is a time-consuming activity, especially when the process is not seen as a value-adding activity in terms of the profits of the organisation. The management of business risk should be introduced into an organisation systematically, and management's support and buy-in should be gained through the progression of the process (Young, 2006:46-47).

2.8 REQUIREMENTS FOR EFFECTIVE RISK MANAGEMENT

Organisational processes, systems and governance are all important aspects of risk management. Another influencing factor is the culture of an organisation, comprising the following elements (Truslow, 2003:Online):

- Organisational activities should be based on informed, calculated and structured decisions.
- Consistent long-term growth with low volatility should be strived for.
- In the organisational hierarchy of importance are firstly, soundness, then profitability and then growth.

In addition, an organisational structure should be established for allocating risk management responsibilities. Furthermore, comprehensive risk policies and processes should be developed and implemented in controlling risk. Control over the processes should be exercised through regular supervision by an independent group. With the growing realisation of the importance of risk management, management should allocate this independent oversight role to internal audit. However, good corporate governance practices advocate the use of a separate risk management function for risk oversight. Internal audit's role is to provide management and the board with independent assurance regarding adequacy of the risk functions, and the degree by which organisational objectives are achieved (Young, 2006:34).

Unexpected problems culminating in adverse risk situations would make significant demands on an organisations' money, time and resources, and may cause reputational damage. Conversely, the absence of such problems enables organisations to utilise their resources more effectively. Sound risk management therefore provides a competitive advantage over time by providing flexibility to the organisation in capital investment decisions (Truslow, 2003:Online).

2.9 APPROACHES TO THE ESTABLISHMENT OF A RISK MANAGEMENT FUNCTION

In establishing a business risk management function, organisations can use a 'top-down' or a 'bottom-up' approach (Young, 2006:47-48; and Pickford, 2001:54). These two approaches are elaborated upon below.

2.9.1 The top-down approach

The top-down risk mapping approach addresses risk from a corporate perspective, by identifying and analysing existing risks in each part of the organisation, taking into account the interconnectedness of risk in terms of each other and the organisation as a whole (Pickford, 2001:54). On a generic level, the process as a rule would be initiated by the board of directors when they agree on the need for the implementation of a risk management function. Managerial activities in setting up this process will include the formulation of a business risk definition; defining business risk categories; allocating initial responsibilities for the development and implementation of the risk process and obtaining management support for the process (Young, 2006:47-48). According to Pickford (2001:54), the risk mapping approach comprises the following subprocesses:

- **Risk identification:** Risks that affect the organisation as a whole are identified, through e.g. the use of publicly available information. These risks are communicated to key employees, who by way of brainstorming sessions are then tasked to identify internal organisational risks.
- **Risk evaluation:** The results of the risk identification activities are then analysed in terms of probability and impact, which is usually

depicted by means of matrices representing the different levels of probability and impact.

- **Risk profiling:** The results of the risk evaluation are then extrapolated into a risk profile, where risks are grouped into risk categories ranging from high-probability, negligible outcomes to low-probability, high-severity disasters. Risk mitigation priority strategies can then be formulated according to the risk profile information.
- **Risk quantification:** Risk categories can further be analysed through the estimation of actual losses, frequencies and confidence limits. Expert opinions combined with valid loss data can be used in these estimations.
- **Risk consolidation:** Departmental or subsidiary risk analysis should be elevated to a corporate level. This may involve either a mathematical process or a qualified team may be used to perform a subjective risk profiling analysis.

2.9.2 The bottom-up approach

The bottom-up risk approach involves all organisational employees. It is imperative that when risks occur, they are managed as close as possible to the originating source in order to reduce or eliminate the potential adverse effects. As a result, all levels of employees should be involved in the identification and categorising of risks pertaining to their respective responsibilities. In order for management to receive accurate data on which to base their control decisions and resulting control actions, a bottom-up risk approach should be used. However, an interface between the bottom-up and top-down approach should be established in order to secure optimal risk information flow and coordination of activities (Young, 2006:47-48).

Page and Spira (2004a[31]) cited by Fraser and Henry (2007:394), support the use of a bottom-up risk management approach where preliminary risk

[31] Page, M. & Spira, L. 2004a. *The Turnbull Report, Internal Control and Risk Management: The Developing Role of Internal Audit*. ICAS, Edinburgh.

evaluations are performed by junior teams, followed up with risk assessments performed by more senior employees. Alternatively, Control Self-Assessment (CSA) provides for an effective mechanism (e.g. use of questionnaires or workshops) to identify risks, enhancing management's understanding of the process, and gaining their cooperation and involvement (Skinner & Spira, 2003:28-35; and Mustafa & Kennard, 2004[32] cited by Fraser & Henry, 2007:394). The top-down and bottom-up approach to risk management is graphically depicted in Figure 2.3.

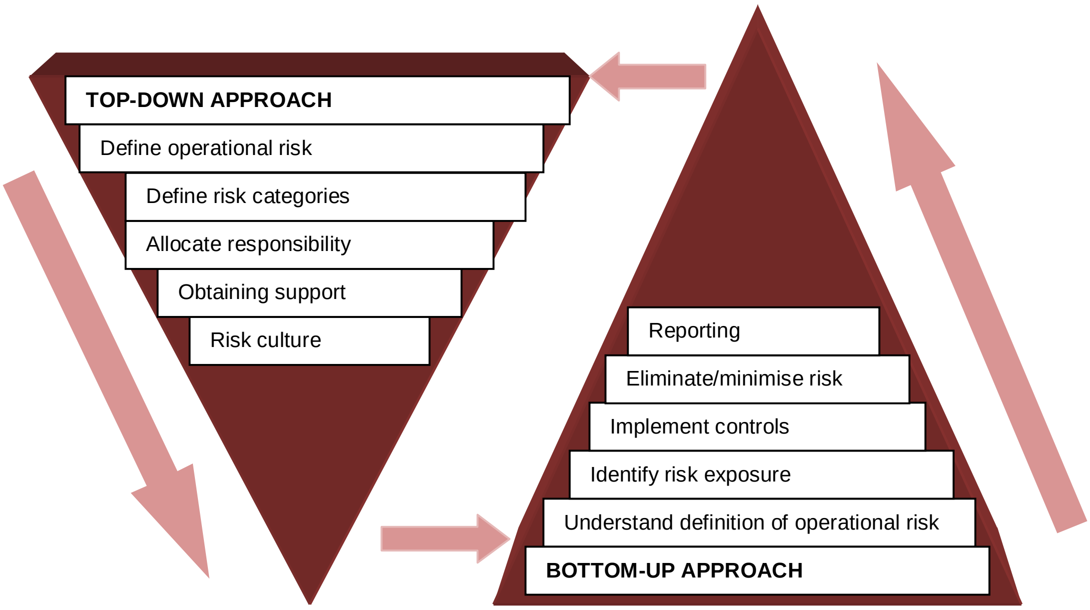

Figure 2.3: Top-down and bottom-up approaches to risk management (**Source**: Young, 2006:48).

2.10 THE RISK MANAGEMENT PROCESS

Any organisation needs to ensure that it has an effective and efficient risk management process in place (Financial Committee of the Institute of Chartered Accountants in England and Wales, 2002:20). Although authors in the field of risk management differ on the exact composition of the elements of the risk management process, there are certain generic steps which are usually considered in this process to provide assurance to

[32] Mustafa, E. & Kennard, P. 2004. The new balancing act. *Internal Auditing and Business Risk*, January:37-40.

management that organisational risks are being effectively managed (DEAT, 2006:Online; and Young, 2006:31-32).

2.10.1 An overview of the risk mapping process

Although the practice of risk management is likely to differ amongst organisations depending on the potential effect of risk on the organisation, the process will usually comprise the following well-established steps (Young, 2006:31-32; Financial Committee of the Institute of Chartered Accountants in England and Wales, 2002:20; Bandyopadhyay *et al*., 1999[33], Tummala & Leung, 1999[34] cited by Kendrick, 2004:70; Crouhy, Galai & Mark, 2006:2; Valsamakis *et al*., 1996:63-64; 2000:25; Andersen & Terp, 2006:34; DEAT, 2006:Online; and Williams *et al*., 1998:30-31):

- **Risk identification:** Identify, rank and source risks in an organisation.
- **Risk assessment:** Select the most appropriate risk management approach using qualitative and quantitative techniques.
- **Risk response:** Implement controls to manage risks.
- **Risk monitoring and reporting:** Monitor the effectiveness of the risk response.

The Financial Committee of the Institute of Chartered Accountants in England and Wales (2002:20), advocates a fifth element of the risk management process, namely ‘organisational learning and effective improvements’. According to Leopoulos, Kirytopoulos and Malandrakis (2006:322), and the DEAT (2006:Online), the risk management process can be extended to incorporate risk planning that precedes the risk identification step. The basic steps of the risk management process are graphically depicted in Figure 2.4.

[33] Bandyopadhyay, K. *et al.* 1999. A framework for integrated risk management in information technology. *Management Decision*, 37(5):437-444.
[34] Tummala, V.M.R. & Leung, Y.H. 1999. Applying a risk management process (RMP) to manage cost risk for an EHV transmission line project. *International Journal of Project Management*, 17(4):223-235.

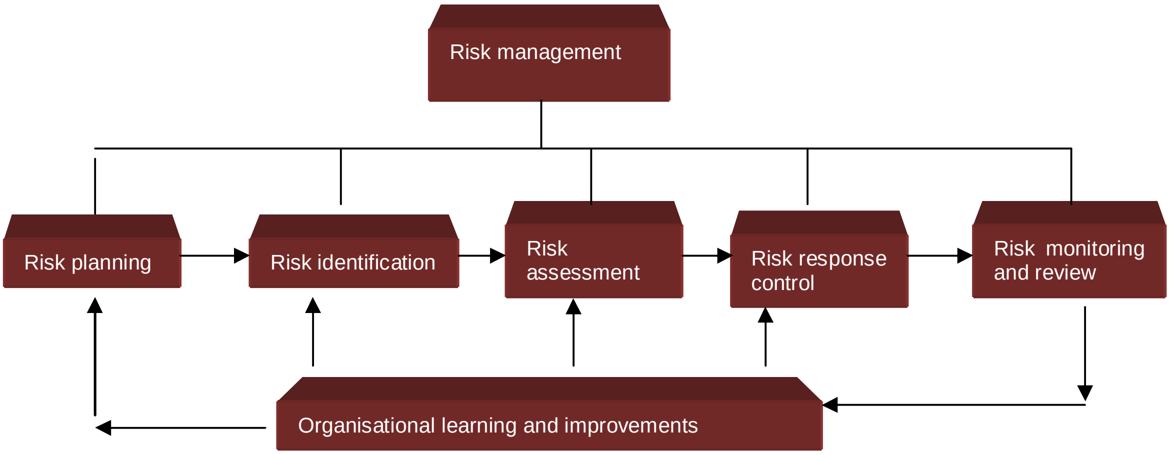

Figure 2.4: The basic risk management process (**Source**: Adapted DEAT, 2006:Online; and Leopoulos *et al*., 2006:323).

Uncontrolled residual risk, remaining after the risk management actions were taken, can cause an organisation significant harm. To manage the residual risk and compensate organisations for incidents that occur, organisations can incorporate a risk financing element into the risk management process. Valsamakis *et al*. (2000:22), makes reference to the financing element by stating that a risk management function 'involves planning, coordinating and directing the risk control and risk financing activities in the organisation' (DEAT, 2006:Online; and Williams *et al*., 1998:30-31). The full risk management process, including the financing element, is depicted in Figure 2.5.

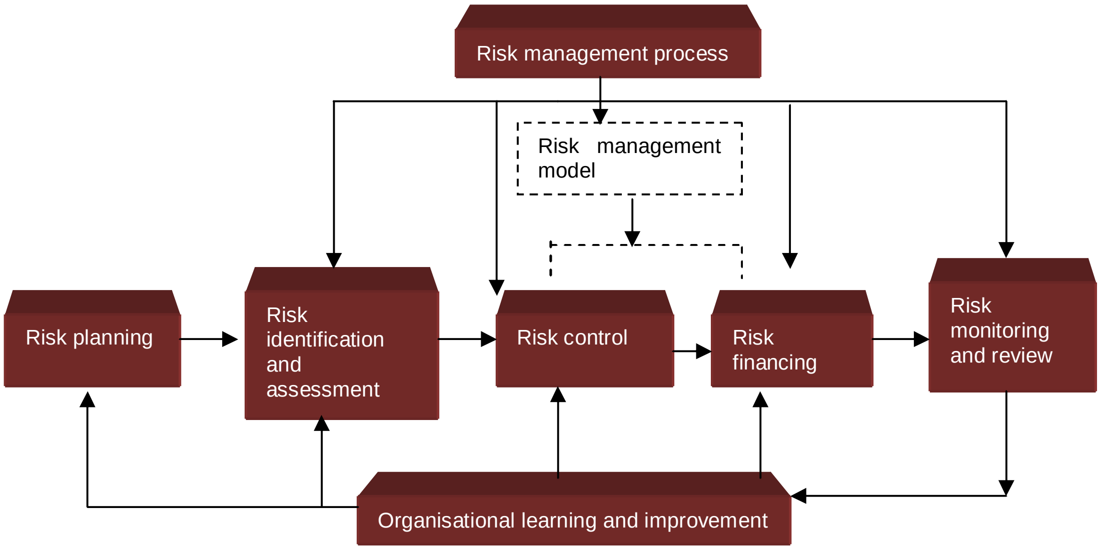

Figure 2.5: The full risk management process (**Source**: Adapted DEAT, 2006:Online; and Leopoulos *et al*., 2006:323).

Although the nature of the risk management elements implies a sequence of events, risk management is not necessarily a sequential process, as any of the elements can influence the risk programme. Furthermore, overlapping can occur amongst the risk management elements (Williams *et al*., 1998:29-30).

Some authors such as Chapman and Ward (1997[35]) cited by Leopoulos *et al*. (2006:323), prefer a more analytical segmentation of the risk management process as opposed to the steps discussed in Figure 2.5. The 'segmental' risk management approach and the basic five-stage approach however, follow the same approach and concepts with the primary difference being the development of the risk management plan stage which guides the implementation of the risk management process (Leopoulos *et al.,* 2006:322-323).

[35] Chapman, C. & Ward, S. 1997. *Project risk management: Processes, Techniques and Insight.* Chichester: John Wiley & Sons.

2.10.2 Risk management planning

Prior to embarking on a risk management process, risk management planning is essential as it serves as a foundation for all risk management activities. A vital element in the planning phase is the establishment of risk management goals and objectives, as these serve as a benchmark against which the success or failure of the programme is measured. Indicative of the goals and objectives, is the risk methodology underpinning the process (Williams *et al*., 1998:30-31).

According to Bowden *et al.* (2001:8), in the planning phase, organisations should define the context and risk management criteria by:

- Defining the organisational environment or context within which the risk assessment will be undertaken.
- Formulating the primary objectives and outcomes required.
- Identifying the criteria against which the risks can be measured.
- Defining the core elements needed to structure the risk identification and measurement process.

2.10.2.1 Defining the organisational context of risk

The objective of defining the organisational context of risk is to ensure that all organisational stakeholders understand their responsibilities and accountabilities, and to identify possible weak areas that may influence the organisation's ability to manage risk. At a minimum, the following should be considered when defining the organisational context of risk (Bowden *et al*., 2001:8-11):

- Organisational operations/activities.
- Organisational policies, goals and objectives.
- Measurable performance objectives.
- Defining all stakeholders involved.
- The ability of the organisation to exert control over its business risk, stakeholder requirements, legal considerations and financial aspects.

Various methods can be used and sources consulted in gathering such information, e.g. review of strategic and operational documents, analysing organisational charts to determine management responsibilities, interviews with stakeholders and researching best practices in industry. Organisations should act with care when addressing stakeholder concerns, as they themselves could introduce business risks by having different organisational expectations than envisaged by management. As stakeholders represent a broad range of the community, i.e. employees, customers, suppliers, authorities, community, government and special interest groups, their organisational expectations by implication are diverse. It is therefore imperative that an analysis of stakeholder interest should determine the type of stakeholders, their concerns and their influence over organisational activities. Stakeholder expectations are a dynamic organisational influence, which may react to any stimulus by the organisation, industry, ethical and other considerations (Bowden *et al*., 2001:8-11).

2.10.2.2 Objectives and outcomes

Departmental, process and project performance objectives are dependent on the organisational objectives and the phase of the project cycle or organisational activity. The following serves as example (Bowden *et al*., 2001:11):

- During the planning stage of a project or process, the requirements usually mirror the corporate policy expectations.
- In the design phase, the focus is more directed at technology criteria and stakeholder acceptance.
- During the delivery, operational and marketing stages, the attention is directed at specific criteria such as cost control, time schedule control and performance quality control.

2.10.2.3 Identifying the risk criteria

Risk assessment activities comprise comparing the forecast levels of risk against predetermined risk management performance targets in order to determine the risk actions. Where circumstances deem practical, these criteria should be defined when establishing the risk management context and reviewed when the risk evaluation outcomes are available (Bowden *et al*., 2001:11).

2.10.2.4 Scoping the risk identification and assessment process

When executing a programme of risk evaluation and strategy development, organisations should ensure that inadequate resources (e.g. lack of time, finances, etc), do not adversely impact on the process results. Frequently, issues are not timely addressed resulting in organisations taking on risk that they otherwise would not have engaged in, if they had a better understanding of the possible consequences. The importance of scoping during risk identification and evaluation process would ensure that the risk analysis is adequately focused (Bowden *et al*., 2001:12).

2.10.3 Identification of risk

The second phase of the risk management process is risk identification, as risks cannot be managed if they are not identified (Valsamakis *et al*., 2000:81; and Young, 2006:33). This forms the foundation for the next steps of risk analysis and control, and enables organisations to learn of the areas in which it is exposed to risk. Adequately executed risk identification ensures effective risk management as unidentified sources of losses escalate into unmanageable events with unexpected outcomes (Williams *et al*., 1998:64-66; Green & Trieschmann, 1984[36] cited by Tchankova, 2002:290). The focus is not only directed at the inability to

[36] Green, M.R. & Trieschmann, J.S. 1984. *Risk and Insurance*. Cincinnati: South-Western Publishing.

identify loss causing risks, but also includes the inability to identify opportunistic events. The effect of the non-identification of positive risks equates to the effect of non-identification of negative risks (Dickson & Hastings, 1989[37] cited by Tchankova, 2002:291). Risk identification entails the identification of all possible organisational risks and opportunities, as well as the conditions giving rise to these risks and opportunities. Risk identification therefore facilitates the effective studying of areas and activities where organisational resources are at risk, affecting their ability to achieve their business goals (Williams *et al*., 1998:64-80; Tchankova, 2002:291; and McNamee, 1998:29).

According to Valsamakis *et al*. (1996:87-88; 2000:25-26), risk identification should be regarded as the single most important activity of the risk management process, and should be approached in a systematic way. Risk identification techniques are designed to gather information on:

- **The sources of risk:** Elements of the organisational environment with possible positive or negative outcomes, e.g. market conditions. The objective of risk identification is the identification of all types of risk. Possible sources of risk according to Williams *et al.* (1998:66-68) and Tchankova (2002:293-295), should therefore be broadly construed to include:
  - The physical environment, e.g. weather.
  - The social environment, e.g. human values.
  - The political environment, e.g. influences on monetary policies.
  - The legal environment, e.g. inconsistency due to different legal standards.
  - The operational environment, e.g. manufacturing activities may harm employees.
  - The economic environment, e.g. inflation, interest rates.
  - The cognitive environment, e.g. what is perceived and what actually exist.

[37] Dickson, G.C.A. & Hastings, W.J. 1989. *Corporate Risk Management*. London: Witherby & Co.

- **Hazards/risk factors:** Conditions that increase the probability of a loss or its impact and that arise in one or several environments, e.g. incorrect market expectations forecast by management may increase the probability of a loss.
- **Perils:** The cause of the loss, e.g. a fire in a warehouse. A characteristic of a peril is that it only has a negative connotation (Hance *et al*., 1991[38] cited by Tchankova, 2002:292).
- **Exposures to risk:** Objectives/circumstances that may be affected by a possible loss or gain (Williams *et al*., 1998:30-31,64-66; and Tchankova, 2002:292).

Organisational exposures are identified during the risk identification phase. Several formalised methods are available to organisations, and are usually used in combination to identify the broad organisational risk environment. The first step is evaluating the organisational processes to determine the method by which the organisation achieves its overall objectives, and what influences can prevent the organisation from achieving these objectives. In conjunction with this activity, the past organisational and community experiences are assessed while attempting to project new organisational exposures that will arise in the future due to changes in the environment, e.g. legislative, market, and economic changes. The degree of exposure will vary in that some exposures could have catastrophic effects on an organisation, but is highly unlikely to occur. In comparison, other exposures might have a relative insignificant effect on the organisation, but may occur frequently (Andersen & Terp, 2006:34-36).

A systematic risk identification approach (Valsamakis *et al*., 2000:25), is achieved by considering the organisation's risks in the macro- and microorganisational environments. Macro risk identification concerns the identification of significant risk sources, which may have severe adverse financial implications for the organisation. Micro risk identification is pivotal to physical risk management, as it identifies subsources of risks

[38] Hance, B.J., Caron, C. & Sandman, P.M. 1991. *Industry Risk Communication Manual.* Boca Raton: Lewis Publishers.

within the main risk areas. According to Valsamakis *et al*. (2000:36-38), macro risk identification comprises three categories in the corporate environment, namely:

- **Inherent business risks:** This includes all the organisational activities, decisions and events, which impact on the earning levels of the organisation. These risks are inherent to the main business of the organisation and cause fluctuations in the earnings of the organisation. Two categories of inherent risks can be defined, namely:
  - **Unsystematic risk:** Unsystematic or specific risk is tied to the organisation and unrelated to the rest of the economy.
  - **Systematic risk:** Systematic or market risk stems from events, which influence the economy as a whole.

  Various methods can be used to identify possible risks, namely (McNamee, 1998:34-35):
  - Analogies to similar activities.
  - History of the activity.
  - Industry surveys centred on the critical issues.
- **Incidental risks:** These risks flow naturally from organisational activities, but are regarded as incidental as they do not form part of the primary business of the organisation. However, they are regarded as necessary to ensure business continuity.
- **Event (pure) risks:** Are non-speculative risks with only a downside potential. They can usually be attributed to specific events and are traditionally, insurable.

McNamee (1998:29), employ a different methodology in the approach to risk identification, namely an exposure analysis, an environmental analysis, and a threat scenario approach:

Exposure analysis: In the exposure approach, the focus is directed at assets since they are exposed to risk in achieving organisational objectives. This approach works best in processes that are mainly dependent on their assets for achieving their goals, for example manufacturing activities and inventory processes. Consideration is given to these asset attributes, namely asset size, asset type, asset portability and asset location. Assets include:

- Tangible assets, e.g. machinery and buildings.
- Financial assets, e.g. cash and investments.
- Human assets, e.g. employee experience.
- Intangible assets, e.g. reputation, information.

In the exposure approach, threats and risks are investigated that may have a material impact on the assets (McNamee, 1998:29-30).

Environmental analysis: Organisations exist in an external environment that consists of various subenvironments, where both current and future activities may hold risks and threats, which may impact on the achievement of organisational goals. These subenvironments are:

- The physical environment, e.g. weather, location.
- The economic environment, e.g. inflation, interest rates.
- The governmental environment, e.g. existing and proposed laws, regulations.
- The competition, e.g. direct and indirect competition.
- Customers.
- Suppliers, which includes unions.
- Technology.

The environmental approach is best suited for service-orientated processes and processes that are highly regulated or competitive, e.g. sales functions, customer service processes, internal service functions such as accounting, etc. All organisations are exposed to some or other level of environmental risks. The environmental analysis is a highly subjective process as ‘speculation’ is generated on the current state of the environments, and how they may change in the future. This ‘speculation’ is multidimensional, as it considers various inputs and should be done in collaboration with management (McNamee, 1998:30-32).

Threat scenarios: This approach is best suited to situations of fraud or security issues, and require a specialist to facilitate the process. Threat scenarios are bound to certain time periods, since the consequences of threats change over time. Threat scenarios may be for specific times such as hours, or forecast for short-, medium- or long-term scenarios. Short time threats are categorised as errors, omissions, delays and fraud. The threat scenario process consists of documenting the asset subjected to the risk, the specific threat, consequences of the threat, and methods the threat is usually realised by. Thereafter, attention is given to controls to mitigate or eliminate the risks (McNamee, 1998:32-33).

In selecting the optimum approach, cognisance should be taken of the nature of the organisation. More often than not, risk identification is executed by using all three approaches, where one approach is the primary method and the other two approaches ensure the whole spectrum of risks are covered, to provide a complete perspective for planning purposes.

Bowden *et al*. (2001:12), proclaim the use of a three-element risk identification process, namely:

- Identification of risk events.
- Estimation of the probability of the occurrence.
- Description of the consequences of the realised events.

This process involves the formulation of a comprehensive list of risk events that may impact all organisational activities. The estimated probability and consequences of the risks are evaluated, taking cognisance of the effectiveness of current controls or future anticipated controls that may influence the risk.

Various sources of information and methods may be utilised during the risk identification phase, which amongst others, may include:

- Scenario brainstorming.
- Industry benchmarking.
- Expert judgements from the project team, internal advisors and external advisors pertaining to commercial or technical issues.
- Analysis of past, present and projected future operations.

- Document assessments, e.g. contracts, technical manuals, etc.
- Analysis of historic losses.
- Analysis of operating reports and financial statements.
- Internally created survey or checklist.
- A schematic depiction of organisational activities and interrelationship to all stakeholders (Bowden *et al*., 2001:12-13; Hollman & Forrest, 1991:51-53; Andersen & Terp, 2006:24-36; Chapman, 2001:147-160; and DEAT, 2006:Online).

Qualitative and quantitative risk identification techniques are used in the risk identification process. It is of importance to note that these techniques are not necessarily used in isolation, and may be used in a combination approach to achieve optimum benefits from both approaches (Leopoulos *et al*., 2006:323). Sophisticated techniques such as knowledge management systems may be used to assist management in the risk identification process (Kirytopoulos *et al*., 2001b[39] cited by Leopoulos *et al*., 2006:323). Knowledge management tools include the development and maintenance of risk history registers, which store the risk history of the organisation to be used in the forecasting of future projects. It is of importance that attention is directed not only at the maintenance of such risk databases, but also to ensue that continuous scrutiny is directed at opportunities to enhance this register (Nonaka & Takeuchi, 1995[40] cited by Leopoulos *et al*., 2006:323). All risks identified using the abovementioned methods should be communicated to the designated individuals for analysis and evaluation (Leopoulos *et al*., 2006:323).

Other sophisticated techniques (White, 1995:36-41), which may be used in risk identification include:

- **Failure Mode and Effects Analysis (FMEA):** FMEA represents a structured brainstorming session to identify possible problems, which

[39] Kirytopoulos, K., Leopoulos,V., Malandrakis, C. & Tatsiopoulos, I. 2001b. Innovative knowledge system for project risk management. *Advances in Systems Science* (WSES Press):505-510.
[40] Nonaka, I. & Takeuchi, H. 1995. *The Knowledge Creating Company*. Oxford: Oxford University Press.

may occur in a process or system. The concept behind FMEA is that each process and system can be broken down into parts and analysed.

- **Fault Tree Analysis (FTA) and Event Tree Analysis (ETA):** FTA and ETA are systematic methods to identify the originating cause of a specific condition and the consequences forthcoming from an event. The underlying premise of FTA and ETA is that events are mutually exclusive and therefore do not identify common mode or failures.
- **Hazard and Operability Study (HAZOP):** It is a brainstorming technique used to identify risks pertaining to specific components. The major criticism levied against this method is the failure to address interdependencies between elements.
- **Cost Benefit Analysis (CBA)** and **Risk Benefit Analysis (RBA):** CBA is founded on the principle that alternatives can be selected by comparing the benefits and disadvantages of each choice. It is a method for estimating and quantifying risk. The concepts underpinning RBA is that expected benefits from a choice are balanced against the expected risks. It is assumed that organisations are prepared to undertake increasing risk but only when the expected benefits increase proportionately.
- **Human Reliability Analysis (HRA):** HRA is a technique used to identify events where human interactions may lead to potential failure.
- **Sensitivity Analysis (SA):** SA is based on grading the significance of future effect scenarios ('what if' questions). Criticism of this technique is that it leads to over-simplification of problems and the exclusion of many considerations.
- **Hertz type simulation:** This computer simulation model analyse scenarios, where key variables simultaneously impact on a situation.
- **Monte Carlo simulation:** The Monte Carlo simulation technique allocates values to variables on the basis of their probability of occurrence.

- **Risk perception techniques:** Historical data is projected on future choices. However, time influences on behavioural changes are not taken into account.
- **Delphi method:** This technique aggregates expert opinions.
- **Expert system:** This technique uses artificial intelligence to emulate an expert's reasoning process.

Most of the abovementioned techniques are based on dividing a process into its elementary components for analysis. This reductionist view fails to consider the interactions between components and new risks that may arise as a result of the interaction with the internal and external environment (White, 1995:41).

Risk discovery contemplates all exposures, including direct losses such as the need to replace stolen property and indirect losses such as loss of key employees through death or retirement (Hollman & Forrest, 1991:51-53). Risk identification is not a static process, but should be the focus of continued evolution. Changes in the environment due to the macroeconomic frame, changes in the political dispensation, social changes etc, require continuous identification of new risks. The identification of risks is therefore not only limited to existing risks impacting the organisation at present, but also anticipated new risks that the organisation may encounter in the future (Williams *et al*., 1998:64-66; and Tchankova, 2002:293). For each identified risk, the following should be captured in a key risk register (Bowden *et al*., 2001:13):

- A brief description of the risk identified.
- The various possible causes of the risk and the consequences if realised.
- The main organisational area where the risk may occur.
- The critical success factors that may be affected if the risk does realise.
- An evaluation of the probability of occurrence and the expected impact.
- The department/person responsible for managing the risk.

It is important to acknowledge that no single risk identification method is sufficient to identify all risks. A combination of methods is therefore proposed to ensure that the identification is as encompassing as possible. Furthermore, the various risk identification methods have been developed in response to industry-specific problems with certain methods more suitable for some industries than others. From the above the analogy can be drawn that risk identification should not be undertaken in isolation, but as a consultative approach with involvement from as many people as possible (Valsamakis *et al*., 1996:99-100; 2000:92).

2.10.4 Risk assessment activities

Risk identification is followed by risk assessment and analysis. It does not suffice to focus only on identifying hazards, risk factors and exposures. Equally important is the process of gaining an understanding of the nature of these events, their causality, and the process whereby they create a loss or gain. Virtual risks, i.e. perceptions of risks and uncertainty, should also be analysed since these may have a profound impact on the management of an organisation. Risk measurement represents a systematic process that evaluates the probability of event occurrence and the value of a loss or gain on a two-axis matrix of frequency and impact by way of qualitative or quantitative techniques (Williams *et al*., 1998:30-31; Pickford, 2001:55; and DEAT, 2006:Online). When determining the financial effect or consequence of an event, the indirect effects should also be determined as these may be significant (Williams *et al*., 1998:77). Deshotels (1995)[41] cited by DEAT (2006:Online), states that the concept of risk is complicated due to the narrow focus of the society on event consequences without considering the probability of the event. The purpose of these risk assessment activities is to classify risks in prioritised groups aiding in the development of a risk management strategy (Bowden *et al*., 2001:13-14). Any risk management system must have the capability to assess and manage risk; therefore a risk measurement methodology

[41] Deshotels, R. & Zimmerman, R.D. 1995. *Cost Effective Risk Assessment for Process Design*. New York: McGraw-Hill.

should be formulated to allow comparisons to be made between the different types of risk (Young, 2006:33).

According to Valsamakis *et al*. (2000:26), risk evaluation and assessment, together with risk identification, provide the foundation for risk management actions and are therefore the most important steps in the risk management process. It is of importance to note that in practice, the risk identification phase and the risk measurement phase are to a certain extent, likely to occur simultaneously, as a level of risk importance must be reached before attention is directed at the management of a particular risk.

2.10.4.1 Risk assessment guidelines

Before any risk is assessed, the nature and scope of the risk should be determined. Olsson (2002[42]) cited by DEAT (2006:Online), suggests that the following risk characteristic be determined:

- The duration of the risk, i.e. time.
- The probable size of the risk, i.e. exposure.
- The probability of the risk occurring, i.e. probability.
- The degree of variance between the risk outcome and the expected outcome, i.e. volatility.
- The difficulty in understanding the risk, i.e. complexity.
- The types of risks involved, i.e. interrelationships.
- The controllability of the risk, i.e. influence.
- The cost of addressing the risk and the benefits gained from such actions, i.e. cost-effectiveness.
- The consistency of the risk over time, i.e. life cycle.

It is essential that clear guidelines are established for the risk assessment process, to ensure that adequate measuring of risks is achieved throughout an organisation. The following principles should be adhered to (Young, 2006:66):

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[42] Olsson, C. 2002. *Risk Management in Emerging Markets*. Harlow: Prentice Hall.

- **Reliability:** To achieve accurate risk measurement, the information should be validated.
- **Auditable:** The risk identification and assessment process must be auditable in order to assure management that the use of information was indeed objective and accurate.
- **Objectivity:** Risks should be measured by using standardised and objective criteria.
- **Consistency:** Risk data should be applied and used in a consistent way to facilitate comparisons between different departments, business areas, etc.
- **Relevance:** The data used to identify risk should be relevant to the organisation, therefore allowing management to make accurate decisions based on the risk measurement.
- **Transparency:** Risk reporting and assessment should be done in a way that encourages transparency.
- **Completeness:** All material risks should be identified and processed.

2.10.4.2 Risk assessment process

Risk assessment can be performed at various organisational levels (DEAT, 2006:Online), namely:

- At a **strategic level**, where the results of the assessment can alter the organisation's focus or business direction.
- At a **group or macro level**, where the results of the assessment can influence the nature or activities of the organisation.
- At a **micro or operational level**, where the results of the assessment can change the working methods or the process.

The risk assessment process is initiated by the gathering of additional information from sources such as audit reports, budget plans, and discussions with management, to perform a complete evaluation of all significant risks impacting on the organisation. These risks would have been identified during the risk identification phase, but are updated and verified during these information gathering sessions, especially in circumstances where there was a change in the business or operating environment (Young, 2006:57-68).

The process of risk assessment includes both simplex and complex methods. Simplistic techniques such as an educated guess or gut-feel of management or in-house experts should not be underestimated, and the use of sophisticated techniques like a Monte Carlo simulation, should not be overestimated (Andersen & Terp, 2006:36-37). Various sophisticated techniques such as 'fuzzy sets' and 'neural networks' exist, however due to their complexity are not likely to be adopted for use by the industry and especially SMEs (Carr & Tah, 2001[43] cited by Leopoulos *et al*., 2006:323). Organisations should determine the level of sophistication that will provide them with appropriate information for decision-making purposes. Further prerequisites for successful risk assessment are management's support, adequate time and adequate resources. Various risk assessment techniques may be applied simultaneously depending on the circumstances of the organisation, while a risk assessment workplan should follow a rigorous methodology to analyse risk. It is essential that organisations define the methodology they intend using before the commencement of the risk assessment phase. Organisations should however take cognisance of the fact that whatever methodology they intend using, is founded on data, analytical procedures and recommendations based on human judgements by specialists and non-specialists alike. This necessitates the importance of ongoing risk monitoring, and a repetitive risk assessment activity (Andersen & Terp, 2006:36-37).

According to Baker *et al*. (1999:98-99), risk analysis techniques are usually grouped into qualitative and quantitative techniques. A qualitative technique is an assessment expressed in relative terms pertaining to the

[43] Carr, V. & Tah, J. 2001. A fuzzy approach to construction project risk assessment and analysis: construction project risk management system. *Advance Engineering Software*, 32:847-857.

risk effect and frequency, e.g. high risk versus medium or low risk, and is a subjective technique dependent on various variables such as the analyst's experience. Techniques used vary according to industry, but some regularly used methods include personal and corporate experience, judgement and brainstorming. Medium or high risk events identified through qualitative analysis, should be subject to quantitative assessment and scrutiny. Quantitative techniques provide numerical probabilities of consequence and frequency, that are usually based on mathematical or computer models modifying the results obtained from qualitative analysis. Quantitative analysis draws on values derived from historical databases or estimated values, which incorporate elements of subjectivity. Quantitative techniques used include according to Hyatt, 2003[44] cited by DEAT (2006:Online) and Baker *et al*. (1999:98-99), expected net present value, algorithms, decision matrixes, decision trees, break-even analysis, fault tree analysis and simulation. In a survey conducted by Baker *et al*. (1999:98-99), the majority of respondents agreed with the generally accepted approach that qualitative and quantitative techniques complement each other and are best use in a combination approach, one after the other. A small minority i.e. 20% of respondents preferred the sole use of qualitative methods, probably because of insufficient data available for quantitative use.

To minimise the bias that is associated with qualitative (subjective) assessments, the following methods can be applied (Williams *et al*., 1998:79-80):

- **Statistical measurement:** The use of observable facts and data to substantiate subjective estimates facilitates the use of statistical processes to measure the subjective risks.
- **Pattern or profile measurement:** Subjective risks are classified in accordance with the aggregate risk pattern of the activity/department in relation to established risk standards. As a result, subjective risks

[44] Hyatt, N. 2003. *Guidelines for Process Hazard Analysis*. *Hazards Identification and Risk Analysis 3rd Edition*. Canada: Dyadem Press.

are measured by comparing the overall risk pattern against similar activities, with similar characteristics, and similar judgements.

- **Peer activities:** Group decision tools such as the Delphi technique can be used to group the experience and intuition of a larger group of experts, whereafter consensus is reached based on their expertise. These group decision tools attempt to eliminate personal bias.

Not all risks exposures are equally important to an organisation, and as a result there is a need to prioritise risks so as to direct managerial focus at the more significant risks requiring mitigation. The prioritisation process is diagnostic in nature and entails the measuring of the risk dimension of each exposure by determining the potential impact or consequence of the exposure and the probability of occurrence (White, 1995:35-36; Wideman, 1992[45] cited by Leopoulos *et al*., 2006:323; Baccarini & Archer, 2001[46] cited by Leopoulos *et al*., 2006:323; Andersen & Terp, 2006:36-37; and Hollman & Forrest, 1991:53). Loss frequency or loss probability is the measure of the number of loss events, which occur within a defined period (Valsamakis *et al*., 1996:107-109). Both the term's probability and consequence are often described by other terms. The following terms tabulated in Table 2.2 below as described by Bennett (2005)[47] cited by DEAT (2006:Online), are used interchangeably depending on the information available for use.

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[45] Wideman, R.M. 1992. *Project and Program Risk Management: A Guide to Managing Project Risk and Opportunities*. Pennsylvania: PMI.
[46] Baccarini, D. & Archer, R. 2001. The risk ranking of projects: a methodology. *International Journal of Project Management,* 19:139-145.
[47] Bennett, L.G. 2005. Understanding Risk Assessment. *National Safety and Occupational Hygiene Journal*, 65(2), March/April.

Table 2.2: The interchangeability of various terms (**Source**: Bennett, 2005 cited by DEAT, 2006:Online).

OCCURRENCE DESCRIPTION	**TERM USED**	**VALUE EXAMPLE**
How often function	Likelihood	Regularly, annually
	Frequency	3 x per year
	Probability	1 in 50 chance
How severe function	Consequence	In R, $, £, injury
	Severity	In R, $, £, injury
	Impact	In R, $, £, injury
How long function	Exposure	Hours, days, years

If a two-dimension risk matrix is used, risk at the assessment stage according to DEAT (2006:Online) can be described as follows:

Risk= likelihood x consequence OR Risk= likelihood x severity
Risk= frequency x consequence OR Risk=frequency x severity
Risk= probability x consequence OR Risk=probability x severity

However, risk can be assessed three-dimensionally where the probability of occurrence is conditional on an exposure dimension in time. By incorporating the exposure element, the risk formula according to DEAT (2006:Online) is adapted to the following:

Risk = Likelihood x Exposure x Consequence

More specific, the risk evaluation process comprises identifying all risk exposures, determining the possible probability of occurrence, as well as the possible consequences of each identified risk and assigning a value to the determined levels. Numerical values are usually assigned for each of the probability levels and consequence levels e.g. 1 = extremely low, 2 = low, 3 = medium, 4 = high and 5 = very high. Once these values are imported into the risk formula, the calculated scores become a risk rating value. Provided the consistent application of these values, the risk score for each identified risk can be compared and risks prioritised. A risk matrix (refer to Table 2.3), can be compiled to graphically depict the risk rating for a two-element risk formula with the axis representing risk consequence and risk probability (DEAT, 2006:Online).

Table 2.3: A risk evaluation matrix table scoring 2 functions (**Source**: DEAT, 2006:Online).

CONSEQUENCE/SEVERITY	5 Extreme	5	10	15	20	25
	4 Very Severe	4	8	12	16	20
	3 Severe	3	6	9	12	15
	2 Moderate	2	4	6	8	10
	1 Minor	1	2	3	4	5
	Value level descriptor	1 Very unlikely Rare – if ever	2 Unlikely Seldom	3 Likely Occasional	4 Very likely Frequently	5 Almost certain Often – daily
		LIKELIHOOD/FREQUENCY/PROBABILITY				

Key

	Extremely high
	Very high risk
	High risk
	Medium risk
	Low risk

Germain *et al*. (1998[48]) cited by DEAT (2006:Online), based on the work of W.T. Fine, proposes a format, as shown in Table 2.4, for depicting a three-dimensional risk formula incorporating likelihood, consequence and exposure. This enables organisations to prioritise risks, based on the risk

[48] Germain, L.G., Arnold, R.M., Rowan, J.R. & Roane, J.R. 1998. *Safety, Health and Environmental Management - A Practitioner's Guide*. Georgia: International Risk Management Institute.

scores, in order to determine a risk profile for the risk situations assessed (DEAT, 2006:Online).

Table 2.4: A risk evaluation scoring categorisation example (**Source**: DEAT, 2006:Online).

RISK SCORE – LIKELIHOOD X EXPOSURE X CONSEQUENCE	
LIKELIHOOD *: L	**Value**
Might well be expected (happens often)	10.0
Quite possible	6.0
Unusual but possible	3.0
Only remotely possible (has happened somewhere)	1.0
Conceivable but very unlikely (hasn't happen yet)	0.5
Practically impossible (once in a million)	0.2
Virtually impossible (approaches the impossible)	0.1
* The probability of a loss when the hazardous event does occur	
EXPOSURE *: E	**Value**
Continuous	10.0
Frequently (daily)	6.0
Occasionally (weekly)	3.0
Unusual (monthly)	2.0
Rare (a few per year)	1.0
Very rare (yearly)	0.5
No exposure	0.0
* How frequently the hazardous event occurs	
CONSEQUENCE: C	
Catastrophic (many fatalities, or damage over R10 million)	
Disaster (a few fatalities or damage over R1 million)	
Very serious (one fatality or damage over R100 000)	
Serious (serious injury or damage over R10 000)	
Important (temporary disablement or damage over R1 000)	
Noticeable (minor or damage over R100)	
R = L x E x C: The risk score (magnitude of the risk) is derived by multiplying the likelihood value times the exposure value times the consequence value	
RISK CLASSIFICATION	**RISK SCORE**
Very high risk: Consider discontinuing the operation	Over 400
High risk: Immediate correction required	200 – 400
Substantial risk: Correction needed	70 – 200
Possible risk: Attention is indicated	20 – 70
Low risk: Risk perhaps acceptable as is	Under 20

Embedded in the risk formula of Young (2006:68-69), depicted in Table 2.5, are the elements of risk consequence and risk probability, however the differentiating factor is the inclusion of internal control measures to determine the residual risk. Internal controls are evaluated and rated according to their effectiveness on the following scale:

- 1 = ineffective
- 2 = partially effective
- 3 = totally effective.

Table 2.5: Risk assessment framework incorporating a heat map (**Source**: Young, 2006:68).

Operational risk exposure (inherent risk)	Operational risk factors				Impact	Probability (likelihood X impact)	Internal control measures	Control rating (1-3)	Residual risk (H/M/L)
	People	Processes	Systems	External	(Value or H/M/L)	(H/M/L)			
		Likelihood (H/M/L)							
Internal fraud	H				L	H x L = M	Segregation of duties	2	M

High Medium Low

The residual risk, represented as the net effect after taking control actions into account, is a product of the probability rating and the control rating. When residual risk is rated as high, it is regarded as a key risk indicator. Key risk indicators require management focus so that proactive action can be taken to prevent the risk from occurring.

Business risk measurement is not an exact science as there is no foolproof way of combining the individual likelihood of loss and the impact of loss into an overall measurement of business risk. For a more accurate risk measurement, a combination of qualitative and quantitative measures should be used. However, if quantitative information is unavailable or inaccurate, organisations may use a qualitative approach in generating the risk rating. Organisations should however be aware that using either one of these approaches as the sole measurement technique is not ideal as quantitative measurement is too rigid, while qualitative measurement is often too vague and subjective. The optimum balance is achieved by using a hybrid approach expressing risk in numerical terms (Young, 2006:69).

The next step is the validation of the risk data by reviewing the residual risk. The loss history can be compared to the results of the assessment with any large discrepancies indicating a need to review the assessment results, e.g. when the assessment results indicate a low fraud residual risk, while the actual loss is calculated as high. A review may indicate that such a discrepancy is due to internal control measures that were implemented since for instance a fraud incident, thereby reducing the residual risk (Young, 2006:69).

During the mapping of the identified risk scenarios to enable ranking, there are according to Andersen and Terp (2006:36-37), several factors to consider, namely:

- Risk scenarios with the estimated highest annual impact on the organisation.
- Risk scenarios that potentially threaten the continuity of the organisation.
- Risk scenarios that require the least amount of resources to correct the possible problem.

Williams *et al*. (1998:79), stipulate additional guidelines that should be considered when assessing the importance of risk:

- The importance of risk is more skewed towards the loss impact than the probability of the loss; the importance is whether the loss can impair the organisation’s progress in achieving its vision. Furthermore, a loss may be due to a single event or multiple events.

- In determining the potential loss impact, the financial effect of all resulting losses that may occur as a result of an incident, should be considered.
- A single event may negatively influence numerous persons, activities, processes, facilities, etc.
- The ultimate financial effect of an event may exceed the sum of all direct and indirect losses, that are apparent during the forecast of the event.
- In assessing the loss severity, both the amount of the loss and the time period should be taken into account. The anticipated loss is easier to manage if the probable loss amount is spread over a number of years, as supposed to a loss that should be financed within a limited period.

The last step is the formal reporting of the assessment results to management. The purpose of reporting is:

- To provide risk information to facilitate effective risk management decisions.
- To reflect the organisation's risk exposure.
- To serve as a platform for risk control and risk financing activities.

The risk assessment process is graphically depicted in Figure 2.6, indicating the probability and impact of the risk occurrence.

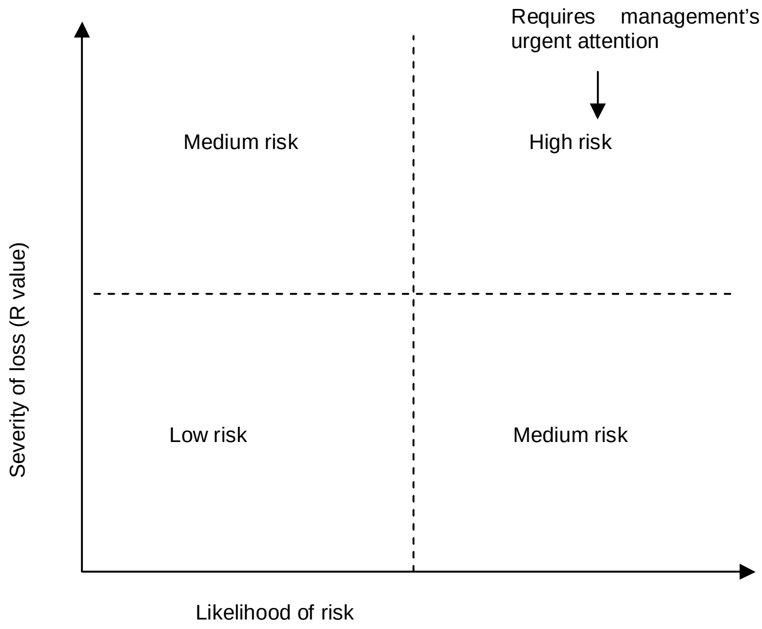

Figure 2.6: Graphic presentation of the likelihood and impact of potential risk (**Source**: Young, 2006:70).

For example, should an organisation falls into the upper right hand quadrant, the organisation has a high likelihood of risk occurring with a corresponding high impact of loss. Similarly, if an organisation falls into the lower left hand quadrant, there is a low probability of risk occurring with a resulting low impact of loss. This enables organisations to determine the urgency of risk attention required (Young, 2006:70).

A variety of risk measurement techniques can be used depending on the specific needs of the organisation. The risk assessment process enables the prioritisation of risk, thereby providing a basis for the selection of risk management techniques to prevent or minimise the effect of business risk (Hollman & Forrest, 1991:53; and Young, 2006:70).

2.10.4.3 Benefits forthcoming from risk assessment activities

According to the DEAT (2006:Online), the basic steps performed during risk assessment are flexible enough to be applied to identify, evaluate and judge a broad range of risks. The risk assessment activities further aids in achieving statutory and regulatory compliance with, for example, occupational health and safety regulations. The advantages of risk assessment also filter through to risk control, resulting in proactive action to avoid incidents, as opposed to reactively addressing risk. Suitable risk control standards, processes and management systems can be developed based on the detailed knowledge of risk characteristics as well as risk causes. These risk controls can be proactively incorporated into processes reducing or eliminating the causes of risk.

2.10.5 Selection and implementation of risk treatment options

The risk assessment phase serves as the basis for the next step in the risk management process, namely the selection and implementation of risk treatment options (Leopoulos *et al*., 2006:323). In the selection and implementation of the risk treatment phase, management is tasked with assessing the acceptability of risk to an organisation. This risk judgement is made by taking the following elements into account (DEAT, 2006:Online):

- The activity's or organisational loss-bearing capacity.
- The organisational risk appetite, i.e. the level of risk that is acceptable to the organisation.
- Liability exposure, e.g. statutory requirements, contracts, etc.
- Social implications, e.g. social responsibility towards community.
- Moral responsibility, e.g. safe working environment for employees.
- Impact on reputation, e.g. specifically listed companies is vulnerable to reputational damage impacting on share price.
- Financial criteria.

During this phase, the appropriate response to the identified risks is developed, whereafter risk treatment actions are prioritised according to the level of the identified risk exposure. Risks with higher levels of exposure should receive treatment before the lower levels of risks are addressed. The event's timing should however be considered in that attention should be directed at risk that is expected to occur first, before attention is directed at risks that are expected to happen at a later stage, even though these risks may have higher exposure (Leopoulos *et al*., 2006:323).

Although different terminology is used (refer to Table 2.6), the risk response action options include financing techniques and operational techniques such as avoidance (if feasible), mitigation (if manageable), transfer (if applicable) and retention (if acceptable) (Hollman & Forrest, 1991:53; and Leopoulos *et al*., 2006:323). While operational techniques are designed to alter a loss exposure, financing techniques are designed to provide funds for losses that occur, thereby minimising the adverse consequences (Hollman & Forrest, 1991:53).

Table 2.6: Comparison of the risk control terminology (**Source**: Adapted DEAT, 2006:Online).

TERMS USED IN RISK CONTROL			**MEANING**
Finance	**Safety**	**Risk Management**	
Decline	Terminate	Elimination/avoidance	Some risks can be avoided by not entering into, stopping the activity or refraining from performing specific hazardous activities
Acceptance	Tolerating	Acceptance/retention	Where the risk return properties are acceptable, or low risk outcomes can be expected, the risk exposure is accepted
Mitigation	Treating	Reduction / mitigation	Where action can be taken to reduce the impact of the risk(s) to an acceptable exposure level
Manage	Transferring	Transferring	Where specific control activities are applied to minimise risk exposure through transferring or outsourcing the risky activity to another party

2.10.5.1 Risk control

More specific, risk control is perceived as any series of activities that prevents losses or reduces their severity, or it can be viewed as complex methodology which encompasses numerous definitions and disciplines (Valsamakis *et al*., 2000:107; and Williams *et al*., 1998:30-31). Risk control is therefore defined by Valsamakis *et al*. (2000:107) as, "… a method of countering risk", which is exercised at the source of the risk. Young (2006:33) defines risk control as, "… the application of techniques to reduce the probability of loss. It aims to eliminate or minimise the potential effect of the identified risk exposures".

The objective of risk control activities are:

- To eliminate or reduce the risk factors giving rise to a loss.
- To minimise the actual loss if preventative controls were not fully effective.
- To avoid potential catastrophic events.
- To enhance the understanding of risks throughout all organisational levels.

Risk control activities should be directed at controlling risk implicit uncertainties, namely the severity of losses and the likelihood of loss occurrence (Valsamakis *et al*., 2000:27,107; and Young, 2006:88-91). Executive management should take ownership of the risk control function by driving the process and providing support, while line management is usually responsible for the implementation and monitoring of risk control (DEAT, 2006:Online). A risk control programme, embedding all risk control activities, entails an analysis of all risk factors, i.e. the cause of loss, as well as action plans and procedures for risk management (Young, 2006:88-91).

According to Young (2006:88-91), in designing, implementing, evaluating and improving risk controls, organisations should familiarise themselves with the characteristics of good controls, namely:

- Controls should be logical, focused and verifiable.
- Controls should be timely and accurate.
- Controls should be reviewed and adjusted when deficiencies are identified.
- Controls should be improved continuously due to changing conditions.

To minimise organisational risks, organisations should embed three types of risk controls into their management processes:

- **Preventative controls:** These controls are designed and implemented to proactively prevent loss events from occurring.
- **Detective controls:** These controls identify loss events as soon as they occur, to limit the effect of the occurrence on the organisation.
- **Contingency controls:** These controls help ensure the sustainability of an organisation once a risk event has occurred.

Risk control activities are primarily directed at the downside of risk in order to prevent the negative consequences of a risk event or to reduce the severity of the event (Young, 2006:88-91).

Operational risk control techniques:

After risks are graphically mapped in terms of impact and likelihood, risk mitigating decisions can be taken, as depicted in Figure 2.7, and executed through risk action plans.

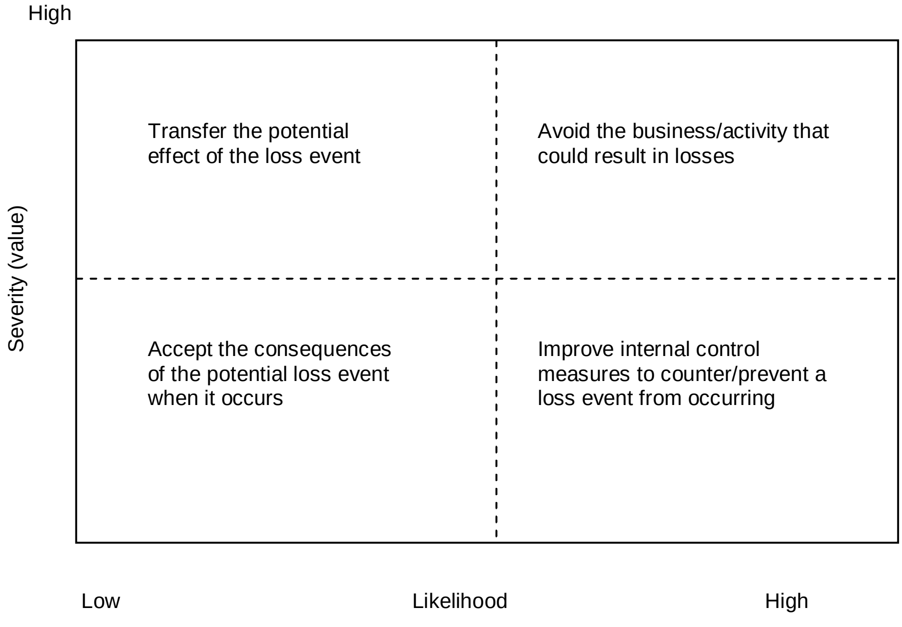

Figure 2.7: Key risk mitigating decisions (**Source**: Young, 2006:90).

Risk action plans should as a minimum:

- Assign responsibility for coordinating risk efforts and assign ownership of risks to individuals/groups.

- Provide additional analysis and mitigation actions needed.
- Specify the time schedule of activities.
- Determine the outcome of the activities.
- Assign responsibility for following up actions.

These risk decisions should be taken in accordance with the organisation's risk appetite for achieving organisational objectives (Bowden *et al*., 2001:14; Andersen & Terp, 2006:36-37; and Young, 2006:88-91).

The four options approach:

Conceptually, four options are available when deciding on the appropriate risk management action:

- **Risk avoidance:** Avoidance represents a decision not to engage in a particular high risk activity/exposure/process or to refrain from any risk event-related action to completely eliminate an anticipated exposure. Risk avoidance has limited use in practice, since to avoid industry-related risks, the organisation never has to enter the industry, or immediate leave the industry. On a sophisticated level, risk avoidance could entail refraining from buying or selling from any organisation that is exposed to the particular industry. In the modern economy with complex interactions between organisations, such a risk strategy would be difficult to implement (Hollman & Forrest, 1991:54; Andersen & Terp, 2006:38-39; and Young, 2006:31-32).
- **Risk acceptance:** Risk acceptance is usually exercised when the likelihood of a risk occurring is extremely low or when the impact of the risks is negligible (Young, 2006:31-32).
- **Risk transfer:** During risk transfer, the ultimate exposure is transferred to another entity outside of the organisation. Risk transfer examples include using sub-contractors, outsourcing activities to independent vendors, using insurance where the cost of the loss when realised is carried by the insurance company. Organisations using risk transfer as the selected option, should take cognisance of possible residual risk exposure that may cause a possible loss to the organisation (Andersen & Terp, 2006:41; and Young, 2006:31-32).

- **Risk mitigation:** The risk mitigation approach can be viewed either as a holistic approach in reducing risk by addressing both risk severity and probability (Young, 2006:31-32), or as comprising two subcategories of risk prevention, directed at reducing the probability of a loss occurring, and risk reduction, directed at reducing the severity of a loss (Hollman & Forrest, 1991:54-55; and Andersen & Terp, 2006:39-40). The economic slowdown with the accompanied organisational drive for cost reduction renewed the focus on risk mitigation activities as an alternative to conventional insurance. Organisations can incorporate risk mitigating activities though actions such as product diversification, thus reducing their dependency on a single source of income (Mundy, 2004:13-14). When successful risk mitigation occurs, the events distribution of outcome follow a more bell-shaped curve, therefore less extreme, benefiting organisations in that less equity capital is required as opposed to if it had not undertaken risk mitigation activities. Economical risk mitigation actions can contribute towards a higher return for shareholders (Kimball, 2000:9,11). Risk mitigation efforts may however be ineffective due to various factors such as agency risk[49], a risk's ability to change form or shift, as well as the incremental failure of risk management activities over a long period of time. Organisations become desensitised to risk, which lead to the gradual decline in risk mitigating activities, resulting in the accumulation of seemingly insignificant failures into a major loss (Kimball, 2000:9).

Risk avoidance, acceptance, transfer and mitigation refer to risk options available to an organisation when managing its risk exposure. These however do not address the specific steps management will follow in giving effect to its choice. These choices should not be seen as to operate in isolation, since in practice they are usually used in a combination approach to ensure an all inclusive and systematic review of the overall organisational exposure. Management is tasked with determining and

[49] Agency risk is when an employee inadvertently or purposefully fails to follow risk mitigating policies and procedures (Kimball, 2000:11).

implementing a risk management process that is appropriate for the organisation (Hollman & Forrest, 1991:59; Andersen & Terp, 2006:37-38; and Young, 2006:33). Specific action taken by management in response to risk is insurance, geographic and product line diversification, screening and monitoring customers, relationship development, interpartnership structures, developing risk management awareness and risk management competencies, etc. (Kimball, 2000:11; and Ritchie & Brindley, 2007:310).

Management should assess the existence and character of residual risk, which is left after all risk efforts were made to avoid, control or share risks. If the residual risk is at an unacceptable level, it should be managed, reported on, and additional risk treatment methods be implemented in addressing such risks (Bowden *et al*., 2001:14-15). In addition to residual risk, control risk should also be considered. Control risks culminate as a result of risk controls which fail resulting in ineffective internal controls. Both residual risk and inherent control risks should receive management's attention (McNamee, 1998:81).

Risk financing: Risk financing is a technique used to treat risk by reimbursing losses that occur despite the implemented risk control efforts. Risk financing techniques do not alter the loss exposure itself, but provide funds for losses incurred, as well as for the recovering of loss events when risk control failed, or where risks cannot be managed adequately (Hollman & Forrest, 1991:56-57; Williams *et al*., 1998:30-31; and Andersen & Terp, 2006:42). Organisations need to select the most efficient risk financing method, by taking cognisance of each risk control method's advantages and costs. The following aspects according to Young (2006:34), DEAT (2006:Online) and Valsamakis *et al.* (2000:27-28), should be considered:

- The retention of risk (internal financing) under a self-funding plan. Within such a dispensation losses are financed using internal funds such as retained earnings, reserves and provisions, e.g. losses are financed and 'hidden' in a repair account.
- The combination of internal and external funding, i.e. shared funding. Commercial insurance serves as an example, where the insurance

premium is reduced in response to the insured's agreement to pay an excess or deductible amount, should a loss occur.

- Transfer funding/external funding, where the cost of risk is transferred to a third party through e.g. commercial insurance. Traditional insurance policies do not provide cover for all types of losses, which may necessitate the need for additional insurance purchases.

2.10.6 Monitoring, review and continuous improvement of risk actions

Risk monitoring is the final stage of the risk management process in terms of which an organisation ensures the effectiveness of its risk management techniques and activities within the boundaries set by organisational policies and procedures (Hollman & Forrest, 1991:63; and Young, 2006:34). If existing controls are found inefficient, risk controls should be revised or new controls implemented, thereby facilitating continuous improvement in the organisation (DEAT, 2006:Online).

Continuous monitoring at all organisational levels, is important to any risk management process against the background of a constantly changing environment e.g. legislation, market conditions and competitors. Management should be informed of new developments and the potential impact of these on the organisation's risk exposure. These changes necessitate the need for continuous evaluation and adjustment to controls and risk measures. Such monitoring and review should be executed through internal and external audit, regular investigations (e.g. system testing), and regular reporting. Such mechanisms should contain clear and relevant information and organisational management reviews in terms of which management and shareholders are kept informed about the organisation's risk exposure, risk control actions taken and the organisational preparedness to deal with risk events (Kubitscheck, 2000:41; Bowden *et al*., 2001:14-15; and Andersen & Terp, 2006:44).

The detailed risk management process, concluded with the final phase of risk review, monitoring and continuous improvement, is graphically depicted in Figure 2.8.

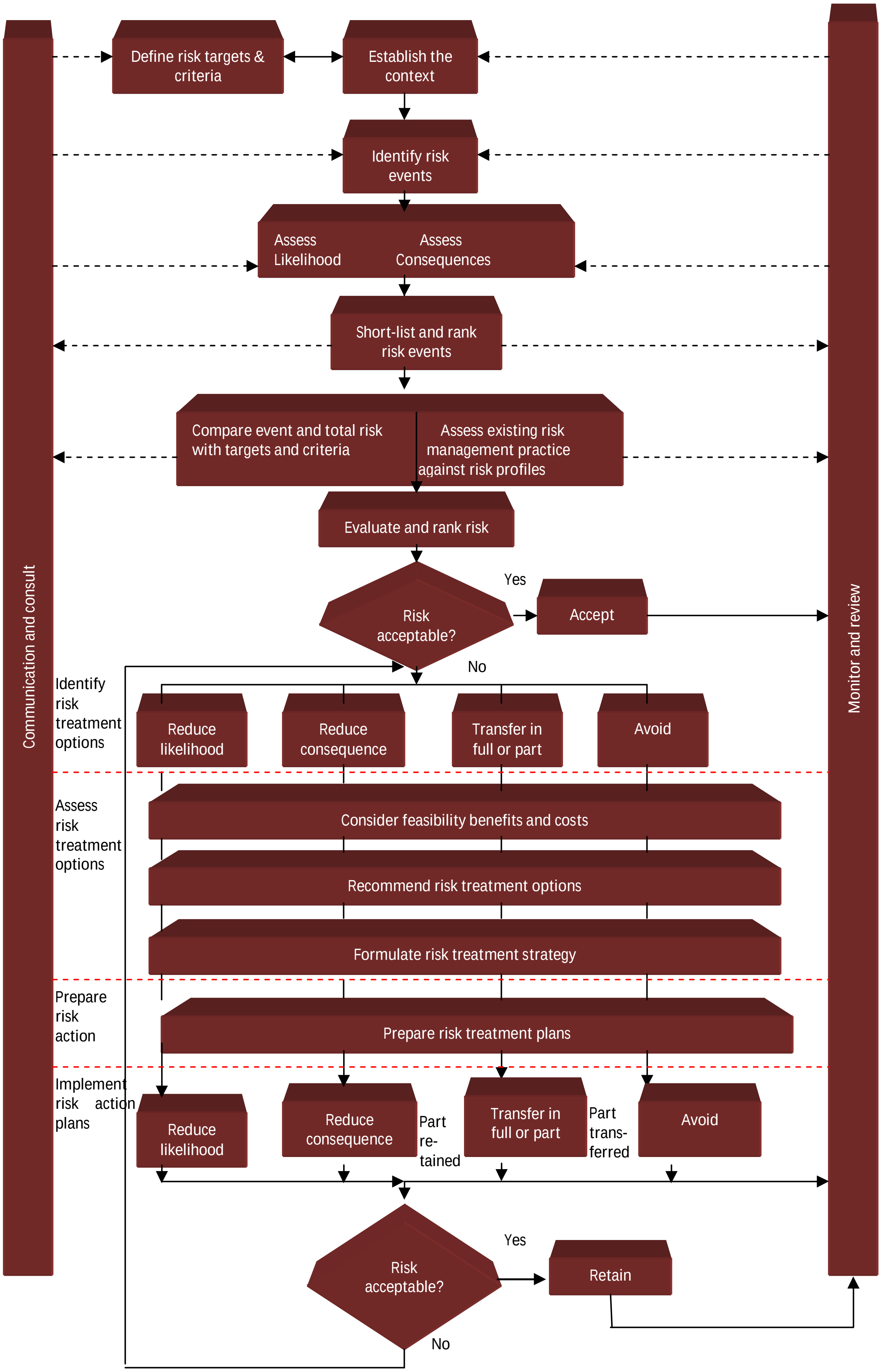

Figure 2.8: Overview of the risk management process (**Source**: Bowden *et al*., 2001:9).

During monitoring, review, and continuous improvement, organisational attention is directed at confirming the actual implementation of risk reduction methods, the effectiveness thereof, as well as the identification of new risks in order to limit risk exposure (Bowden *et al*., 2001:14-15).

2.11 RATIONALES FOR RISK MANAGEMENT WHICH ENHANCES VALUE

Managers' personal bias may have an influence on risk management priorities in that they may have large investments in an organisation i.e. their skills etc., which they wish to safeguard. Managers as a rule are concerned with risks that may have an adverse impact on organisational profits, and may lead to possible bankruptcy. Furthermore, times of economic slowdown or general financial distress including bankruptcy, may lead to the replacement of the current management. In addition, management as a result may be willing to enter into arrangements where they engage in risk management activities that reduce profit in good economic times, while supplementing the organisational income in bad times (Cummins *et al*., 1998:30).

Corporate accountability, in particular the manner in which organisations engage in their fiduciary duties, necessitates managers to adopt a rational, defensible method to determine how risk management cost is to be spent. By assessing risk, managers are able to differentiate between acceptable and unacceptable risk events, and as a result enable them to capture and process information to assist them in the development of a risk management strategy (Bowden *et al*., 2001:15). Furthermore, a sound risk management policy provides owners with confidence in the capabilities of the organisation in managing risk; owners can thus direct their attention to less manageable speculative risks, which they seek to avoid (Hollman & Forrest, 1991:64).

In addition to the reasons discussed above, managerial motives for risk management according to Valsamakis *et al*. (2000:16-17), can further include the following:

- Cost beneficial activities in risk management are undertaken with the emphasis on achieving efficient long-term risk-return trade-offs.
- People are prepared to forgo a part of the existing wealth to safeguard the remainder of the wealth. People are risk adverse, which can lead to actions which are not always cost-beneficial. This influences the risk management programme.
- The design and implementation of a risk management programme can serve as a by-product of other managerial actions, e.g. the implementation of a quality assurance programme may be due to the organisation's strive for excellence, and not in response to a managerial need to reduce liability resulting from defective products.
- Authoritative reasons such as regulatory compliance can drive risk management activities.

The versatility of the risk management process facilitates its use in that it provides a generic framework to identify and manage all types of risks throughout all divisional levels of an organisation. The framework requires continuous review by which continued improvement in controlling risk is effected (DEAT, 2006:Online). It thereby aids in aligning the organisation, whereby the organisational objectives are clearly visible and understood, positive and negative risks in achieving the objectives are identified and understood, and risk responses i.e. controls, are aligned (Anderson, s.a:40-42).

2.12 CONCLUSION

Under the auspices of a traditional risk management approach, organisations use disaggregated methods to manage risk, causing a silo-based risk approach (Liebenberg & Hoyt, 2003:39). Within the ambit of such a dispensation, risks were either categorised into hazards, financial, operational, technological and strategic risks, and managed in isolation.

Due to the silo-based risk approach, no coordination of risk management activities occurred and the identification of possible new risks were neglected (Rao & Marie, 2007:10-11).

Traditional risk management typically views risk as individual hazards, failing to consider the interconnectedness of risks. Risks are identified without allocating responsibility for risk ownership, and employees in general tend to shy away from accepting any responsibility towards risks (Banham, 2004:68). In addition, some organisations tend to limit their attention to insurable risk, while others neglect to link business risks to business objectives, leading to a large volume of identified risks not being linked to the organisation's critical objectives (McCuaig, 2000:18).

Although many organisations have a risk-related department such as a compliance function, these departments are generally not well-developed and have a narrow scope within which they operate. Activities are centred on a control base or regulatory base, and do not encompass a broad risk view to manage risk effectively. In addition, many of these departments do not sufficiently link risk management processes to business strategy. In today's business environment, traditional risk management activities do not suffice (Bowling *et al*., 2003:16-17). It is non-refutable that risk management should be approached in a holistic and integrated fashion. Management should be tasked with applying the risk management steps consistently at all levels in the organisation. The value of risk management is attributable to its proactive nature, identifying risks that can influence the strategic direction of an organisation (Kubitscheck, 2000:39).

The mismanagement of risk can lead to financial loss, reputational loss, decreased shareholder value and the destruction of the organisation. Therefore, in today's business environment, organisations need to adopt an enterprise risk management approach (Rao & Marie, 2007:10-11).

CHAPTER 3
ENTERPRISE RISK MANAGEMENT – A LITERATURE REVIEW

SYNOPSIS

Traditionally, the scope of risk management was narrowly focused on hazard or property/liability risks, while risk management strategies centred on insurance solutions. However, changes in the business landscape underpinned organisations' move towards a more integrated, comprehensive and strategy-focused risk management discipline, defined as Enterprise Risk Management (ERM).

Organisations' response to risk evolves along an ERM maturity continuum, where the initial compliance focused activities are refined and optimised affecting an integrated, strategy-aligned risk process. Although organisations' ERM activities can be executed by using various approaches, a generic ERM process of risk identification, risk measurement, risk mitigation and risk monitoring can be more suitably applied.

Various frameworks go beyond the traditional risk management focus by advocating a link to strategy and strategic risks. However, on evaluation of these frameworks, it is evident that inefficiencies exist as strategy formation, business and growth opportunities, and guidance in the risk evaluation and communication process, are not addressed.

Embedding ERM into an organisation, holds many advantages such as helping the organisation meet its vision. However, various limitations impede on the successful implementation of ERM, as evidenced in surveys conducted in organisations in Denmark, Western Europe, United Arab Emirates, United Kingdom and Germany.

The content of Chapter 3, along with the relative positioning of the topics, is graphically depicted in Figure 3.

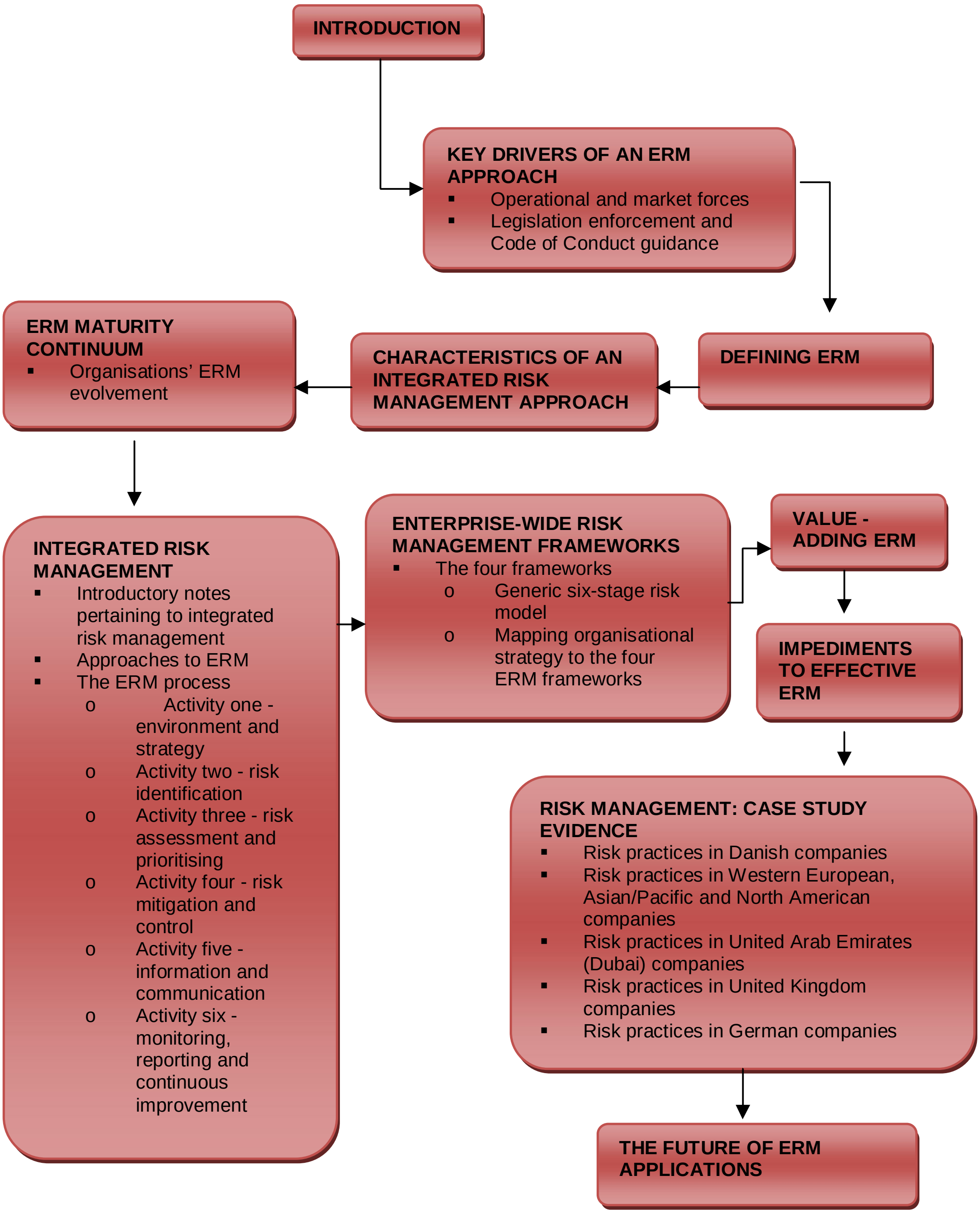

Figure 3: Detailed layout of Chapter 3 – Enterprise risk management: A literature review.

CHAPTER 3

ENTERPRISE RISK MANAGEMENT – A LITERATURE REVIEW

3.1 INTRODUCTION

The analytical process followed thus far, is graphically depicted in Figure 3.1, which places the chapters in context with the overall thesis objectives, and furthermore indicates the relative positioning of this chapter.

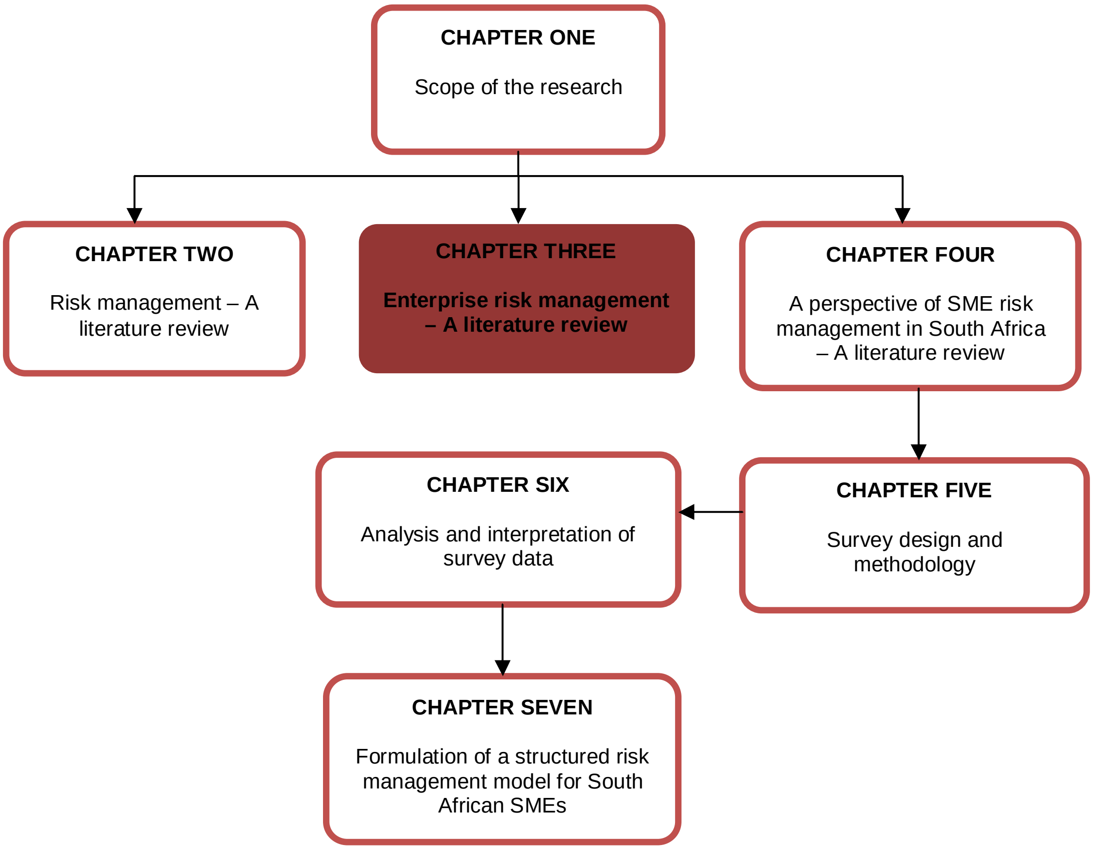

Figure 3.1: Chapter 3 - Enterprise risk management positioning.

Enterprise Risk Management (ERM)[50] differs considerably from traditional risk management (Miccolis *et al*., s.a.:xviii). The difference between ERM and more traditional ways of managing risks is that an ERM approach is

[50] ERM is synonymous with integrated risk management, holistic risk management, enterprise-wide risk management, business risk management, consolidated risk management and strategic risk management.

focused on a high-level oversight of an organisation's entire risk portfolio, as opposed to managing risks in isolation, i.e. the 'silo-approach' (Banham, 2004:65-71; and Beasley, Chen, Nunez & Wright, 2006:49). Traditionally, the scope of risk management has been narrowly focused with the scope of risks confined to purely hazard or property/liability risks, while risk management strategies centred on insurance solutions. The traditional approach has tended to treat the occurrence of risk purely as a downside phenomenon, with little to no focus on the impact on the organisation's bottom-line objectives. This culminated in the focus of risk being vested in an insurance solution, regardless of the risk materiality (Miccolis *et al*., s.a.:xviii).

According to Briers (2000:17), changes in the business world and the increasing complexity of the business environment were the driving forces in the evolution of multifaceted risk management disciplines. Changes such as the increased usage of computer technology, the development of new business models, the increasing awareness of corporate reputation, the increase in international business rivals, the emphasis shifting from the value of tangible assets to intellectual capital, and a whole host of positive and negative changes have created new and additional risks in the minds of executives. Currently, risk management is used to address uncertainty where there is no history to guide organisations.

The underlying premise of ERM is that every organisation's goal is to provide value to its stakeholders. Management therefore needs to determine how much uncertainty it is willing to accept while still contributing towards shareholder value. As events have a dualistic character of both risk and opportunity, it holds either a potential to erode or enhance value. ERM processes enable an organisation's management to effectively deal with uncertainty and in the process, enhance the organisation's capacity to build value (COSO, 2004:Online).

The development of an ERM programme that has the capability to deal with all types of risk facing every part of the organisation, is aimed at by many organisations. From a holistic perspective, this aim seems relatively simple, yet many companies face numerous difficulties in the execution of this aim as different views of risk and organisational silos, impact on the implementation of such a programme. Despite these and other difficulties encountered, there is considerable momentum within the business community to develop a common approach to risk management which is based on an approach that addresses all types of risk an organisation may encounter. Organisations desire a holistic, integrated and consistent risk management model, that will satisfy their needs to respond to risk effectively (Briers, 2000:128).

3.2 KEY DRIVERS OF AN ERM APPROACH

The ERM movement has been driven by a few significant factors. The increasing complexity of business, with a shift in firm's vulnerability and levels of criticality, has changed the risk profile of most corporate organisations (Briers, 2000:128). Best practices, guided by well-debated published reports and legislative enforcement by acts such as the Sarbanes-Oxley Act (SOX, 2002:Online), changed the risk landscape of organisations.

3.2.1 Operational and market forces

An organisational ERM approach is more often than not attributed to a combination of external and internal factors. Internal factors are centred on an emphasis to maximise shareholder wealth. This is achieved through an integrated risk approach, reducing inefficiencies, which culminates from the traditional silo-based risk approach, and results in the stabilisation of earnings by preventing the aggregation of risks from different sources (Cumming & Hirtle, 2001:1-17; Lam, 2001:16-20; Miccolis & Shah, 2000[51] cited by Liebenberg & Hoyt, 2003:40-41; and CFO Research Services,

[51] Miccolis, J. & Shah, S. 2000. *Enterprise Risk Management: An Analytic Approach*. Tillinghast-Towers Perrin.[Online]. http://www.tillinghast.com/tillinghast/publications/reports/Enterprise_Risk_Management_An_Analytic_Approach/erm2000.pdf.

2002[52] cited by Liebenberg & Hoyt, 2003:40-41). Integrated risk management eliminates the duplication of risk management activities by exploiting natural leverages. As ERM enables organisations to improve their understanding of the aggregate risk inherent in different activities, managers can allocated the firm's resources more effectively, leading to improved capital efficiency and improving the firm's return on equity (Pickford, 2001:124; Meulbroek, 2002:56-70; and Liebenberg & Hoyt, 2003:41).

A further key driver underpinning ERM development relates to the interdependencies between risks. Previously, no risk information sharing within the same organisation occurred, as each process, activity and department were management in isolation, and potential interdependencies between risks across various activities, would have gone unnoticed. Managers are now realising that risks in one part of an organisation are likely to have an impact on other parts of the organisation as risks do not as a rule, occur in isolation (Briers, 2000:129). The ERM structure provides management with an integrated risk framework, that enables the identification of risk interdependencies (Liebenberg & Hoyt, 2003:41).

The use of advanced Information Technology (IT) has enabled firms to model complex business activities, thereby improving their understanding of the interdependencies between firm-wide risks (Jablonowski, 2001:30-35; and Liebenberg & Hoyt, 2003:41). The increased availability of outsourcing options for advanced IT modelling activities has made ERM available to a wider range of firms that lack specialised risk related knowledge. However, recent survey evidence suggests that the implementation of ERM programmes is slowed down by organisations'

[52] CFO Research Services. 2002. *Strategic Risk Management: New Disciplines, New Opportunities*. CFO Publishing Corp., March.[Online]. http://www.aon.com/about/publications/pdf/issues/aon_cfo_report.pdf.

perceived lack of technological tools (Miccolis & Shah, 2000[53] cited by Liebenberg & Hoyt, 2003:41).

External influences such as globalisation, industry consolidation and deregulation, increased competition and legislative pressures to comply with corporate governance, are some of the drivers of the enterprise-wide risk management approach (Lam & Kawamoto, 1997:30-34; Miller, 1992:311-332; and Liebenberg & Hoyt, 2003:40). ERM enables organisations to make better risk decisions as risks are incorporated in the organisations' strategy, in turn leading to an improvement in shareholder value (Lam & Kawamoto, 1997:30-34; and Meulbroek, 2002:56-70).

A further source of value that can be derived from the implementation of ERM programmes is the availability of improved information about the organisation's risk profile. Outsiders will likely experience difficulty in assessing the risk profile and to a limited extent, the financial position of an organisation. ERM enables organisations to enhance the quality and scope of their risk reporting to outsiders, and to confirm the organisation's commitment to the process of risk management, resulting in a reduction of the cost of external capital as well as the level of regulatory scrutiny (Meulbroek, 2002:56-70; and Liebenberg & Hoyt, 2003:41).

3.2.2 Legislation enforcement and Code of Conduct guidance

The codes of conduct driving the ERM process is Basel II (Basel II, 2004:Online), the Dey report with its recommendations incorporated in the Risk Management Policy and the Integrated Risk Management Framework issued by the Treasury Board of the Canadian Secretariat (Canadian Treasury Board, 1999:Online), the King report on Corporate Governance (King II, 2002:Online; and King III, 2009:Online) and The United Kingdom Corporate Governance Code (UK Code, 2010:Online). Basel II for instance explicitly prescribes that operational risk must be adequately

[53] Refer to footnote 51.

managed, while King III recommends that the board of directors should assume the responsibility for identifying key risk areas which should be regularly monitored, and the Dey report in Canada makes transparent the expectation that firms should formally assess their risk management processes and begin to disclose both the risk management processes and their results.

The amalgamation of the recommendations by the Cadbury Committee (Cadbury Committee, 1992), Greenbury Committee (Greenbury, 1995), Hampel Committee (Hampel Committee, 1998) and Turnbull Committee (Internal Control Working Party, 1999) into the Combined Code of the Committee on Corporate Governance (Combined Code on Corporate Governance, 2003:Online), which was amended and renamed as the UK Corporate Governance Code (UK Code, 2010:Online), are compulsory to all premier listed companies on the London Stock Exchange with effect 29 June 2010. This code states that: “The board should maintain sound risk management and internal control systems”, and, “The board should, at least annually, conduct a review of the effectiveness of the company’s risk management and internal control system and should report to shareholders that they have done so”.

In addition, regulations such as the Sarbanes-Oxley Act (SOX, 2002:Online), require the adoption of a control framework such as the control framework of the Committee of Sponsoring Organisations of the Treadway Commission (COSO, 2004:Online), which has become a standard for accounting. The COSO framework was initially focused on internal control, but the publication of COSO’s ERM framework (COSO, 2004:Online), incorporates the importance of risk management into good business practice (Abrams, Von Känel, Müller, Pfitzmann & Ruschka-Taylor, 2007:220).

Driven by the need to improve their insight into their business processes, to understand and manage risks, to align risk management with the organisation’s strategy, and to create greater transparency, organisations must develop a strategy-linked approach to define, manage and monitor risks from internal and external sources in their organisations (Abrams *et al*., 2007:232).

3.3 DEFINING ERM

To fully understand ERM, a basic definition of enterprise risk is provided by Dickinson (2001:361) as: "… the extent to which the outcome from the corporate strategy of a company may differ from those specified in its corporate objectives, or the extent to which they fail to meet these objectives". The corporate strategy derived from the corporate objectives is tied to a certain risk profile, which is formulated by taking into account various factors that might impact on the organisation's activities and processes.

Valsamakis *et al.* (2000:22), adopted a risk management definition that reflects the managerial nature and integrated approach of risk management. Implicit to the definition, is management's involvement in strategic decision-making: "Risk management is a managerial function aimed at protecting the organisation, its people, assets, and profits, against the physical and financial consequences (adverse) of event risk. It involves planning, coordinating and directing the risk control and the risk financing activities in the organisation" (Valsamakis *et al*., 2000:22).

The Federation of European Risk Management Associations (FERMA, 2003:Online), also addresses the strategic nature of risk management. According to FERMA, risk management is a systematic process of addressing risks that are attached to a company's strategic objectives, by ensuring that sustained benefit is achieved within all activities and processes.

According to Schrøder (2006:66), ERM is: "… a holistic systematic and integrated approach to the management of all key risks and opportunities with the intent of maximizing shareholder value for the enterprise as a whole". ERM is defined by Miccolis *et al.* (S.a.: xxii), as: "A rigorous and coordinated approach to assessing and responding to all risks that affect the achievement of an organization's strategic and financial objectives. This includes both upside and downside risks". Briers (2000:8), formulated the following definition of risk management, namely: "Risk Management is the process of intervention in economic and behavioural risk dynamics so that the value of the organisation is enhanced".

The well-publicised COSO ERM framework (COSO, 2004:Online), defines ERM as follows: "ERM is a process, effected by an entity's board of directors, management and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risk to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives".

According to Abrams *et al.* (2007:221), an evaluation of the numerous ERM definitions show that they share three critical characteristics, namely in that ERM should be:

- **Integrated:** ERM must span all the lines of business.
- **Comprehensive/inclusive:** ERM must include all types of risk.
- **Strategic:** ERM must be aligned with the overall business strategy and objectives of the organisation.

As companies begin to manage risk, they realise that they cannot manage it in an isolated manner by activity, process or department alone, but rather in an inclusive, integrated way throughout the organisation. Such an integrated risk management practice entails the defining of risk (positive risk, i.e. opportunities and negative risk), the establishment of risk tolerances, the formulation of policies and procedures dealing with risk, the inclusion of risk in all decision-making processes, taking into account the interconnectedness of risks, and the reporting of risk in a consistent manner, all within the boundaries of a single business strategy of the organisation (Abrams *et al*., 2007:222).

3.4 CHARACTERISTICS OF AN INTEGRATED RISK MANAGEMENT APPROACH

Global competition and volatile markets have necessitated the need for risk management. A modern business environment requires a holistic risk management approach that is comprehensive, inclusive and proactive (Valsamakis *et al*., 2000:20-22). These three entities are expanded upon below:

- **Comprehensive:** In order to be comprehensive, three key aspects of an organisation should be considered, namely:
  - The organisation's strategy.
  - The organisation's business processes.
  - The organisation's human capital, i.e. its people.
- **Inclusive:** Risk management should include all the decision-making levels of an organisation. Strategically, the organisation's board must provide a clearly defined framework setting the risk tolerance of the organisation. The framework should provide guidance as to the risk action, i.e. levels of risk acceptance, the identification of risks to be transferred, and the identification of risks to be insured. Management should therefore fully understand risk management principles, and the process of embedding an integrated risk management culture throughout all business processes in the organisation. All operational levels of the organisation should be involved in the risk management process to counter inconsistent risk management approaches or risk management practised in departmental silos that may hold unnecessary risk for the organisation.
- **Proactive:** Risk events should be anticipated in advance with risk responses taken by way of risk control and risk financing activities. Proactive risk management includes risk management in general management activities, and prohibits the practice of isolated risk management functions.

3.5 ERM MATURITY CONTINUUM

Changing business environments brought about by global competition, technological change and the aim to attain a competitive advantage, are motivating organisations to implement risk management processes (Brindley, 2004[54] cited by Ritchie & Brindley, 2007:303).

According to Abrams *et al*. (2007:222-224), business response to risk evolves along an ERM maturity continuum as depicted in Figure 3.2.

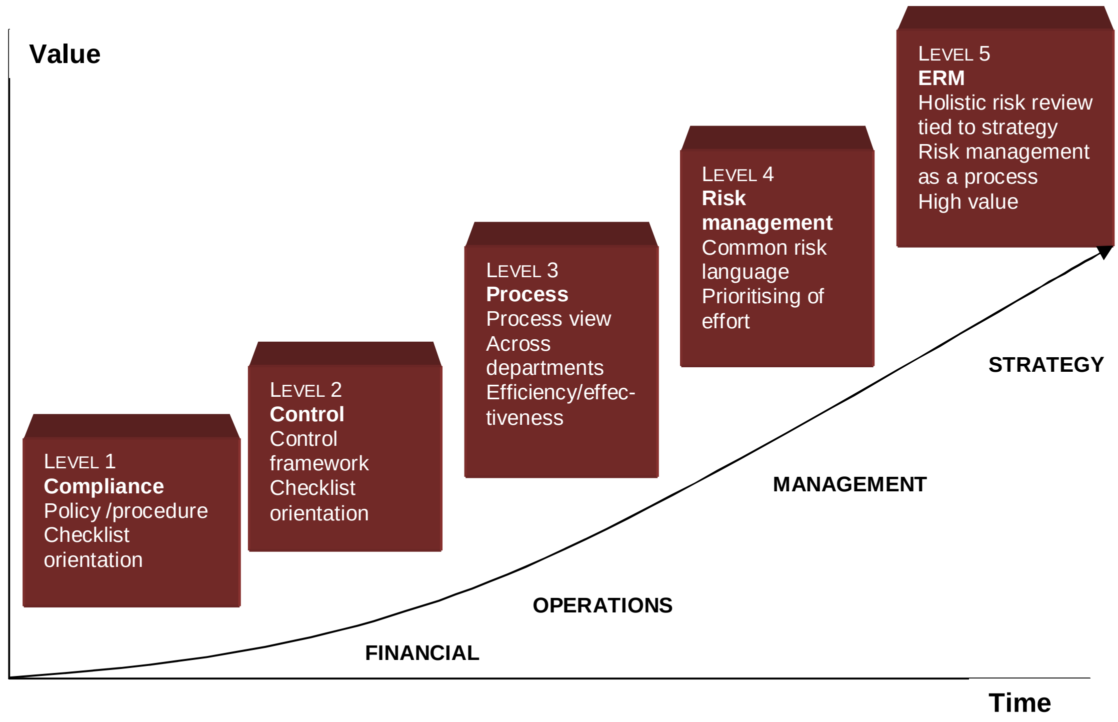

Figure 3.2: A journey to enterprise risk management (**Source**: Bowling *et al*., 2003:17; and Bowling & Rieger, 2005:25).

Organisations initially engage in risk management activities by complying with laws and regulations. These activities are refined and ERM progress is made by optimising current activities to ensure sustainability. In the final stage of an organisation's ERM evolvement, management engages in continuous risk management, in order to attain a competitive advantage.

[54] Brindley, C.S. (ed.). 2004. *Supply Chain Risk*. Aldershot: Ashgate Publishing.

3.5.1 Organisations' ERM evolvement

According to Abrams *et al*. (2007:222-224), an initial risk focus is limited to compliance procedures in order to limit or avoid penalties due to regulation transgressions. Compliance focus is centred on manual audit and control procedures, in addition to existing procedures. These audit and control procedures carry additional overhead cost and additional strain on manpower availability in terms of time and expertise. Furthermore, these additional activities are not integrated into business processes, and the value derived from them is limited to corrective action and accurate reporting on realised risk events.

The realisation that compliance activities should be sustainable and that compliance procedures need to adapt to changing regulations, lead organisations to the improvement stage. The initial focus of most organisations will be on cost-efficiency, through the improvement of compliance and control procedures achieved by the implementation of standardised enterprise-wide procedures and automated compliance status monitoring. These automated controls will over time replace redundant control procedures, by incorporating more effectively designed random audit checks and controls. In turn, this will help the organisation in achieving segregation of responsibilities and an increase in accountability (Abrams *et al*., 2007:222-224).

Compliance activities place strain on the resources of organisations, resulting in organisations realising the benefit of integrating risk and compliance activities into the organisations' business strategy. The improvement of business processes and the elimination of duplicate business activities as a rule result in cost-savings and timely action in the detection of potential risks. As the organisation further integrates risk management, it becomes more transparent and preventative in its risk management activities, reducing remediation costs (Abrams *et al*., 2007:222-224).

As the organisation's risk management activities evolve, it enters the transformation stage, whereby an enterprise-wide risk management approach is followed. In the transformation stage, the organisation differentiates between risks and opportunities, by following well-defined risk policies and regulations. During this stage, it is focused on simplifying, standardising and rationalising processes by incorporating automated control points into business activities, to replace manual controls. Inefficiencies and unnecessary costs are usually identified in this stage of risk evolution. By standardising processes throughout the enterprise, it allows for common event infrastructure that collects information from internal and external sources. This information is analysed and incorporated into the business processes, to align these processes with the holistic impact of internal and external events (Abrams *et al*., 2007:222-224).

By holistically managing events, risks and opportunities linked to events are identified and business activities are optimised. Automated processes and policies are embedded in the organisation with a holistic risk response and mitigation strategy. The focus is on optimising the automated processes, to avoid substandard processes (Abrams *et al*., 2007:222-224).

3.6 INTEGRATED RISK MANAGEMENT

The scope of traditional risk management is limited to insurable risks. These risks are managed in isolation at the source of the risk, i.e. departmental or process or activity, through insurance, financial products and internal controls to protect the organisation against its negative economic impact. However, mismanagement, fraud and other irregularities as was evident in companies such as Enron, WorldCom, Parmalat, and Fidentia, placed pressure from corporate bodies such as COSO and from legislation such as the Sarbanes-Oxley Act in the US, on organisations to take greater accountability in managing risk on an enterprise-wide basis (Schrøder, 2006:65). Unlike the traditional risk management approach, holistic risk management transforms risk management from a ‘defensive’ activity to an ‘offensive, strategic’ process (Liebenberg & Hoyt, 2003:37).

3.6.1 Introductory notes pertaining to integrated risk management

Organisations are recognising the growing importance of managing risk from a holistic perspective, since a ‘silo’ approach may not detect significant risks or direct risks to less visible areas within the organisation, thereby creating a false sense of security. The ‘silo mentality’ by addressing risk in isolation and separating responsibility for different types of risk, is no longer sufficient (Pickford, 2001:124). An effective risk management policy and programme, with the support of the most senior managers, should integrate ERM into the organisational culture. The strategy should be translated into tactical and operational objective. Furthermore, all employees should incorporate the managing of risk into their portfolios. ERM leads to operational efficiency by encouraging accountability, performance measurement and reward (FERMA, 2003:Online).

The benefit forthcoming from such an effort, is an improved understanding of organisational risks. This understanding will at a minimum eliminate unnecessary transactions, and enable the organisation to take advantage of diversification (Pickford, 2001:124).

Traditional risk management has the effect that while an organisation attempts to manage one type of risk, it may inadvertently create another. To counter such an occurrence, organisations should use a consistent risk methodology in measuring, controlling and managing risk by taking into account the interconnectedness of risks, in terms of the ERM approach (Pickford, 2001:123).

Well-executed risk management according to FERMA (2003:Online):

- Address all risks.
- Adds sustainable value to all business activities.

- Imparts an understanding of the positive events (opportunities) and negative events (risks) that can influence the organisation.
- Reduces the probability of failing to achieve the organisation's objectives. Risk management should be a strategy-aligned, ongoing activity throughout the organisation, subject to continuous improvement. Furthermore, it should meticulously address all past, present and future risks impacting on an organisation.

3.6.2 Approaches to ERM

According to Miccolis *et al.* (S.a.:xxxiii-xxxiv), two general ERM approaches have emerged within the risk management arena, namely a 'measurement-driven' approach and a 'process-control' approach. These approaches are not mutually exclusive, and share many common characteristics with the differentiating factor their emphasis on certain areas. Both these approaches display strengths and weaknesses, which are elaborated upon below.

- **Approach 1 - Measurement-driven approach:** This approach, graphically depicted in Figure 3.3, focuses on identifying key risks facing an organisation by taking into account the event's materiality and probability of occurrence.

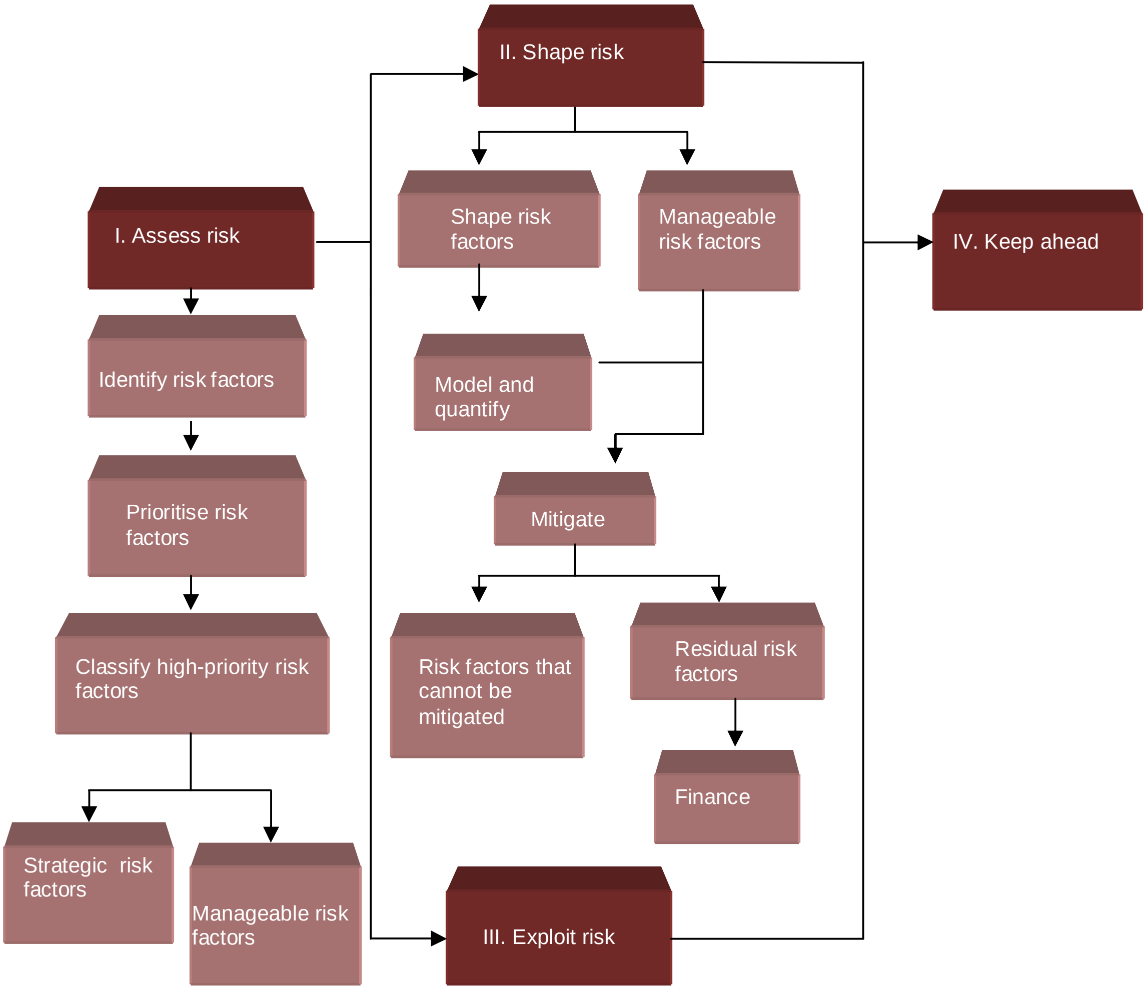

Figure 3.3: Measurement-driven approach to ERM (**Source**: Adapted from Miccolis *et al*., s.a.:xxxiii-xxxiv).

Risk reduction activities, in line with predetermined risk strategies, are directed at the most relevant material risks. Management's attention is therefore directed at the most critical risk areas in the organisation. A weakness of this approach, is the escalating nature of risk. Seemingly insignificant risks can trigger a series of events that initially appear small with a low probability of occurrence, however which can quickly escalate to become significant risks while management's attention was directed at other risks (Miccolis *et al*., s.a.:xxxiii-xxxiv).

➢ **Approach 2 - Process-control approach:** This approach focuses on key business processes and the uncertainties embedded in the execution of the business plan. The objective is to ensure informed decision-making, by linking the process steps, reporting relationships, methodologies and data collection, thereby managing the events in a consistent and coherent manner while reducing the possibility of unexpected occurrences. The process-control approach does not categorise risk according to materiality, however it focuses on the management of processes through the reliable, meticulous management of business processes. This approach implicitly implies that good processes can manage risk, but inherent to this assumption is the risk that suboptimum processes cannot manage risk due to lack of proper execution and monitoring (Miccolis *et al.*, s.a.:xxxiii-xxxiv). An applied process-control approach is graphically depicted in Figure 3.4.

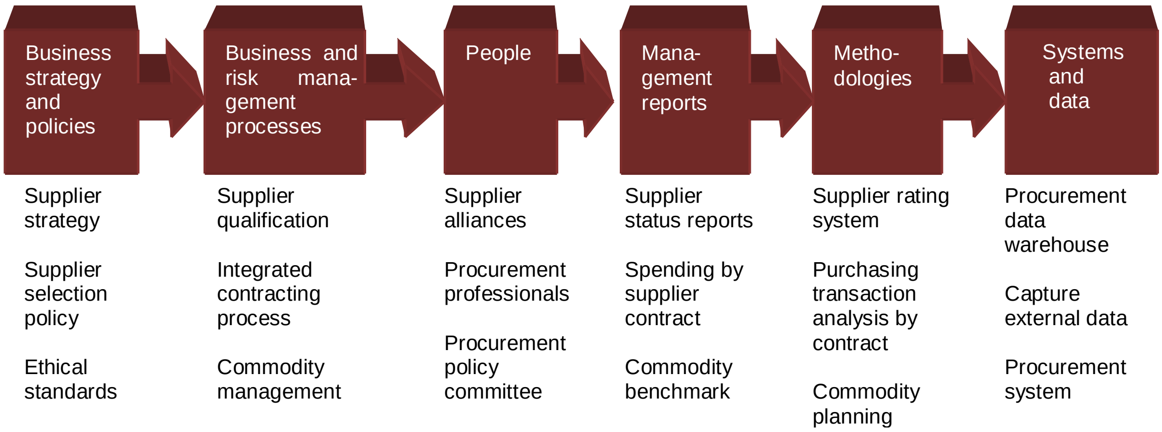

Figure 3.4: Process control approach to ERM for procurement department (**Source**: Miccolis *et al*., s.a.:xxxv).

The following generic processes occur in both the measurement-driven and the process-control approach (Miccolis *et al.*, s.a.:xxxiii-xxxiv):

➢ **Risk identification:** Determining the risks across business functions and units in the organisation.

➢ **Risk measurement:** Determining the potential impact of these risk factors.

- **Risk mitigation:** Determining the optimum approach in managing/eliminating the risks.
- **Risk monitoring:** Evaluating whether the risk mitigation strategy is effective.

There is no single correct ERM approach. In practice, organisations are likely to adopt a mixture of both of these approaches into their ERM activities (Miccolis *et al*., s.a.:xxxii).

3.6.3 The ERM process

The starting point of all ERM activities is the availability of an effective and efficient infrastructure to support the process, followed by the risk analysis steps, which include risk identifying, sourcing and measurement. The process includes management devising a risk management strategy as well as the implementation of the formulated strategy. To ensure the efficient and effective working of the processes, the risks, the risk strategies, and the implementation activities should be monitored on a continuous basis. All these activities should be performed keeping the main objectives of the ERM process in mind as graphically depicted in Figure 3.5 (Bowling *et al*., 2003:18).

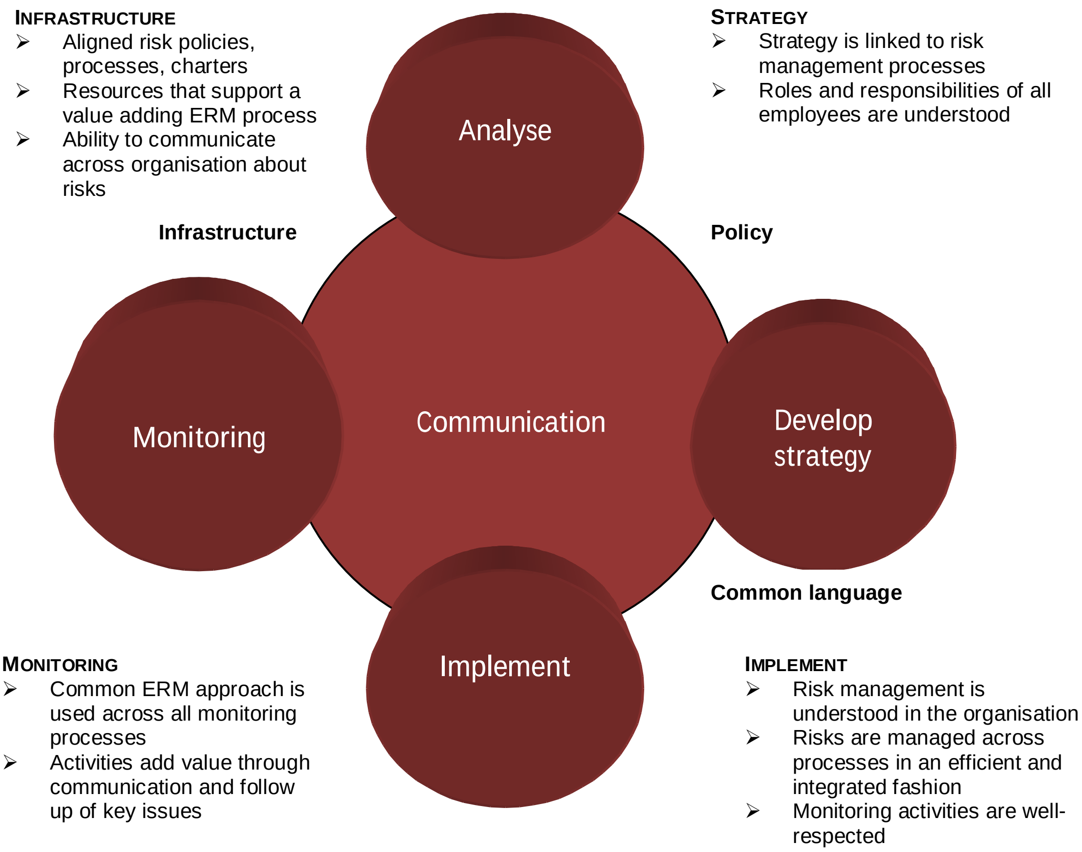

Figure 3.5: Key objectives of the enterprise risk management process (**Source**: Bowling *et al*., 2003:18).

COSO (2004:Online) identifies four categories within which an organisation should achieve its objectives. These should be cascaded through the organisation and aligned to the organisation's mission, strategic objectives, and strategy. COSO (2004:Online) elaborates on these four categories as follows:

- **Strategic:** High level objectives, linked with and supporting the organisation's mission.
- **Operational:** Effective and efficient use of organisational resources, addressing the organisation's business objectives.
- **Reporting:** Reliability of reporting, i.e. accuracy, timeliness, appropriateness, etc.
- **Compliance:** Organisational compliance with applicable laws and regulations.

By categorising the organisation's objectives, the focus is directed at the different ERM aspects. ERM will aid in the achievement of internal objectives within the organisation's control such as reliability of reporting, and compliance with laws and regulations. As far as external objectives such as operational and strategic activities are concerned (which are not always within the organisation's control), ERM can provide reasonable assurance that management is informed of the organisation's level of achievement of these goals (COSO, 2004:Online).

An ERM process can be broadly categorised into six main activities, which consist of further subprocesses as depicted in Figure 3.6. ERM is not strictly a 'serial process'; it is a 'multidirectional process', in which activities influence each other (COSO, 2004:Online).

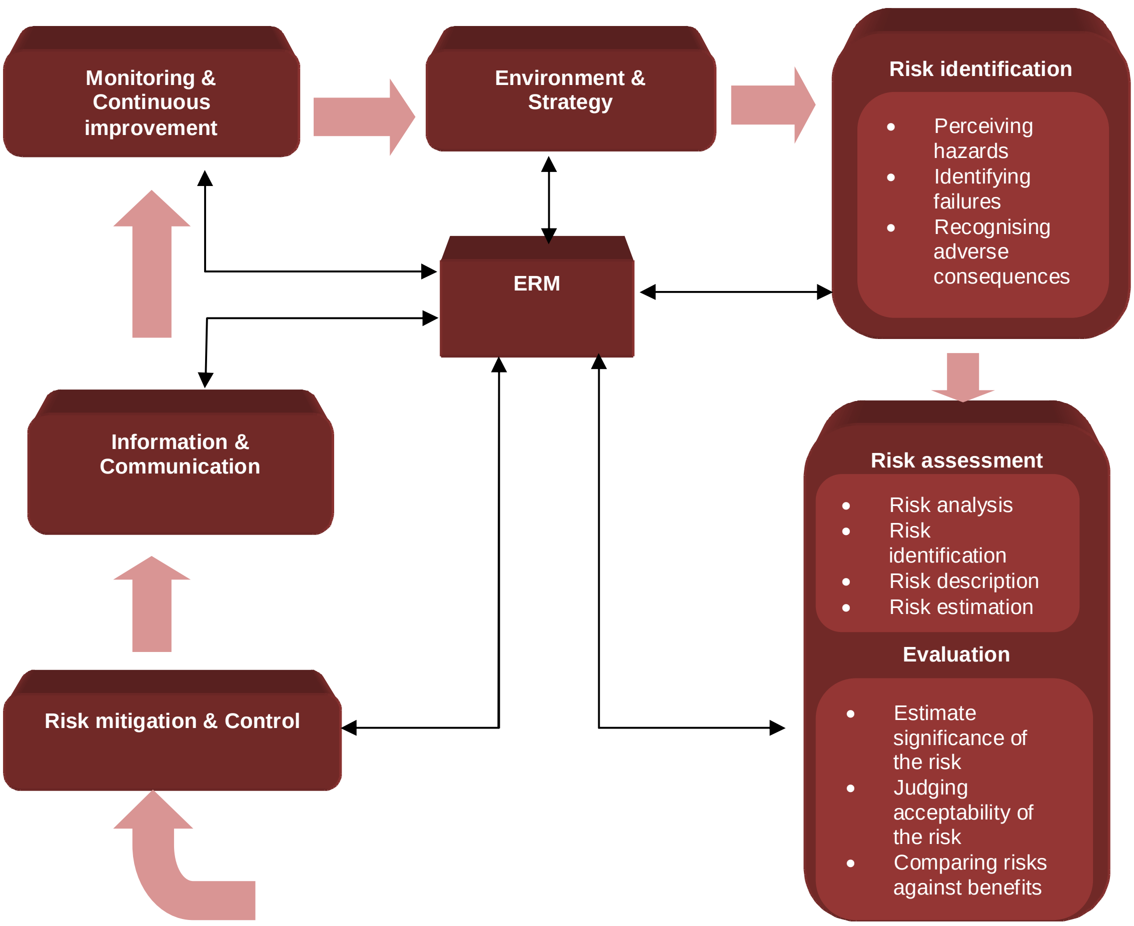

Figure 3.6: The enterprise risk management process (**Source**: Adapted from White, 1995:36; and Funston, 2003:61).

The six activities representative of the ERM process are elaborated upon in detail below.

3.6.3.1 Activity one - environment and strategy

The essential first step in the ERM process is the evaluation of the external and internal environment in which the organisation operates, with the internal environment encompassing the organisation's strategy for achieving its objectives, the organisational culture including internal controls, and the risk appetite of the organisation (Funston, 2003:60-62). An important element of the ERM process is the internal control environment as deficiencies in this environment are often the cause of risk and control breakdowns (Funston, 2003:60-62). The internal control environment consists of an organisation's and the employees' ethical values, management's operating style, and philosophy and the assignment of authority and responsibility (COSO, 2004:Online).

3.6.3.2 Activity two - risk identification

The next activity in the ERM process is the development of a risk identification framework (Funston, 2003:60-62), where the organisation's exposure to uncertainty is identified (FERMA, 2003:Online). The identification process requires in-depth knowledge of the organisation, along with various factors such as the organisation's market, the environment (legal, social, political and cultural), a thorough understanding of the organisation's strategic and operational objectives, the organisation's critical success factors and the threats and opportunities that may impact the achievement of these organisational objectives. A useful tool in the identification of the information is a SWOT analysis, a matrix conducted by the organisation by which **S**trengths, **W**eaknesses, **O**pportunities and **T**hreats are identified. Risk identification is a meticulous process, and an organisation should ensure that all significant organisational processes are identified and that all the risks originating from these processes are defined. Furthermore, any volatility related to these processes should be identified and categorised (FERMA, 2003:Online; and DEAT, 2006:Online).

In the risk identification phase, both internal and external events that may impact an organisation's objectives should be identified, along with the risk or opportunity it represents. Value creating opportunities are channelled back to management's strategy or objective-setting process (COSO, 2004:Online). Management's attention should not be focused solely on risks that result in organisational failure or crisis, but also at events that influence the effectiveness and efficiency of the organisation's activities, and have a significant impact on the organisation's performance or risk profile. Furthermore, management should take cognisance of the nature of risk, i.e. its interconnectedness. Potentially all activities in an organisation are exposed to risk, although the impact of the risk may be influenced by actions taken by other parties in the organisation (Ritchie & Brindley, 2007:310).

The development of a risk framework and a generic risk language to foster better risk understanding, is a main characteristic of the ERM approach (Selim & McNamee, 1999:159-174). In helping to identify key risks to the organisation, workshops may be facilitated, where unrestricted information sharing and debate are encouraged. This can provide valuable information in the identification, assessment and management of risks (Hodge, 2002:18-22).

3.6.3.3 Activity three - risk assessment and prioritising

Risk evaluation methods usually encompass the determination of risk impact and the probability or likelihood of risks occurring. A weighting should be allocated to risk impact and risk probability (Funston, 2003:60-62).

Although risk probability and risk impact are two important factors to consider, it is usually not enough. It is argued that estimates of probability are only relevant for risks that have already occurred, meaning risks which have a history. Basing reliance on such risk analysis may give an organisation a false sense of security as these organisations rarely prepare themselves for relevant high impact, low likelihood risks which may have the most destructive consequences. For high impact, low probability risks, the organisation's state of risk preparedness are very important. The organisation should allocate its resources based on the potential risk impact and its ability to manage such risks. The focus is therefore not to address all possible sources of risk. For example, it is impossible to anticipate all sources of risk to an organisation's computer network, but it is possible to address the degree of disruption caused by the risk of say a network failure and the organisation's preparedness to address it (Funston, 2003:60-62). The next step is risk prioritisation, which usually involves a risk matrix of risk probability and risk impact, with the results categorised as high, low or medium risks (Page & Spira, 2004:33-34).

During the risk description process, the identified risks should be depicted in a structured format such as a table. An adequately designed table can facilitate the description and evaluation of risks, and furthermore help to ensure a comprehensive risk identification, description and assessment process. By assessing each risk according to probability and impact, key risks can be prioritised for management action. Risk management should be incorporated in the initial start-up phases of projects, and continued throughout the project (FERMA, 2003:Online). Most organisations recognise the importance of incorporating an ERM process in their organisation, as it helps in the analysis of information, and translates the information into value-adding activities (Chapman, 2001:33).

Quantitative, semi-quantitative or qualitative risk estimation methods may be used in terms of risk likelihood and impact. After the completion of a risk analysis, the estimated risks should be compared against the organisation's risk criteria in terms of socio-economic and environmental factors, stakeholders' expectations, legal requirements, etc. Risk evaluation therefore considers the impact of risk on the organisation, and the manner in which it should be treated (FERMA, 2003:Online).

After the risk evaluation and prioritisation process, an enterprise-wide risk register should be developed to ensure that ERM is applied consistently throughout the organisation and a uniform understanding is achieved by all (Fraser & Henry, 2007:395).

3.6.3.4 Activity four - risk mitigation and control

The next step in ERM is risk mitigation and control. The organisation should apply risk tolerances for each situation that affects the organisation according to its 'risk appetite'. Cognisance should be taken of the interrelationships of risks when risk treatment situations are considered (Funston, 2003:60-62; and DEAT, 2006:Online). There are various definitions of risk control, as reflected in Table 3.1. Although different terms are used, the meanings are basically the same.

Table 3.1: Risk control terms used (**Source**: DEAT, 2006:Online).

TERMS USED IN RISK CONTROL		**MEANING**
Finance	**Risk management**	
Decline	Elimination	Some risks can be avoided by not entering into or stopping the activity, or refraining from performing specific hazardous activities
Accept	Acceptance	Where the risk return properties are acceptable or low risk outcomes can be expected, the risk exposure is accepted
Mitigate	Reduction/mitigation	Where action can be taken to reduce the impact of the risk(s) to an acceptable exposure level
Manage	Transfer	Where specific control activities are applied to minimise risk exposure, through transferring or outsourcing the risky activity to another party

3.6.3.5. Activity five - information and communication

Organisations have begun to realise the importance of regularly gathering risk information within the organisation as well as the significant amount of effort required for the maintenance of a risk information system. ERM enables organisations to use this risk information to identify possible risks resulting from an organisation's decisions, and to proactively address such risks. A risk information system requires effective processes, an appropriate infrastructure, accurate information, and timely reporting in order for management to make informed decisions (Funston, 2003:60-62).

3.6.3.6. Activity six - monitoring, reporting and continuous improvement

To successfully manage risk, continuous risk tolerance and risk threshold monitoring are required. By continuously monitoring situations, problem areas can be identified timeously before they escalate into a crisis situation. ERM can facilitate improved governance through the use of key metrics, and a reporting system to gauge the effectiveness of risk management processes (Funston, 2003:60-62; and DEAT, 2006:Online).

The ERM process should be driven by executive and senior management. They should ensure that an organisation's structure, along with ERM implementation policies, is in place to support the ERM process. A two-way risk information flow should be established between those closest to the risk and senior management. Risk information will help senior managers formulate the organisation's risk policy, and those closest to the risks should be empowered to take action to prevent a small risk from escalating (Dickinson, 2001:364).

3.7 ENTERPRISE-WIDE RISK MANAGEMENT FRAMEWORKS[55]

DeLoach EWRM (DeLoach, 2000:5-8), COSO's ERM (COSO, 2004:Online), the Australian/New Zealand Risk Management Standard 4360:2004 (AS/NZS 4360, 2004:Online) and the Federation of European Risk Management Associations (FERMA, 2003:Online), all claim to go beyond the traditional risk management focus. These frameworks focus on all organisational activities where risks can be created, therefore a holistic risk management approach. These frameworks all proclaim to have a link to strategy and strategic risks. This is a sound dispensation considering the importance of addressing risk during the strategy formation process as the impact of such risks can have organisational wide repercussions. The frameworks therefore go beyond the traditional narrowly-focused risk approach, and incorporate all types of risks such as strategic risk, operational risk, compliance risk, financial risk, etc. However on evaluation of these frameworks, it becomes clear that the focus is primarily limited to strategy implementation, strategic risks and traditional technical-economical processes. The frameworks fail to address new business and growth opportunities, and no guidance is given regarding the risk evaluation and communication process, i.e. the prioritisation of key risks, and the communication of these risks horizontally and vertically to all levels in the organisation; in particular to those who are ultimately responsible for decision-making (Henriksen & Uhlenfeldt, 2006:107-109).

3.7.1 The four frameworks

The enterprise risk frameworks proclaiming a link to strategy according to Henriksen and Uhlenfeldt (2006:111-126) are:

- DeLoach's Enterprise-Wide Risk Management (EWRM) - Strategies for Linking Risk and Opportunity (DeLoach, 2000:1-244). The focus of this document is directed at definitions, specific guidelines on risk identification, risk assessment and various methods of risk control.

[55] Reference to ERM 'frameworks' incorporate ERM 'standards'.

- The Committee of Sponsoring Organisations of the Treadway Commission (COSO) - Enterprise Risk Management Integrated Framework (COSO, 2004:Online). Represents a framework structure, recommendations for key risk management activities and guidelines for internal support.
- The Institute of Risk Management (IRM), the Association of Insurance and Risk Managers (AIRMIC) and the National Forum for Risk Management in the Public Sector (ALARM) combined efforts in the formulation of a risk document labelled FERMA (2003:Online), which provides a framework as a generic guideline for ERM.
- The Australian/New Zealand Risk Management Standard 4360 (AS/NZS 4360, 2004:Online) comprise in-depth commentaries and various application techniques regarding ERM.

All four frameworks follow a similar methodology regarding risk identification, assessment and risk response. By following the standards set out in the models, management can improve the quality of its strategic, tactical and operational decisions.

3.7.1.1 Generic six-stage risk model

The risk management processes in the four frameworks can be juxtaposed into a single generic model (Henriksen & Uhlenfeldt, 2006:113-114), consisting of six clear identifiable stages, which are elaborated upon below:

- **Stage 1 - objective setting:** The organisational objectives and the risk management processes are aligned to the organisation’s vision, mission and objectives, and formulated by executive management.
- **Stage 2 - risk identification:** Management should identify internal and external events resulting from organisational actions and decisions that have a potential impact on the achievement of the organisational objectives, and the execution of the strategies. Various identification techniques such as industry assessment, scenario analysis and capability analysis may be used.

- **Stage 3 - risk assessment:** Events are evaluated in terms of a classical risk evaluation model, where the probability of the risk occurring and the impact of the risk on the achievement of the organisational objectives, are measured.
- **Stage 4 - risk response:** Based on the risk analysis, events are prioritised along with the determination of risk responses such as risk avoidance, risk reduction, risk transfer or risk acceptance.
- **Stage 5 - action planning:** Action plans are formulated and implemented in line with each risk response. Accountability is enforced through the appointment of risk owners.
- **Stage 6 - control activities:** The development and implementation of control actions should be initiated to ensure effective and efficient execution of the risk response.

Risk management processes should not be seen as a sequential once-off process, as all activities influence each another. Due to the evolving and dynamic business environment, previously defined risk actions and responses can become obsolete and new risks may culminate from business activities. The evolving risk landscape necessitates the need for constant monitoring and effective risk communication.

3.7.1.2 Mapping organisational strategy to the four ERM frameworks

According to Henriksen and Uhlenfeldt (2006:114-124), the logic behind the focus on enterprise-wide risk is to transform risk management into a cross-functional activity, where risk identification, assessment and management are tied to the achievement of the organisational objectives on all levels. ERM provides a platform for the development of a common risk language, and the sharing of risk information across all organisational levels and areas. The four frameworks provide a holistic perspective on the organisational risk portfolio addressing the interrelatedness of risk, thereby contributing towards coordinated risk responses. The frameworks aim to influence organisational direction, i.e. strategy formation and do not limit their focus solely on strategy implementation.

The four frameworks claim to address the tangent planes between risk management processes and organisational strategy. DeLoach's EWRM framework (DeLoach, 2000:93-96), recognises that risk management should be incorporated into strategic activities at an early stage and also link risks to strategy formation. Although the importance of the tangent planes between risk management and strategic management are recognised by the other three frameworks, these limit risk activities to risk identification, evaluation and management of risks, that impact predetermined organisational objectives and strategies. As a result, the focus is limited to strategy execution.

In all four frameworks, the focus of risk management activities can be mapped to the achievement of predefined objectives and strategies within operational-tactical areas. Notwithstanding, the frameworks make limited reference to the process of risk consolidation, i.e. the identification, quantification, incorporation of risks in a risk framework, the risk prioritising process and risk communication process to key decision-makers. An effective risk consolidation process forms the underpinning foundation in the formulation of good strategic decisions, and guides the organisation in efficient resource allocation.

The strategic focus character of integrated risk management frameworks, relating to both 'loss avoidance activities' and 'value-adding opportunities', are frequently addressed by such holistically focused frameworks. Although all four frameworks claim to incorporate opportunity, only AS/NZS deals with it dynamically, while the other frameworks' focus is directed towards negative risk and loss avoidance. Such focus is however of little value if growth opportunities and strategy formation are not considered simultaneously. Only the Australian and New Zealand standard allows the inclusion of strategy formation in the strategic process, due to the standard's neutral stance regarding the strategy process.

According to Henriksen and Uhlenfeldt (2006:125-126), all four frameworks contribute to the refinement of risk management by striving to establish an integrated risk platform. By using any one of these frameworks, organisations can establish a common risk management platform and by using a common risk language, they can communicate and manage risks throughout all organisational processes and levels. These attributes of creating a risk platform, establishing a common risk language and communication throughout all levels, activities and processes, are important preconditions to the claim of 'holistic risk management'. To substantiate the claim of enterprise-wide risk management, these frameworks should address all processes in an organisation where key risks can be created. This includes the strategy process from the formation of strategy, to strategy choice, to the implementation of strategy.

3.8 VALUE-ADDING ERM

Embedding ERM into an organisation holds many advantages. Bowling *et al*. (2003:16-22) supported by Bowling and Rieger (2005:26), states that the primary benefits from implementing an enterprise risk management approach are:

- ERM increases the confidence of stakeholders and investors by improving good corporate governance processes.
- ERM also helps the organisation to focus its risk effort on key business risks reducing the overall cost of risk management.
- ERM enhances communication, thereby creating a better understanding and recognition of risks throughout the organisation.
- ERM can lead to an increase in revenue without increasing risk through the organisation's better understanding of the interdependencies between the various risks and their potential impact on the organisational strategy.
- Successful ERM practices reduce the overall risk profile, which lowers the cost of capital.

- ERM leads to a better allocation of capital, consistent with the organisational risk profile.

It has been recognised by various authors such as DeLoach (2000:40), Liebenberg and Hoyt (2003:37-52), Funston (2003:59-63), Chapman (2003:30-35), and Schrøder (2006:65), that the risk management process considers both the 'negative side' of risk as well as the 'positive side'. ERM helps organisations improve their decision-making by incorporating risk management into their planning activities, thereby improving the shareholder value. Holistic risk management helps an organisation understand and proactively manage risks, as it provides a common methodology whereby the magnitude of risk can be determined and the risk interactions assessed. The established ERM platform improves flexibility and speed as well as enhancing risk awareness (Schrøder, 2006:66). Since organisations are better positioned to identify risks impacting on their strategic direction, they can implement actions that will enhance their chances of success, thereby securing a competitive advantage over their rivals (Kubitscheck, 2000:39). This strategic advantage is also addressed by COSO (2004:Online) and Abrams *et al.* (2007:221), recognising that integrated risk management fosters improved information gathering and risk identification on a higher organisational level. This leads to improved risk responses, i.e. risk avoidance, reduction, sharing, and acceptance, that are aligned to the organisational strategy. It is argued that integrated risk management fosters improved risk awareness that leads to improved operational and strategic decisions (Liebenberg & Hoyt, 2003:38).

COSO (2004:Online) recognises that value is optimised when management aligns strategy and objectives, and effectively allocates resources to achieve an equilibrium between growth, return and related risks. ERM according to COSO (2004:Online), encompasses:

- **Aligning risk appetite and strategy:** In selecting the most appropriate strategic action, management takes cognisance of the organisation's risk appetite, thereby developing effective risk management mechanisms.

- **Reducing operational volatility:** ERM enables organisations to develop improved capabilities to identify potential risks and determine risk responses, reducing surprises and associated costs or losses.
- **Identifying and managing multiple and cross-enterprise risks:** ERM helps organisations identify composite risks impacting on their objectives, as well as improving risk responses.
- **Seizing opportunities:** A holistic perspective enables management to identify and proactively realise opportunities.

In addition according to Funston (2003:60), ERM helps an organisation:

- In improving the execution of its business plan through an improved understanding of the nature of risks, and how these impact on organisational objectives.
- In instilling confidence with the organisation in its ability to execute its business strategy.
- In providing reasonable assurance about the reliability and effectiveness of key risk management processes and to determine the achievability of organisational objectives.

Proponents of ERM are *ad idem* that implementing ERM in an organisation holds numerous advantages such as lowering earnings and stock-price volatility, decreasing external capital loss, increasing capital, creating synergies between risk management activities, improved decision-making, increased transparency and speed, process robustness, risk mitigation, avoidance of reputation damage and increased accountability which in turn increase investor confidence and add value to shareholders (Cumming & Hirtle, 2001:1-17; Lam, 2001:16-20; Meulbroek, 2002:56-70; Miccolis & Shah, 2000[56] cited by Liebenberg & Hoyt, 2003:38; COSO, 2004:Online; and Abrams *et al*., 2007:222-224).

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[56] Refer to footnote 51.

ERM holds value for publicly traded and non-publicly traded organisations alike. In contrast to shareholder value that features in publicly trading organisations, the ERM benefits for non-listed companies are directed towards providing management with information regarding cash flow risks or stakeholder risks. Regardless of the organisational form, ERM can serve as an important management tool (Miccolis *et al*., s.a.:xxviii).

ERM helps an organisation meet its vision (COSO, 2004:Online). By embedding ERM in an organisation, management can ensure that all significant risks are identified and addressed, and that organisations will have the confidence to view risk as an opportunity to add value (Bowling *et al*., 2003:17).

3.9 IMPEDIMENTS TO EFFECTIVE ERM PROGRAMMES

From the aforegoing analysis, the analogy can be drawn that ERM is a value-adding process, however certain limitations do exist. Inherent limitations such as faulty judgement, the determination of the cost-benefit analysis between risk and control, errors, circumvention of controls and control overriding preclude management from absolute certainty in the achievement of the organisation's objectives (COSO, 2004:Online).

Adopting an ERM approach brings about an organisational culture change that, to ensure success, requires support from top management, including the board (Merkley, 2001:25-27; Dickinson, 2001:360-366; Smiechewicz, 2001:21-27; Meulbroek, 2002:56-70; Chapman, 2003:30-35; Truslow, 2003:Online; Barrese & Scordis, 2003:26-29; and Schrøder, 2006:66). It is the responsibility of the board to determine the risk appetite and formulate the risk management policy of the organisation in guiding the organisation's risk activities. However, the board's (perceived) insufficient risk management knowledge and its compromising attitude (Weinstein, Blacker & Mills, 2003:Online; and Schrøder, 2006:67) may be a key obstacle to ERM, as it impedes in-depth and open risk discussions.

Another potential barrier to ERM could be management's priorities (Merkley, 2001:25-27; and Schrøder, 2006:67), as well as its reluctance to discuss sensitive information in different organisational units (Funston, 2003:59-63; Kleffner, Lee & McGannon, 2003:53-73; and Schrøder, 2006:68). To overcome these obstacles, top management should assume ownership of the ERM process by having a visible ERM champion who actively supports the process in order to ensure buy-in from lower level employees and to foster a 'positive tone' at the top regarding risk management. This positive risk mentality should filter down through the organisation and create a strong and positive risk management culture in support of the risk management process (Chapman, 2001:30-37; and Schrøder, 2006:67). However, if employees are of the opinion that the delegated risk management responsibilities are deemed to impact negatively on them if difficulties are encountered, they would be inclined to be less open and honest about potential weaknesses (Skinner & Spira, 2003:28-35).

A further barrier to EMR activities stems from the uncertainty about how ERM adds value to an organisation (Kleffner *et al*., 2003:53-73). To overcome this, strong support for risk management activities, along with clearly defined and communicated expectations of the value the organisation aims to derive from the ERM process, is crucial in establishing a strong risk culture (Prince, 2000:21-23; Barrese & Scordis, 2003:26-29; and Schrøder, 2006:67).

Successful risk management is underpinned by a stable and predictable reporting structure, where risk responsibilities are clearly defined and allocated to appropriate personnel (DeLoach, 2000:91-103; Chapman, 2001:30-37; and Schrøder, 2006:68). However, modern organisations with a 'flatter' organisational design hold a challenge to risk management, in that such structures are incompatible with the 'tight', hierarchical reporting systems required by ERM (Weinstein, 2002:Online; and Schrøder, 2006:68).

A further prerequisite to ERM success, is that executive management must assume primary responsibility for risk management in its respective areas (DeLoach, 2000:236-240; Truslow, 2003:Online; and Schrøder, 2006:68). However, the complex nature of risk management requires expertise that is best utilised if placed in one organisational unit that is responsible for supervising the process. This will ensure continuity of risk management actions, as well as consistency in application (Nakada & Tange, 2003:30-31; and Haubenstock, 1999[57] cited by Schrøder 2006:68). In practice, this is difficult to implement as specialised knowledge, skills and experience are required for such a unit (Haubenstock, 1999[58], Sadgrove 1996[59], cited by Schrøder, 2006:68), as well as a more active organisational role that goes beyond traditional consultation activities, which may be in contrast to the current organisational culture (Schrøder, 2006:68).

To be successful, ERM should be aligned (as close as possible), to the management teams in the various units as this alignment aids in improving their understanding of the business functions they support (Truslow, 2003:Online; and Schrøder, 2006:67). Further key elements for ensuring ERM success is the alignment of the risk management strategy with the organisation's overall business strategy, and the integration of risk management into the organisational processes, as risks are the best managed as close as possible to the source of the risk (Chapman, 2001:30-37; Smiechewicz, 2001:21-27; and Schrøder, 2006:68-69).

Each employee interprets and understands business risks differently, which necessitates the formulation of a common risk language to ensure that risk is viewed in a consistent and similar way by all parties in the organisation (Chapman, 2001:30-37; Smiechewicz, 2001:21-27; and Schrøder, 2006:69). A major obstacle in ERM implementation is the

[57] Haubenstock, M. 1999. Organizing a financial institution to deliver enterprise-wide risk management. *The Journal of Lending & Credit Risk Management,* 81(6):46-52.
[58] Refer to footnote 57.
[59] Sadgrove, K. 1996. *The Complete Guide to Business Risk Management*. London: Grower.

absence of a common risk language, which supports discussions around risks, both holistically and departmentally, and risk management methods (Nielson, Kleffner & Lee, 2005:286).

Barrese and Scordis (2003:26-29), and Schrøder (2006:69), point to the fact that risk management concepts, applications and capabilities must be imbedded into the organisation's corporate training curriculum. The importance of training and learning is emphasised by Weinstein *et al.* (2003:Online) and Schrøder (2006:69), who state that organisational and individual learning should support the ERM process.

Further obstacles highlighted by various authors to effective ERM implementation are:

- Difficulties in quantifying the risks, the wide span of the risk universe and managers' inability to understand simple risk tools (Kleffner *et al*., 2003:53-73; Bologa, 2003:9; and Schrøder, 2006:69).
- The lack of quality data, limited access to data due to inadequate integration between systems, lack of data mapping and risk modelling tools, which some authors regard as the largest obstacles in effective ERM application (Prince, 2000:21-23; Chapman, 2003:30-35; Liebenberg & Hoyt, 2003:37-52; and Schrøder 2006:69).
- The segmental approach towards different types of risks that still prevails in organisations (Levine, 2004:31-37; and Schrøder 2006:69).

3.10 RISK MANAGEMENT: CASE STUDY EVIDENCE

The results of surveys regarding the risk management practices of Danish, Western European, Asian/Pacific, North American, United Arab Emirates, United Kingdom and German companies are briefly elaborated upon below to provide the reader with substantiated case study evidence of risk management in practice.

3.10.1 Risk practices in Danish companies

Danish companies seem to favour a more fragmented risk management approach whereby emphasis is placed on the structured management of financial and hazardous risks. Operational and strategic risk management are practised on a stand-alone basis, in a less structured and formal way. In the majority of companies, boards evaluated risk types separately, limiting the organisation's risk appetite. This may be attributed to Danish company boards' inadequate risk management knowledge (Weinstein *et al*., 2003:Online; and Schrøder 2006:76), and therefore uncertainty about ERM's value-adding capabilities (Kleffner *et al.*, 2003:53-73; and Schrøder, 2006:78). This in turn leads to the low ERM priority within the country (Merkley, 2001:25-27; and Schrøder 2006:78). The most important obstacle experienced is the lack of a common risk language and the low recognition of ERM benefits. Although the process of developing and establishing a common risk language can initially be seen as overwhelming, it is surprising that a lack of a common risk language is cited as a barrier as this has to a large extent to do with defining and describing relevant risks From survey results it is evident that factors related to the risk management process such as data quality, competencies, measuring and quantification processes are seen as obstacles opposed to organisational culture aspects, such as lack of support from executive management and the availability and use of risk techniques (Schrøder, 2006:75).

The responsibility for the management, controlling and reporting of strategic and operational risks is allocated to individual business units and differ according to how units are structured. Organisations view the centralisation of the risk management function as conducive to bureaucracy and the elimination of units independence (Schrøder, 2006:79). This is in contrast to the viewpoint of Nakada and Tange (2003:30-31) and Haubenstock (1999[60]) cited by Schrøder (2006:79), that

[60] Refer to footnote 57.

one organisational unit should be responsible for the supervising of the ERM process to ensure continuity and consistency. However, the decentralised risk role is in line with the reservations of Haubenstock (1999[61]) and Sadgrove's (1996[62]) cited by Schrøder (2006:79), about a single point of responsibility, as this function requires specialised knowledge, skills and experience. As a result, the view by Schrøder (2006:79) that the risk management function will be most successful when it is set up as a staff function to provide support, facilitation and co-ordination to line management.

In summary, survey evidence showed that Danish companies have not embraced holistic risk management as a management discipline due to inadequate executive commitment. Risk management is practised in silos across organisations, based on different risk types. It is furthermore evident that risk management delegation, as practiced by some Danish organisations, is practical and compatible with recommendations from various authors in that one function should be responsible for supervising the risk management process (Schrøder, 2006:70-83).

3.10.2 Risk practices in Western European, Asian/Pacific and North American companies

Survey results from the 2007 Towers Perrin Risk/Opportunity Study (Towers Perrin, 2008:Online), conducted on medium and large enterprises in Western European, Asian/Pacific, North American and other regions, show that top management recognises the value-adding benefits of risk management, and does not perceive it merely as applying to threats to operations and assets. Although top managements identify workforce skills and experience as the primary opportunity for their organisations, it is ranked with the lowest amount of management confidence in managements' ability to effectively manage workforce risks and opportunities.

[61] Refer to footnote 57.
[62] Refer to footnote 59.

The top five risks and opportunities on a global cross-industry basis (regardless of company size or geographical dispersion) are:

Risks:

- Business continuity,
- customer demand,
- competition,
- technology, and
- business development.

Opportunities:

- Employee skills and experience,
- competition,
- business continuity,
- business development, and
- customer demand.

It is evident from this study that there is not only one best approach to risk management. Organisations' perception of business risks and their risk management approach will vary amongst organisations and organisational management. Event management (risks and opportunities), should be aligned to the organisation's business strategy and its risk tolerance. However, the primary differentiating factor in successful risk management is organisational culture. The risk management process is important, but a participative workforce and an organisational culture that embraces enterprise-wide integrated risk and opportunity management contributes toward organisational success (Towers Perrin, 2008:Online).

3.10.3 Risk practices in United Arab Emirates (Dubai) companies

In a survey done on more than 100 organisations in Dubai, the United Arab Emirates, managers and executive managers identified numerous obstacles to ERM (Rao & Marie, 2007:14). Survey results were grouped into three categories, namely:

- Banks.
- Non-Banking Finance Companies (NBFC), consisting of finance companies, Islamic finance companies and insurance companies.
- Miscellaneous Companies (MISC), consisting of domestic hotels and services, trading companies and manufacturing companies.

Although executive managers of banks realise ERM's value-adding capabilities, they experience significant frustration and dissatisfaction with the current ERM practices in their organisations. The most important ERM obstacles experienced by executives in the banking category are processes, skills, tools, organisational culture, ERM costs and organisational structure. This is followed by the secondary obstacles identified by banks as time availability, intellectual capital and technology.

Companies in the NBFC category identified culture, time availability, costs, processes, organisational structure and risk tools as the largest hurdle to ERM compared to skills, intellectual capital and technology as less important obstacles. Companies in the MISC category experienced culture, time and costs as the major obstacles to ERM. From the survey results it is evident that businesses encounter several obstacles to ERM implementation, with the type and degree of obstacles experienced varying according to the types of organisation (Rao & Marie, 2007:15).

3.10.4 Risk practices in United Kingdom companies

A United Kingdom survey was conducted on over 100 companies in the oil, gas and construction industry regarding risk analysis methods used, the organisation's policy on responding to risk, and risks encountered during operations. The survey results showed that the majority of organisations are of the opinion that their organisation uses a mixture of qualitative and quantitative risk analysis techniques, with personal and corporate experience, engineering judgement, and brainstorming the best qualitative techniques, while break-even analysis and decision trees are some of the techniques best suited for quantitative use. Organisations' most frequent risk response was risk reduction by training and educating staff and improving their work conditions; then risk transfer followed by risk retention as the least used method. One of the main survey results is that current risk management practices should be further refined by allocating more resources and time to the risk management process (Baker *et al*., 1999:94-102).

3.10.5 Risk practices in German companies

In a study done (Fatemi & Glaum, 2000:4) on German firms listed on the Frankfurt Stock Exchange, respondents were required to rank the goals of their risk management efforts. The primary goal of risk management is to ensure the survival of the organisation, with the second most important goal an increase in the organisation's market value. Other important goals listed in order of importance, are:

- Influencing the behaviour of subsidiaries and organisational management.
- Adding value through increasing the organisation's profitability.
- Contributing towards a more stable cash flow.
- Reducing the volatility of earnings.

3.11 THE FUTURE OF ERM APPLICATIONS

To improve the ERM process, as well as organisational performance and employee efficiency, McWhorter, Matherly and Frizzell (2006:50-55), suggest the implementation of a Strategic Performance Measurement System (SPMS). According to the researchers, SPMS and ERM have several common characteristics such as promoting a holistic enterprise view, educating employees about strategic objectives, and alignment with corporate strategy. SPMS is linked to corporate strategy through performance measures, while ERM is linked through risk management.

Beasley *et al*. (2006:49-55), suggest clear tangent planes between the balanced scorecard as a performance measurement tool and ERM. Balanced scorecards help organisations measure their achievement of their strategic objectives, while ERM processes help management in defining events that will have a positive and negative impact on the achievement of the organisational goals.

The alignment of risks and strategy are embedded in the successful implementation of ERM, as risks and strategy are vital to strategic planning and performance assessment. Strategy is furthermore also considered part and parcel of an organisation's balanced scorecard framework as this performance measurement tool translates the organisation's mission and strategy into specific and measurable performance indicators in the four areas of learning and growth for employees, internal business processes, customer satisfaction and financial performance (Beasley *et al*., 2006:49-55).

Characteristics shared by ERM and balanced scorecard systems according to Beasley *et al*. (2006:49-55), are:

- **Strategy-aligned focus:** Both ERM and the balanced scorecard are aligned to strategy with the ultimate objective of achieving the organisation's overall strategy.
- **Enterprise-wide view:** ERM and the balanced scorecard have a holistic strategy approach by viewing risks and performance measurement on an enterprise-wide basis.
- **Focus on interdependencies:** Both processes focus on an integrated strategic approach.
- **Top-down approach:** For both ERM and the balanced scorecard to work effectively, top management must support these processes actively.
- **Consistent approach:** Both processes follow a consistent approach across all organisational levels and processes, regardless of the number of individuals involved and the extend of their experiences.

- **Emphasis on accountability:** ERM and the balanced scorecard promote individual accountability.
- **Continuous processes:** Both processes are 'continuous' in nature. The balanced scorecard focuses on continuous improvement, while ERM's focus is directed at the constant evaluation and monitoring of risks.

By integrating the balanced scorecard into the ERM process, management's focus on risk is enhanced as the new integrated process allows for a broader focus on risks by linking risk management to strategic performance measurement. The balanced scorecard process also benefits from the ERM process. The learning and growth perspective are enhanced as employees become more risk conscious through the balanced scorecard process of capturing information about risk management objectives and performance measurement. A strong risk management focus furthermore would foster a strong and improved internal business process through the risk management activities of eliminating or reducing risks within key business processes. Improved business processes would lead to improved balanced scorecard perspectives relating to customer satisfaction and financial performance. As a result, the benefits derived from such an integrated process will enhance the ERM process and increase balanced scorecard effectiveness (Beasley *et al*., 2006:49-55).

By using two separate scorecards linked to the organisational strategy, management will have an all inclusive analytical control and information system that can be utilised in the monitoring of organisational processes, and in resolving negative variances (Simons, 2000[63] cited by Calandro & Lane, 2006:34). Using dual scorecards will assist managers in spending the appropriate amount of time and attention on both performance measurement and risks. This will eliminate the business reality where managers spend a disproportionate amount of time focusing on

[63] Simons, R. 2000. *Performance Measurement & Control Systems for Implementing Strategy*. Upper Saddle River: Prentice Hall.

performance at the expense of risk management, which in turn may lead to unnecessary levels of risk taking (Calandro & Lane, 2006:34).

CHAPTER 4

A PERSPECTIVE OF SME RISK MANAGEMENT IN SOUTH AFRICA – A LITERATURE REVIEW

SYNOPSIS

Although limited in size, SMEs dominate local and international economies in numbers. The inherent characteristics of SMEs afford these enterprises the potential to absorb unskilled labour, nurture and develop entrepreneurial skills, satisfy the needs of the local market, etc. However, in the African and South African economies, these benefits are not forthcoming, due to the high failure rate of SMEs.

The impediments to SME success are numerous and varied, and include inherent organisational obstacles such as poor managerial skills and education and training; industry-related problems such as the entrepreneur's inability to understand market expectations, and poor market access; and economy-based obstacles such as interest rate fluctuations.

SME owner-managers are primarily responsible for the management of their enterprises' activities. Studies conducted confirmed SME owner-managers' ignorance pertaining to the risks their enterprises face from internal and external sources, including risks emanating from entrepreneurial actions. SME risk management techniques are primarily limited to risk avoidance actions, and to a lesser extent, risk transfer through insurance activities. Most risk activities tend to be construed reactively, thereby affecting the availability of enterprise resources in addressing these risks.

By embedding a structured approach to enterprise risk management within SMEs, potential benefits such as cost reductions, reducing the overmanagement of risks and organisational alignment towards the SME's mission and objectives can be realised.

The content of Chapter 4, along with the relative positioning of the topics, is graphically depicted in Figure 4.

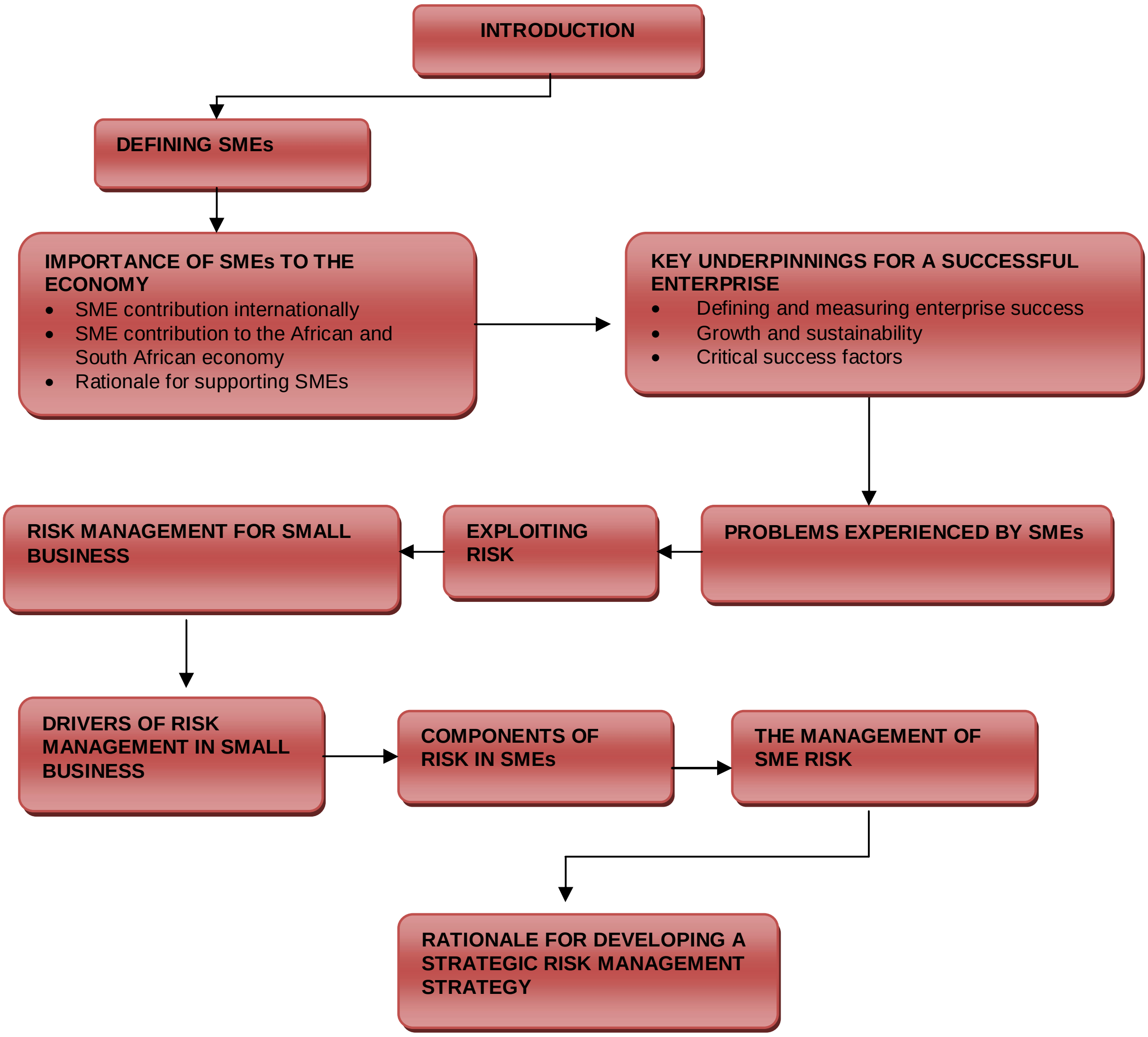

Figure 4: Detailed layout of Chapter 4 – A perspective of SME risk management in South Africa: A literature review.

CHAPTER 4

A PERSPECTIVE OF SME RISK MANAGEMENT IN SOUTH AFRICA – A LITERATURE REVIEW

4.1 INTRODUCTION

The analytical process followed thus far is graphically depicted in Figure 4.1, which places the chapters in context with the overall thesis objectives, and furthermore indicates the relative positioning of this chapter.

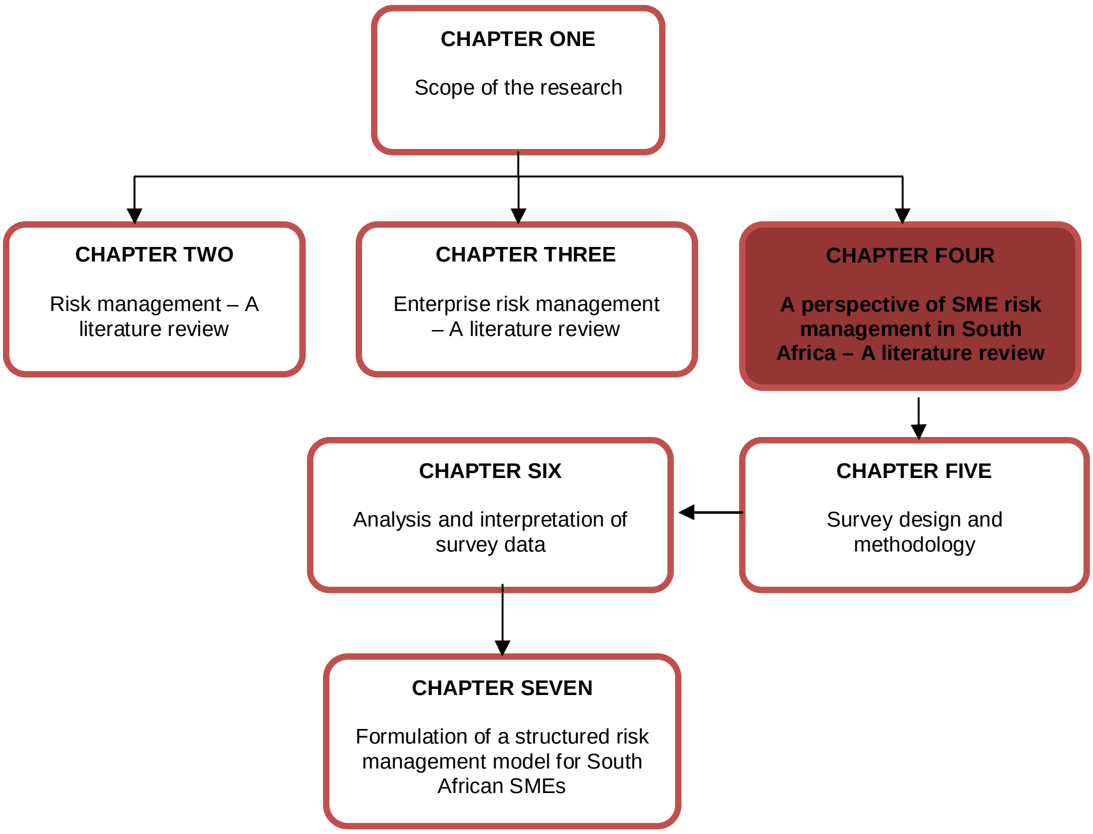

Figure 4.1: Chapter 4 - Risk management in SMEs' positioning.

SMEs operate in the same environment as their larger counterparts, but without the associated benefits such as adequate capital and extended human resources of the larger organisations (Ntlhane, 1995:112-113). SMEs encounter increasing competitive pressure fuelled by globalisation, legislation and the relaxing of trade barriers, as well as an increase in market expansion due to emerging technologies and innovation. Small and medium enterprises often flourish on their adaptability and agility such as their close proximity to their customers, their openness towards new ways of working, and their risk-taking approach, however many micro-, small and medium enterprises are susceptible to major 'external shocks' (Berry, 2002:14; and Laforet & Tann, 2006:374). Although SMEs experience difficulties in absorbing and coping with such obstacles, they need to develop the ability to deal with the organisations' ever increasing challenges, i.e. risks (Leopoulos, 2006:226).

SME owner-managers need to escalate the importance of risk management in their organisations or could suffer catastrophic consequences if they are ill prepared for the outcome of a possible risk. This calls for the requirement that entrepreneurs in SMEs need to be conversant with risk identification and analysis in order to manage risks from a diverse range of sources (Schultz, 2001:1-2). By incorporating risk management into SME operations, SMEs are better equipped to exploit their resources, thereby enabling organisations to transform an expenditure activity into an activity that can yield a positive return (Kirytopoulos, Leopoulos & Malandrakis, 2001:338-339; and Banham, 2004:68).

4.2 DEFINING SMEs

Although the term SME or SMME is used interchangeably worldwide, there is no common definition of these terms. The geographical placement of SMEs as well as country-specific legislation influences the numerous SME definitions (Leopoulos, 2006:225). SMEs encompass a broad range of organisational entities, from family businesses employing over a hundred employees (termed medium enterprises), to survivalist, self-employed entities, i.e. informal microenterprises (Berry *et al*., 2002:14).

In South Africa, the National Small Business Act, Act 102 of 1996 (South Africa, 1996:Online) amended by Act 29 of 2004 (South Africa, 2004:Online), classify small organisations into four categories, namely microenterprises, including survivalist enterprises; very small enterprises; small enterprises; and medium enterprises. The differentiating factor between these categories, excluding microenterprises, is the number of employees. For microenterprises the criterion is turnover level (Von Broembsen, 2003:Online; South Africa, 1996:Online; and South Africa, 2004:Online). Table 4.1 depicts the small organisations' category classification.

Table 4.1: Criteria for different SME categories in retail sector (**Source**: Adapted from Von Broembsen, 2003:Online; South Africa, 1996:Online; and South Africa, 2004:Online).

SURVIVALIST	MICRO	VERY SMALL	SMALL	MEDIUM
No paid employees	1 – 5 employees	Less than 10 paid employees (amended to 20 employees: Act 29, 2004)	Less than 50 employees	Less than 100 employees (amended to 200 employees: Act 29, 2004)
Income is less than minimum income level or the poverty line	Turnover less than VAT registration limit (R300 000/year)	N/A	N/A	N/A

Findings from a baseline study conducted in Africa and Latin America returned that the micro- and small enterprise sectors are far larger than recognised in most official published statistics, as inclusion to the latter is limited to registered firms. The most prevalent entity structure in SMEs is the very small enterprise (Liedholm, 2002:228-231). This is also confirmed by Berry *et al*. (2002:13-14), who emphasises that out of an estimated 1,6 million to 3 million South African SMEs, the microenterprises dominate with an estimate of 1,2 to 2,8 million businesses, thus between 69% and 80% of all SMEs are microenterprises. By analysing the composition of business activities it was identified that while many SMEs engage in trading activities, a substantial number of them are involved in manufacturing activities. Furthermore SMEs' customer networks are limited in that they sell primarily to the final consumer as opposed to other firms (Liedholm, 2002:228-231).

Various SME characteristics distinguish this sector from larger organisations, namely:

- Owner-managers are the key drivers of SMEs. In the majority of SMEs, business decision-making is done by the owner-manager (Ramsey, Ibbotson, Bell & Gray, 2003:254; and Watt, 2007:33-34). The owner's ability to determine their needs in all relevant fields is limited, and decision-making is usually guided by short-term business pressures (Leopoulos, 2006:226).
- Agency behaviour is least likely to occur in small enterprises in the SME sector, as this sector has the highest degree of ownership control, and hence limited need for other directors to exercise control functions (Bennett & Robson, 2004:97; and Watt, 2007:33-34).
- In comparison to larger organisations that satisfy an expressed reliable demand, SMEs address customers' expressed demands as well as uncover their unexpressed needs (Salles, 2006:229).
- SME decision-makers constantly encounter situations where they are required to make decisions at different levels and with varied implications (Leopoulos, 2006:226; and Salles, 2006:229).
- Larger organisations have a structured approach to problem-solving, while SMEs deal with problems as they arise and in a tacit way (Leopoulos, 2006:226; and Salles, 2006:229). This unstructured method allows for quick decision-making in order to follow opportunity (Leopoulos, 2006:226).
- SMEs usually deploy financed-based, informal and unstructured performance measure systems to provide feedback on the quality of decision-making (Hudson, Lean & Smart, 2001:804-813; and Leopoulos, 2006:226).
- SMEs rarely have a coordinated approach to guide their interactions with their environment, in contrast to larger organisations that usually

have well-defined procedures directing the company (Salles, 2006:229).

- The SME owner-managers ‘own’ most of the risk as they are usually the main or sole suppliers of operating capital (Watt, 2007:33-34).
- SMEs have a small number of employees with a low employee turnover (Watt, 2007:33-34).

4.3 IMPORTANCE OF SMEs TO THE ECONOMY

The SME sector dominates the economy, by taking cognisance of the number of micro and small enterprises active in the economy. The research of Watt (2007:33-34), returned that there were approximately 4,3 million business enterprises in the United Kingdom (UK) at the beginning of 2004. Of these enterprises, 99,3% were small (between 0 – 49 employees), 0,6% were medium sized (50 – 249 employees) and 0,1% were large (250 or more employees). Small enterprises accounted for 46,8% of employment and 37% of turnover in the UK. Furthermore, 72,8% of all enterprises were sole proprietorships and partnerships comprising solely the owner-managers, and companies with only an employee director. The turnover of these enterprises was an estimated combined £190 billion.

Another important economic influence by SMEs is their contribution to investment. Although there is limited information available on SME investment contribution, it is evident that SMEs have a very low investment behaviour compared to their contribution to employment and production. A possible argument for this behaviour is that SMEs struggle to secure sufficient finance to undertake investments, or the poor business conditions experienced by SMEs (Berry *et al*., 2002:30,79).

The importance of small businesses is recognised in numerous African countries such as Togo, Uganda, Ghana, Cote d’Ivoire, Nigeria, Kenya, Malawi, Burkina Faso as well as others. According to Harper (1984[64]) cited by Rwigema and Karungu (1999:101-124), SMEs are dominant in numbers in most economies, First World countries and Third World countries alike. In First World countries like the United States of America and the United Kingdom, small enterprises play an important role in the economy accounting for an estimated one-third of industrial employment and a lower percentage of output (Harper, 1984:26[65] cited by Rwigema & Karungu, 1999:101-124). In Third World countries where SMEs dominate economically active enterprises, SME prosperity is considered far more important than in First World countries (Rwigema & Karungu, 1999:101-124).

4.3.1 SME contribution internationally

From experience gleaned from industrialised countries, particularly Western Europe and Japan, SMEs form an integral part of local economic development (Kesper, 2000:1). SMEs in Canada, the United States of America and various other European countries play a major role in employment creation, therefore contributing to social stability. 99% of all European Union enterprises are SMEs, employing almost 100 million people, i.e. over two-thirds of all private employment in Europe. This strong SME base, through its taxation on profit and wages, provide support (through their monetary contributions) to the social needs of European countries. Although medium enterprises feature in SMEs, the overwhelming majority (over 90%) of SMEs are microenterprises with fewer than ten employees (European Commission, 2003:Online). It is of interest to note that inequalities do exist amongst SMEs with some SMEs flourishing in the current economic climate, while others are struggling to survive. Furthermore, growth rates for smaller enterprises are higher, however their probability of survival is lower (Berry, 2002:10-11; and Leopoulos, 2006:225). In East Asian countries, especially Japan, Taiwan and Korea, SMEs have a significant influence on the economy. Japanese

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[64] Harper, A. 1984. *Small business in the Third World*. New York: John Wiley.
[65] Refer to footnote 64.

SMEs play a pivotal role in the economy, principally through subcontracting with larger organisations. In Taiwan, SMEs play an important role in the economy by themselves, without the dependency on larger organisations such as in the Japanese SME sector. Internationally, the best performing economies, specifically Taiwan and Hong Kong, are predominantly based on small enterprises. Research has shown that where SMEs play a major role in the economy, both growth and income distribution performances are positively influenced (Berry, 2002:10-11).

In Latin America, SME performance over the next two decades will be crucial to improve the current economic performance. The importance of the SME sector in Latin America is due to:

- The high income inequality in most of the countries in Latin America coupled with a disproportionate share of capital invested in the large scale sector with minimum employment created by this sector, while the rest of the labour force has a lower capital labour ratio to work with.
- Slow economic growth that characterised the economy over the last few years.
- Greater market openness and a greater role for the market in the allocation of resources.
- A higher degree of fiscal prudence to keep inflation within target levels.

A high degree of similarity exists between South Africa and Latin America, and as a result, the same level of importance can be attributed to the South African SMEs in the local economy (Berry, 2002:5).

SMEs can make an important contribution to a country's economic performance, whether it is the United States of America (Audretsch, 2000: Online), Japan (Urata & Kawai, 1998[66] cited by Berry, 2002:10),

[66] Urata, S. & Kawai, H. 1998. *Technological Progress by Small and Medium Enterprises in Japan*. Paper prepared for the June 11,12, 1998 World Bank Workshop on Small and Medium Enterprises.

developing East Asia (Berry & Mazumdar, 1992[67] cited by Berry, 2002:10), Africa (Mead & Liedholm, 1998:61-74), or Latin America (Berry, 2002:10). The important role in a country's economy is attributed to SME flexibility and ability to innovate (Gunasekaran, Forker & Kobu, 2000:316-335), as well as the potential to provide employment opportunities and support large-scale manufacturing enterprises (Tan, Smith & Saad, 2006:239).

4.3.2 SME contribution to the African and South African economy

The importance of SMEs to a country's economy (Ntsika, 2001:Online; Kuratko & Hodgetts, 2007:5-8; and Hisrich & Peters, 2002:15[68] cited by Watson, 2004:15), is well-documented. The activities of SME enterprises in Africa (McGrath & King, 1999[69] cited by Rogerson, 2001a:267), are of vital importance to the promotion of economic growth, job creation and the mitigation of poverty. However, research conducted on SMEs in Africa by Mead and Liedholm (1998:61-74), confirmed that on average there are more SME closures than expansions, with approximately only 1% of microenterprises growing from five or less employees to ten or more. It has long been debated that SMEs are pivotal to employment creation and economic growth, particularly in countries with a high unemployment rate, such as South Africa, estimated at up to 40% (Friedrich, 2004:51; and Watson, 2004:15).

Upgrading the role of the SME sector in the South African economy to improve economic growth through increasing competitiveness, generating employment and redistributing income (Berry *et al*., 2002:1; Kesper, 2002[70] cited by Rogerson, 2004:765; 2006:54-55; and GCIS, 2002:Online), have been the focus of new development policies since the democratic transition (Rogerson, 2004:765; and Rogerson, 2006:54-55).

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[67] Berry, A. & Mazumdar, D. 1992. Small-Scale Industry in East and Southeast Asia: A Review of the Literature and Issues. *Asian-Pacific Economic Literature*, 5(2),September.
[68] Hisrich, R.D. & Peters, M.P. 2002. *Entrepreneurship 5th Edition*. New York: McGraw-Hill.
[69] McGrath, S. & King, K. 1999. Enterprise in Africa: new context; renewed challenges. [*In*: King, K. & McGrath, S. (ed.). *IT Publications*, 1-12, London].
[70] Kesper, A. 2002. *Tracing trajectories of successful manufacturing SMMEs in South Africa*. Unpublished PhD dissertation. University of the Witwatersrand, Johannesburg.

The South African Government tabled the National Small Business Act of 1996, amended by Act 29 of 2004, to provide equal standing to SME enterprises (Rwigema & Venter 2004:315; and Ntsika, 2001:Online) in South Africa's economy. The vital role played by the SME sector in the South African economy in addressing sustainable development, was highlighted by the 2003 Human Development Report (UNDP, 2003:5-16) for South Africa (Rogerson, 2004:765).

In South Africa, it is estimated that 90% of all formal businesses are small, medium or microenterprises (Rwigema & Karungu, 1999:101-124). The SME sector is one of the largest contributors to the South African economy. In 1995, SMEs contributed 32,7% to South African GDP and 44% to employment. This increased to a 36,1% GDP contribution in 2001, and a 53,9% employment contribution (Ntsika, 2001:Online; and Friedrich, 2004:51). The SME is not only seen as an employment creator, but also acts as an absorbent of retrenched people coming from the private and public sectors (Ntsika, 2001:Online). The contribution of employment (in 2000) by firm size is depicted in Table 4.2 with the contribution to GDP (in 2000) by firm size depicted in Table 4.3.

Table 4.2: Contribution to employment by firm size (**Source:** Berry *et al*., 2002:25).

DATA SOURCE USED	SURVIVALIST & MICRO	VERY SMALL	SMALL	MEDIUM	LARGE	TOTAL
Ntsika 2000, Stats SA 2000 & OHS* 2000	Informal:	'micro formal"				
In %	26.1%	12.8%	12.1%	15.3%	33.7%	100%
No of jobs	2,705,000	1,332,003	1,252,298	1,591,046	3,488,653	10,369,000

* OHS: October household surveys from Statistics South Africa

Table 4.3: Contribution to GDP by firm size (**Source:** Berry *et al*., 2002:28).

DATA SOURCE USED	SURVIVALIST	MICRO	VERY SMALL	SMALL	MEDIUM	LARGE	TOTAL
Ntsika 2000 In % In million:R			5.8% 47,027	13.9% 112,314	15.1% 121,607	65.2% 527,070	100% 808,017

Although the SME sector is responsible for over 60% of new jobs, largely due to the emergence of new microenterprise formations, and SMEs seemingly contributing a relative significant amount to GDP and employment, it compares poorly to Asian countries, where SME employment contribution is estimated at 80% (Friedrich, 2004:51; and Watson & Godfrey, s.a:Online). Even in countries less developed than South Africa, their SME sector contributes a much higher proportion to the GDP and employment (OECD, 1997b[71] cited by Watson & Godfrey, s.a:Online; and UNDP, 2003:12). It is noted that the majority of South African SMEs are micro- and survivalist enterprises, which show no signs of enterprise growth. It seems that a 'jobless growth' strategy (Bloch & Kesper, 2000a[72],b[73] cited by Kesper, 2000:8) is followed due to inadequate firm dynamics, resulting in SMEs' conservative contribution to employment compared to other countries.

The South African Government has identified the SME sector as the means to achieve accelerated economic growth. However, this objective has not been achieved, partly due to enterprises' high failure rate of 80% (DAIL, 2004[74], DISP, 2003[75] cited by Watson, 2004:3; and Van Niekerk,

[71] OECD. 1997b. Small Business Research and Policy. Organisation for Economic Co-operation and Development. [Online]. http://strategic.ic.gc.ca/epic/internet/insbrp-rppe.nsf/en/rd00259e.html

[72] Bloch, R. & Kesper, A. 2000a. *Supporting the Small and Medium Manufacturing Sector in the Western Cape*. Unpublished report for the Council for Scientific and Industrial Research, Pretoria.

[73] Bloch, R. & Kesper, A. 2000b. *Supporting the Small and Medium Manufacturing Sector in the Highveld Production Region*. Unpublished report for the Council for Scientific and Industrial Research, Pretoria.

[74] DAIL. 2004. Daily News. [Online]. http:///www.dailynews.co.za

2005:ii) in the SME sector. As SME growth depends to a larger extent on macroeconomic growth, the abvious analogy can be drawn that the limited microeconomic growth of the past few years has inhibited SMEs' developing to their full growth potential (Berry *et al*., 2002:93; and Watson, 2004:23-27). SME failure can further be partly ascribed to the lack of management skills. South African SMEs do not aspire to corporate governance best practices such as the implementation of King II (King II, 2002:Online) and King III (King III, 2009:Online). Risk management, a component of King II and King III, is therefore also regarded as an optional organisational activity, and not as a vital component to organisational success (Van Niekerk, 2005:ii).

4.3.3 Rationale for supporting SMEs

Internationally, the economic potential for wealth distribution, economic growth and employment opportunities are recognised as value-adding capabilities of SMEs. According to Rwigema and Karungu (1999:101-124) and Berry *et al*. (2002:10), governments have been and are in the process of assisting SMEs for various reasons such as:

- SMEs have a capacity to absorb labour, which is usually drawn from the unskilled workforce.
- SMEs provide an opportunity and testing basis for the development of entrepreneurial traits such as entrepreneurship and innovation.
- SMEs employ local technology and accommodate the needs of poor people, arguably to a greater extent than the output delivered by larger enterprises using foreign technology.
- SMEs' profits are not tied to long production runs, and as a result they can produce smaller quantities of goods to regional or local markets.
- SMEs are geographically dispersed across the country, ensuring a distribution of employment opportunities.

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[75] DISP. 2003. *SMMEs failure blamed on poor management.* Dispatch Online.[Online]. http://www.dispatchonline.co.za

- Local resources such as technology, raw material, equipment, etc., are more likely to be used by SMEs, reducing the demand for foreign exchange.
- Scarce resources such as capital and managerial skills are used to a lesser extent by SMEs than larger enterprises. However, even though SMEs require less managerial resources, they do need competent management in order to survive.

4.4 KEY UNDERPINNINGS FOR A SUCCESSFUL ENTERPRISE

Although a number of research initiatives have been conducted on small enterprise success, no significant progress has been made. This can be attributed to researchers' lack of acknowledgment of problems specific to small enterprises (Curran & Blackburn, 2001:228-240[76] cited by Naicker, 2006:26; and Beaver, 2002:213), due to the uniqueness of each enterprise's characteristics, objectives and qualities, as well as the influence exerted by the type of industry (Gadenne, 1998:Online) the small enterprise prevails in. Furthermore, different perceptions surrounding the definition of success (Beaver, 2002:213; and Naicker, 2006:26), and identifying a suitable methodological approach (Watson, Hogarth-Scott & Wilson, 1998:217-238), have adversely impacted on successful research.

Research has however shown that various internal and external factors impact on small enterprise success such as competition, entrepreneurial choices and objectives, enterprise culture, education, training and experience amongst others. Prior research conducted on small enterprise success focused on either personal and enterprise characteristics or success measured in financial measures (Perrren, 1999:366-385; 2000:58-68), without agreement being reached (Watson *et al*., 1998:217-238), on enterprise success factors (Naicker, 2006:26).

[76] Curran, J. & Blackburn, R.A. 2001. *Researching the Small Enterprise*. London: Sage.

4.4.1 Defining and measuring enterprise success

Although success is often measured in terms of financial ratios such as profitability or growth figures, far more difficulty is experienced when trying to determine factors that lead to success. While there is no commonly defined measure of business success, there are general influences that impact on the success of potential enterprises (Beaver, 2002:98; Alsbury, 2001:14-38; and Naicker, 2006:27-28). The relationship between success and intentional behaviour such as management strategies, organisational objectives and personal characteristics (Gadenne, 1998:Online), and organisational characteristics such as firm size and access to finance (Wiklund, 1999:37-48), have been the topic of numerous research studies. Naicker (2006:27-28), emphasise the importance of organisational size and access to finance in that larger enterprises and enterprises with adequate financing are more likely to be successful than their counterparts.

Success factor measurement indicators were examined in Gadenne's study of small enterprises in Australia (primarily enterprises employing less than ten employees), differentiating amongst different industries including retail, manufacturing and servicing (Gadenne, 1998:Online). Statistical analysis returned unique success factors pertaining to each industry. Success in retail is positively influenced by a 'value for money' factor (Gadenne, 1998:Online), consisting of competitive pricing, quality, high sales turnover and cost reduction. Success in manufacturing was positively mapped to competitive pricing and knowledge of competitors, while in the service industry, success was positively mapped to training, inclusiveness of decision-making and job satisfaction. One common success attribute in all three industries was access to financial resources, either contributed by the owner or drawn from the organisational profits and cash flows. Regardless of the success factors mentioned, the analogy can be drawn that success measurement indicators are highly unique, cascaded down to the level of each SME owner and each organisation (Gadenne, 1998:Online; and Naicker, 2006:28-29).

According to Probst and Raisch (2005:91) and Naicker (2006:32-33), four key factors of success are proclaimed in virtually most authoritative managerial publications, namely a high growth rate, organisational ability of continuous adaptiveness, highly visionary organisational leadership and success-oriented organisational culture. However, sustainable success requires an equilibrium between these characteristics as the downfall of failed companies more often than not are attributed to excessive growth, unmanaged change, autocratic leadership and an excessive success culture (Probst & Raisch, 2005:91,101; and Naicker, 2006:32-33). Cornwall and Naughton (2003:62), measure success along different attributes, namely financial growth, growth in total employment and profits, and customer and employee satisfaction.

Kesper (2000:4-5) and Watson (2004:1-2), claim that throughout African SMEs, entrepreneurship is the most important factor for economic growth and success and not enterprise size. Entrepreneurship encompasses both personal and corporate entrepreneurship (Zhara *et al*., 2000[77] cited by Laforet & Tann, 2006:365), with the latter embodying an enterprise's innovation, influencing an enterprise's performance. Personal characteristics of the entrepreneur impact directly and indirectly on the success of the enterprise. Organisational success factors indirectly influenced by the entrepreneur (Choueke & Armstrong, 2000:236), are organisational culture, a shared value system, an inclusive environment where employees' contributions are valued, the use of core competencies and job satisfaction by the owner-manager and other employees. Entrepreneurial characteristics that are conducive to success refer to technical and mental ability, human relation capabilities, a goal-orientated approach and creativity (Simpson, Tuck & Bellamy, 2004:481-491). In a study conducted by Friedrich (2004:51) on South African SMEs, it was emphasised that a vital key to enterprise success is 'personal initiative', consisting of the owner's characteristics such as being a self-starter,

[77] Zhara, S.A., Neubaum, D.O. & Huse, M. 2000. Entrepreneurship in medium size companies: exploring the effects of ownership and governance systems. *Journal of Management*, 26(5):947-976.

having a proactive approach, specifically regarding risk management, and persistent actions. In addition to a proactive business approach, innovation and learning, goal-setting and achievement orientation were linked to enterprise success. Where SME owners follow a reactive business approach including reactive risk management practices, the enterprise was more likely to fail. The external environment also exerts a significant influence on the success of an enterprise. A successful entrepreneur is positively influenced by a combination (Simpson *et al.*, 2004:481-491; and Naicker 2006:29-32) of internal factors, e.g. knowledge, experiences and personality and outside influences of society and the environment.

According to Laforet and Tann (2006:363), innovation is a critical attribute to maintain or increase organisational market share and as a result aids in assuring enterprise survival and success. Research has shown that SMEs' ability to successfully innovate, depends on their capability to plan ahead, the existence of a clear organisational strategy, and the ability to manage strategically, which is reflected in their market-oriented approach, their willingness to learn, innovate and take risks (Georgellis, Joyce & Woods, 2000:7-17; Beaver & Prince, 2002:28-37; and Salavou, Baltas & Lioukas, 2004:1091-1112). The SME risk-taking characteristic was confirmed by a study conducted on American SMEs (Blumentritt, 2004:27-33; and Laforet & Tann, 2006:366), confirming that the most innovative enterprises were competitively aggressive and encouraged greater risk-taking.

4.4.2 Growth and sustainability

According to Fiol (2001:691-699[78]) cited by Naicker (2006:38), the sustainability of organisations is founded partly on one key attribute, namely constantly changing competitive advantage, derived from tacit knowledge, human assets and procedures. Labour markets, capital markets and product markets are some of the most important areas

[78] Fiol, C.M. 2001. Revisiting an identity-based view of sustainable competitive advantage. *Journal of Management*, 27(5):691-699.

influencing SMEs' growth (Berry *et al*., 2002:50-51). In SMEs, the owner-manager is generally tasked with the strategic decision on how to grow the enterprise. The strategic choice is based on cost comparisons, the entrepreneur's perception of the business environment and associated aspirations. Even though market conditions may be favourable (Bamberger, 1994[79] cited by Kesper, 2000:9), the entrepreneur may decide not to grow his enterprise based on the above influencing factors.

Where enterprise growth is measured in terms of turnover and employment level, the managerial choices (O'Gorman, 2001:60-75), of where to compete, how to compete and a combination of the two elements, are the primary influencing factors. O'Gorman (2001:60-75) and Naicker (2006:39) claim that research evidence indicates that high growth enterprises build on their existing strengths and limit the scope of their activities to a central skill or competencies. Research conducted on the reasons for SME growth and success (Choueke & Armstrong, 2000:227-238), identified a 'missing perspective' with a positive influence on the enterprise, namely the 'tone at the top', i.e. the culture of the organisation as practised by top management (Naicker, 2006:39-40). Technological change, innovation and entrepreneurship are seen as critical factors to enterprise growth encompassing aspects such as the personal characteristics of the owner-manager, attitudes, education and spontaneity of the entrepreneur (Berry *et al*., 2002:50-51).

Enterprises that are starting up, face different obstacles than existing enterprises seeking to grow (Liedholm, 2002:240). For enterprises not aiming to grow, or aiming to expand only a little, a small amount of working capital is needed to fulfil their needs. Research findings show that only one percent of enterprises seeking growth or aiming to grow beyond 10 employees succeed in meeting their growth objective. Research has shown that these enterprises have a higher level of human capital

[79] Bamberger, I. 1994. Developing competitive advantage in small and medium-sized firms. [*In*: Bamberger, I. (ed.). *Product/Market Strategies of Small and Medium-sized Enterprises*. Aldershot: Avebury].

consisting of experience and education, are more likely engaged in manufacturing opposed to trading, and display more complex marketing patterns than stagnating, growthless SMEs (Liedholm & Mead, 1999[80] cited by Liedholm, 2002:232). As a result, in addressing growth, attention should not solely be directed at working capital, but at the complex set of requirements needed for this purpose (Liedholm, 2002:232-236), which are expanded upon below:

- **Organisational age:** A strong inverse relationship exists between organisational age and growth, with younger enterprises generating more jobs per enterprise. However, organisational age is also attributed to closure, in that over 50% of micro- and small enterprise closures occur within the first three years of start-up. These statistics are also reflected in the Global Entrepreneurship Monitor (GEM) 2001, where statistics returned a low survival rate amongst South African start-up enterprises (Watson, 2004:1-2).
- **Organisational start-up size:** There is a strong inverse relationship between start-up size and growth, with small organisations adding more jobs per enterprise compared to the larger organisations. In South American and African micro- and small enterprises, research has shown that the small size of the organisation does not impede on organisational survival; however growing micro- and small enterprises are more prone to survive than non-growing enterprises.
- **Industry sector:** On aggregate, it appears that manufacturing and service enterprises have higher growth rates than enterprises in the trading sector.
- **Location:** Urbanised enterprises experience a higher growth rate than rural enterprises.
- **Country:** This variable also exerts an influence on organisational growth.
- **Gender of the entrepreneur:** Male-run enterprises grow seemingly more rapidly than female-run enterprises due to arguably females'

[80] Liedholm, C. & Mead, D. 1999. *Small Enterprises and Economic Development: the Dynamic Role of Micro- and Small Enterprises*. London: Routledge.

risk adversity (Downing & Daniels, 1992:21), and discrimination practices.

- **Human capital:** Research confirms that human capital has a significant influence on enterprise growth, in that SME entrepreneurs with training and prior work experience show higher SME growth than their counterparts.

SME performance therefore depends not only on the removal of obstacles through supportive public policies, but also on industrial and organisational structures, the flexibility of the enterprise and most importantly, the capabilities and vision of the entrepreneur (Kesper, 2000:1).

4.4.3 Critical success factors

Caution should be levied against viewing SMEs as smaller versions of larger enterprises, as SMEs do not in any way resemble large organisations. Generally, SMEs experience a scarcity of resources (OECD, 2002[81] cited by Wong, 2005:266-269; and Jun & Cai, 2003:192-203) such as time, financial and human resources. The nature of smaller enterprises expose them to a greater degree to knowledge loss, since larger enterprises can offer employees higher salaries, which when accepted, result in the loss of employee embedded knowledge to the smaller enterprise. Innovation should be promoted and nurtured in SMEs, where employees are encouraged to generate new ideas, knowledge and solutions, thus fostering a culture that emphasises problem-seeking and -solving (Goh, 2002:23-30) and open-mindedness (Stonehouse & Pemberton, 1999:131-144). Equally important is the organisational culture of the enterprise, whereby mistakes are viewed as an investment process that facilitates learning whereby employees have more freedom to explore new opportunities. Care should therefore be taken when developing critical success factors for SMEs, to ensure that the specific needs and situations are thoroughly understood (Wong, 2005:266-269).

[81] OECD. 2002. *OECD Small and Medium Enterprise Outlook*. Organisation for Economic Co-operation and Development, Paris.

Studies have identified a number of factors influencing enterprise expansion and success. A fundamental element (McGrath & King, 1996:Online; and Manu, 1998:6[82] cited by Rogerson, 2001a:268-270), that has a positive impact on an organisation's growth is the depth of human capital or brain power. The importance of human capital as a critical success factor was also confirmed in a study conducted on African enterprises where it was determined that successful entrepreneurs more likely have education and training beyond the primary school level (King & McGrath, 1999:13[83] cited by Rogerson, 2001a:268-270). Education and experience also have an influence on employment growth, as only a small number of SMEs will positively contribute to employment, with these SMEs characterised by highly trained and educated entrepreneurs who employ skilled labour (Kesper, 2000:8). The merit of this finding is based on the argument that entrepreneurs with a greater level of education and training are more able to adapt their businesses to the ever-changing business environment (Rogerson, 2001a:268-270). According to Rogerson (2008:70-71), in order to deal effectively with issues such as globalisation, "… strategies to improve individuals and enterprises level of knowledge and skills …" (King *et al*., 2002:28[84] cited by Rogerson, 2008:70-71), are needed as training and skills are essential for SMEs to acquire the knowledge to "… learn to grow …" (McGrath & King 1999:211[85] cited by Rogerson, 2008:70-71) and to "… move up the value chain …" (Kraak 2005:58). In the Global Entrepreneurship Monitor, authors Orford, Wood, Fischer, Herrington and Segal (2003:56), confirm the importance of education, training and experience as core elements to enterprise success. Smith and Perks (2006:17-26) and Perks (2004[86]) cited by

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[82] Manu, G. 1998. Enterprise Development in Africa: Strategies for Impact and Growth. *Small Enterprise Development,* 9(4):4-13.
[83] King, K. & McGrath, S. (ed.). 1999. *Enterprise in Africa: Between Poverty and Growth*. London: Intermediate Technology Publications.
[84] King, K., McGrath, S., Rogerson, C. & Visser, K. 2002. Learning-led competitiveness: a challenge for South African development. *Africa Insight*, 32(3):28-35.
[85] McGrath, S. & King, K. 1999. Learning to grow? The importance of education and training for small and micro-enterprise development.[*In*: King, K. & McGrath, S. (ed.). *Enterprise in Africa: Between Poverty and Growth.* London: Intermediate Technology Publications].
[86] Perks, S. 2004. The entrepreneurial skills necessary for growth of micro entrepreneurs: an empirical study. [*In*: Grundling, J.P. & Olivier, N. (ed.). *Proceedings 3rd International*

Rogerson (2008:70-71), differentiate between four types of essential skills needed to start up a microenterprise, namely:

- Personal skills,
- technical skills,
- business operation skills, and
- managerial skills.

However, taking the importance of training and skills into account, McGrath (2005a:5[87]) cited by Rogerson (2008:70-71) cautions that skills are not the only answer to the challenges facing SME development.

Improvement of the investment climate for microenterprises also hinges on enhanced access to finance for entrepreneurs (Clarke, Eifert, Habyarimana, Kapery, Kaplan, Schwartz & Ramachandran, 2006:63-76). Access to finance from banks, non-banking institutions and public institutions, is essential to SMEs, specifically the enterprises displaying the potential to grow (St-Pierre & Bahri, 2006:547). The financial need experienced by entrepreneurs differentiates according to the kind of SME and the different phases of SME development, commencing with the start-up phase through to the stable phase. It is of interest to note that SME finance needs decrease where SMEs utilise accounting records (Angela Motsa & Associates 2004:Online), such as cash books, records of accounts receivable, inventory records and active debtor management. Finance, skills, business training and less rigid regulations are the key elements to promote entrepreneurship, enhance the enterprise environment, and improve competitiveness and capacity in the SME enterprise (Rogerson, 2008:62-67).

4.5 PROBLEMS EXPERIENCED BY SMEs

SME owner-managers are most conversant with their enterprises, but are frequently not able to identify all the factors impacting on their enterprise

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Conference: Entrepreneurship in Africa Sustainable Globalisation. Pretoria: Tshwane University of Technology].

[87] McGrath, S. 2005a. *Skills Development in Very Small and Micro Enterprises*. Cape Town: HSRC Press.

activities and/or overrate the significance of external factors, while underrating internal weaknesses (Manning, 1996[88] cited by Kesper, 2000:12; and Bloch & Kesper, 2000a[89], b[90] cited by Kesper, 2000:12). This view is also reiterated by Kaplinsky and Morris (1999:717-737) and Kesper (1999b:137-164), who state that SME owner-managers believe that the primary obstacles to their survival is external to the enterprise. In contrast to these beliefs, research on technology upgrading of SMEs in South Africa (Dunne, 1999:24; Kaplinsky & Morris, 1999:717-737; Kesper 1999a:14-15; 1999b:137-159; and Kesper 2000:14-15), suggest that SMEs should devote more attention to internal weaknesses by improving their internal operations.

Entrepreneurs usually experience difficulty in identifying factors, which impede on enterprise growth (Berry *et al*., 2002:50). According to Dockel and Ligthelm (2002:2[91]) cited by Naicker (2006:17), problems experienced by SMEs can be categorised as follows:

- **Economic problems:** Problems relating to the state of the economy, e.g. employment opportunities.
- **Industry-related problems:** Problems relating to the type of industry in which the enterprise operates, which may include demand and supply factors, obstacles to entry and level of competitiveness in the industry.
- **Enterprise-based problems:** Problems relating to internal difficulties experienced by the enterprise such as resource availability, i.e. finance, entrepreneurship and the effective use of these resources.

The importance of the above three categories of problems, call for closer scrutiny thereof:

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[88] Manning, C. 1996. *Market access for small and medium-sized producers in South Africa: the case of the furniture industry*. Unpublished PhD. Thesis. University of Sussex, Brighton.
[89] Refer to footnote 72.
[90] Refer to footnote 73.
[91] Dockel, J.A. & Ligthelm, A.A. 2002. *Factors that contribute to small business survival*. Pretoria: University of South Africa.

Economy-based problems

The performance of the South African SME sector depends largely on macroeconomic conditions and industrial or market structures (Kesper, 2000:7-8). A survey on business success factors of SMEs in Gauteng (Ligthelm & Cant, 2002:19-25; and Naicker, 2006:16), returned that in the macroeconomic environment, crime was perceived as the largest problem, followed by inflation, unemployment, interest and exchange rates. SME success is tied in with the local economic conditions as the SME sector's market growth usually takes place at the same rate as the macroeconomy as a whole, therefore should there be an economic downturn, SMEs will usually also experience difficulty (Berry *et al*., 2002:85). All categories of SMEs identify declining demand levels and a lack of customers' purchasing power as one of their core constraints (Berry *et al*., 2002:86; and Leopoulos, 2006:226).

Enterprise-based problems

In surveys on Latin America and South African micro- and small enterprises, it was found that less than 50% of business closures were attributed to business failures, i.e. financial or economical infeasibility due to insufficient demand and inadequate working capital. The remainder of closures are attributed to personal reasons or the availability of better options or Government interference (Liedholm, 2002:232-234).

Internal factors such as human resource problems encompassing poor staff planning, multifunctional management, high employee turnover rate, inadequately trained employees, low productivity and difficulties in recruiting quality staff (Beaver, 2002:102; Berry *et al*., 2002:51; Williamson, 2000:27; Ligthelm & Cant, 2002:34; and Watt, 2007:34-35), are considered to be impediments to SME success. SMEs face several challenges involving the need to increase the level of human capital and assuring the effective use of such resources. It is argued that the roles of labour, labour markets and skill levels are the most important factors contributing to small enterprise growth (Berry *et al*., 2002:51). South Africa in particular is prone to underinvestment in human capital with low levels of foremen, mid-management, staff motivation skills and team-building skills. This need is reflected in SME owner-managers' response identifying human capital investment as the second most important aspect where assistance is required after market development (Berry *et al*., 2002:61-62,65).

Training and education further influence the owner-managers' perception of business success (Ligthelm & Cant, 2002:34; King & McGrath, 2002:31[92] cited by Naicker, 2006:16-17,28; and Devey, Skinner & Valodia, 2002:22[93] cited by Naicker, 2006:16-17,28), as owners with management qualifications regard their business as very successful compared to owners without management qualifications. Managerial skills not only influence owners' perceptions about their business, but various literature sources (Viviers, Van Eden & Venter, 2001:11[94] cited by Watson, 2004:1-2), acknowledge that a lack of managerial skills and training is an important cause of enterprise failure (Naicker, 2006:18), complemented by a lack of experience and a lack of organisational culture acting as an impediment to the establishment of SMEs.

In a study conducted on enterprise success factors in SMEs in Gauteng, South Africa, it was concluded that a lack of technical and managerial skills (Brink, Cant & Ligthelm, 2003:Online; and Rogerson, 2008:70-71) impedes on business development. Research conducted on SME failures in South Africa returned that failure is primarily caused by a lack of management skill and training. This finding is confirmed (Radipere & Van Scheers, 2005:409[95] cited by Rogerson, 2008:70-71), by 90% of a sample

[92] King, K. & McGrath, S. 2002. *Globalization, Enterprise and Knowledge Symposium*. Oxford: s.n.
[93] Devey, R., Skinner, C. & Valodia, I. 2002. *The informal economy in South Africa.* Johannesburg: The Development Policy Research Unit.
[94] Viviers, S., Van Eeden, S. & Venter, D. 2001. *Identifying small business problems in the South African context for proactive entrepreneurial education*. Global International Enterprise. S.l.:s.n.
[95] Radipere, S. & Van Scheers, L. 2005. Investigating whether a lack of marketing and managerial skills is the main cause of business failure in South Africa. *South African Journal of Economic and Management Sciences*, 8:402-411.

of 1 000 entrepreneurs who believe that SME failure is due to a lack of managerial skills.

The owner-manager's characteristics (O'Gorman, 2001:60-75), may also act as a barrier to growth in that the personality, managerial skills and style including the entrepreneur's and/or management's negative attitude towards change, may negatively influence an enterprise (Leopoulos, 2006:226; and Naicker, 2006:39). Other operational problems encountered according to Leopoulos (2006:226), are:

- The use of uncoordinated changes in management practices without accompanied strategic planning and continued observation (Smart, Maull, Childe & Radnor, 2004:2-12).
- Limited resources to effect improvements.
- Lower productivity compared to larger enterprises (European Commission, 2003:Online).
- Lack of organisational dynamics to grow beyond a one-person operation (Rogerson, 2004:770-771).

According to Berger and Udell (2001:Online), and Reynolds and Lancaster (2006:396-397), a high percentage of small organisations fail in the first five years of trading, often as a result of overtrading and financial strain. Access to finance as a constraint on SME development has therefore featured prominently in a number of studies. With regard to funding secured from banks, SMEs encounter various obstacles, with lenders perceiving SMEs as non-transparent in the utilisation of the funding, while SMEs complain that their business risk is overrated, resulting in harsh financing conditions impeding on their competitiveness (St-Pierre & Bahri, 2006:547). Internationally, this view is mapped in the following countries (St-Pierre & Bahri, 2006:547):

- Malaysian bankers regard SMEs as non-performers and thus exercise a cautionary attitude towards them (Rahman *et al*., 2003:Online).
- Belgium bankers regard SMEs as extremely high risk entities, given the difference between management objectives and banker

objectives (Janssen & Wtterwulghe, 1998[96] cited by St-Pierre & Bahri, 2006:547).

South African bankers are no different in their perspective of SME's as their international counterparts. South African bankers are less inclined to finance SMEs (Pretorius & Shaw, 2004:Online), due to their perceived high level of risk and a weak expected return (St-Pierre & Bahri, 2006:547). The difficulty experienced in access to finance is most prominent in micro- and informal enterprises and considered to be the main obstacle to their development (Kubheka 2006:Online[97] cited by Rogerson, 2008:62-67). This is emphasised by South African microenterprise surveys, with the inaccessibility to finance listed as one of the primary external constraints faced by SMEs. Some of the factors that contribute to the complex financing problem are insufficient knowledge of the SME entrepreneurs e.g. their inability to draw up a business plan; the lender's inability to determine the SME's credit risk attributed to a lack of enterprise information; and general communication issues (Berry *et al.*, 2002:65,68,77), leading to low levels of entrepreneurship and a high failure rate (Kotze & Smit, 2008:35; and Rajaram, 2008:62) among South African SMEs. According to Rogerson (2001b:127) and Skinner (2005:35-40), emerging African SME entrepreneurs, also experience a lack of credit as a major constraint. These entrepreneurs are dependent on personal savings or loans from relatives and friends as the source of their start-up capital. High interest rates, lack of credit history and collateral, and a complex finance application process, are some of the factors contributing to the low usage of formal bank loans.

Access to finance encompasses different kinds of finance to fulfil the varying needs ranging from long-term capital to short-term capital, to equity finance and debt finance, with longer-term finance more difficult to obtain. The inaccessibility to different kinds of finance has a negative

[96] Janssen, F. & Wtterwulghe, R. 1998. *L'influence de l'interprénétration du dirigeant et de son enterprise sur l'endettement bancaire des PME: état de la question*. Paper presented at 4ième Congrès International Francophone de la PME, Metz, France, October.
[97] Kubheka, B. 2006. Small business survey highlights.[Online]. http://www.finmarktrust.org.za.

effect on SMEs, as most enterprises need long-term and short-term finance to succeed. SME finance demand is also multifaceted due to enterprises' different needs for capital to run their operations, the different resources they can invest and the varying accessibility to external finance. A further aspect that influences finance is that financial institutions provide grants more easily to older and/or larger firms, than younger and/or smaller firms, supporting the underlying assumption that micro- and young enterprises are less creditworthy than the larger enterprises. Further research however needs to be conducted to determine if the higher failure rate is a cause or a consequence of the higher credit rejections (Berry *et al*., 2002:70,96).

Interest rates furthermore form an integral part of SME finance. Interest rates have a dualistic purpose by regulating the supply of finance as well as the demand for finance. Equalisation is effected through a risk premium that is levied on riskier loans in proportion to the perceived risk, in addition to the prime rate. This results in higher interest rates charged to the SME sector and particularly on longer-term loans (Berry *et al*., 2002:71). Accessibility and availability of finance due to inadequate credit information in the credit assessment process, SMEs' inexperience in the loan application process, and high loan transactions costs are the typical reasons for failures in SME financing world-wide (Berry *et al*., 2002:70,96).

It is therefore important to develop an effective and efficient process whereby all SME dimensions are evaluated when measuring the borrower's risk. According to Allegret in Chanel-Reynaud and Bloy (2001[98]) cited by St-Pierre and Bahri (2006:547), "… the approach adopted by the banks within the framework of their financial diagnosis is unsuitable to the context in which enterprises, in particular the SME's, currently evolve. In this way, the new financial diagnosis of an enterprise must be capable of taking into account the turbulence and recurring bumps that have affected enterprises since the early 80's". The

[98] Chanel-Reynaud, G. & Bloy, E. 2001. *La banque et le reisque PME*, Lyon: Presses universitaires de Lyon.

development of a more inclusive SME risk measurement framework will enable lenders to make rapid and objective decisions based on the actual business environment, while SME management cannot criticise the banking environment of over-valuating the risk. At present, few risk evaluation models exist which allow for an overall evaluation of SME risk. The lack of suitable risk models is emphasised by the banking sector's continued reliance on financial models where information is derived by way of financial statements, since this information is considered more objective than information obtained from other sources, as stated by the following sources:

- Lévy and Sauvage, 2003[99] as cited by St-Pierre and Bahri, (2006:548), for the quotation system of the Banque de France.
- Müller, 2003[100] cited by St-Pierre and Bahri (2006:548) for Switzerland.
- St-Pierre, 2004[101] cited by St-Pierre and Bahri (2006:548) for Canada.

These lenders, along with others, do not take into account the shortcomings of financial information. Factors that have an impact on the financial performance of an organisation include the structure of the enterprise and the quality of business practices, along with numerous other risk factors (St-Pierre & Bahri, 2006:548).

However, some studies refute the access to finance obstacle argument. Levy (1996[102]) cited by Berry *et al*. (2002:77), in a survey of 134 small South African enterprises, found that access to finance was an important but not primary obstacle, even in younger enterprises. It was identified that debt-free enterprises' debtless structure was due to either a reluctance to borrow, or high interest rates.

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[99] Lévy, J. & Sauvage, F. 2003. La cotation de la Banque de France et le ratio McDonough. *Bulletin de la Banque de France*,112. [Online]. www.banque-France.fr/fr/telechar/bulletin/etu112_1 .
[100] Müller, H.-U. 2003. *Notation interne: exemple Crédit Suisse.* [Online]. www.cvci.ch/upload/Public/Discours/Zuberbuhler03.ppt .
[101] Refer to footnote 7.
[102] Levy, B. 1996. *The Business Environment for Industrial Small and Medium Enterprises.* Informal Discussion Paper 11. World Bank, Washington DC.

Industry-related problems

According to Viviers *et al.* (2001:11[103]) cited by Naicker (2006:18,28), Huang and Brown (1999:73-85) and Watt (2007:34-35), market-related factors that exert the most negative influence on enterprise success are increased competition, limited market size, low demand, inefficient marketing, poor competitor understanding, poor location and market understanding and the inability to identify the target market. South African SMEs are hampered by a structural problem in that they, contrary to SMEs in other developing countries, do not complement larger organisations with spesialised products or services. Instead, they compete with larger enterprises in the same product markets (Qualmann, 2000:41[104] cited by Rogerson, 2004:770-771), albeit for different consumer segments.

In conclusion, the following SME problems (Berry *et al*., 2002:73; and Laforet & Tann, 2006:374) need to be addressed:

- Insufficient entrepreneurship, i.e. lack of knowledge, training, networking and skills.
- Lack of good business opportunities.
- Inadequate entrepreneurial business acumen.
- Low capital availability due to, e.g. low savings rate.
- Information availability difficulties.
- Market fragmentation and customer dependency.
- Difficulty in securing finance.
- Pressures exerted on interest rates due to default rate and the need to cover transactions costs.

For SME owner-managers, it is important to identify the most problematic areas in managing their small enterprise. By identifying the problem areas, owner-managers can address problems through education, training and information-gathering activities (Huang & Brown, 1999:73-85).

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[103] Refer to footnote 94.

[104] Qualmann, R. 2000. *Economic development and employment promotion in South Africa: analysis with special reference to SMME promotion and strategy options for the German Development Cooperation*. Unpublished report. Bonn: GTZ

4.6 EXPLOITING RISK

Successful enterprises tend to have the following factors in common (Engle, 2009:20):

- Conservative debt-equity ratios, i.e. balance sheet.
- Highly efficient cost control actions.
- Commitment and substantial investment in new technology.
- Eagerness to enter new markets which hold growth prospects.
- Dynamic business model that can accommodate change.
- An understanding of the risks impacting on the organisation.
- Procedures to deal with risks effectively.

Embedded in risk are both a negative and a positive risk factor. In the extreme form, there is a strong positive correlation between the size of the risk and the benefit to be obtained. Although this strong positive risk correlation exists, most people consciously avoid risky situations. However, by analysing potential risks, managers can extrapolate the high rewards, and the negative risk component can become relatively insignificant. According to Zeckhauser and Sandoski (2009:76-77), the following steps should be considered in exploiting risky situations:

- Key risk drivers or risk factors need to be determined.
- Not all decision-making needs to be done quickly. By experimenting the downside risk is reduced, but not the upside reward.
- A risk-tolerant environment should be created that encourages creative thinking.
- Educated risk-taking should be encouraged.

According to Plourd (2009:68-69), the importance of risk management is now escalated above issues such as long-term and short-term financing constrains. Proclaiming the existence of a risk management strategy is insufficient, enterprises need to actively engage in risk management practices to address the convergence of major risks as experienced in the current economic climate where the credit crisis risk, fluctuating commodity prices, increased Government debt, rising unemployment and declining consumer spending are impacting on enterprises, individually and combined.

The use of ERM may be viewed as a business competency enabling managers to optimise opportunities associated with risks (Hofmann, 2009:14). ERM should apply basic risk management activities, embedding the risk champion's knowledge of exposures across the entire scope of an enterprise's risks such as strategic risks, operational risks, financial risks and regulatory compliance risks (Engle, 2009:20), and should not be reduced to a process based solely on risk formulas (Bradford, 2009:4-28). ERM's effectiveness depends to a large degree on efficient and correct data collection (Banham, 2004:69). Effective ERM is enforced through forcing management to look beyond the current decisions needed to operate the enterprise and instead foster an understanding of how the enterprise can avoid or react to significant business changes impacting on it (Engle, 2009:20). ERM enables an enterprise to handle exposure to accidental losses in an economical and effective manner. A structured risk management approach enables an enterprise to pursue its strategies aggressively and efficiently, as management can anticipate the risk exposure of each activity engaged in, thus achieving more acceptable results at a reduced cost (Ntlhane, 1995:27).

4.7 RISK MANAGEMENT FOR SMALL BUSINESS

Risk and risk management are a major concern for all companies, especially small and medium-sized enterprises, which are particularly sensitive to business risk and competition (Blanc Alquier & Lagasse Tignol, 2006:273). A substantial number of larger organisations have developed a risk management culture consisting of complex procedures and executed by teams of experts. In smaller organisations such as SMEs, such integrated risk management processes do not exist (Ntlhane, 1995:106-107; and Dupré, 2009:17). In SMEs the risk management function usually resides with the owner's assessment of threats and opportunities pertaining to the enterprise (Watt, 2007:33-34). Although risk management principles are common to all types of enterprises, the owner-manager's risk perception and his attitude towards risk management influence the adequacy of the enterprise's risk management actions deployed (Ntlhane, 1995:106-107).

Implied in SME risk management is the core principle that entrepreneurial or management focus should be aimed at recognising future uncertainty, deliberating risks, identifying possible manifestations and effects, and formulating plans to address such risks and reduce or eliminate their impact on the enterprise (Ntlhane, 1995:27). One of the skills required of entrepreneurs is the ability to identify and analyse risks to ensure that advantage is taken of calculated risks (Watson, 2004:84-85). This managerial focus is of vital importance for SMEs, where risk identification and control depend on the risk personality of the entrepreneur (Ntlhane, 1995:27). Owner-managers, when considering implementing an ERM programme or evaluating existing risk procedures, should take cognisance of the following (Bradford, 2009:15):

- Are the largest risks facing the enterprise identified?
- Are risk measures in place to address these risks?
- If losses do occur despite preventative measures implemented, is the enterprise prepared to handle them?
- Is a structured approach available to create opportunities out of risks?

According to Watt (2007:36-40), SME owner-managers should consider the following steps in their risk management process:

- **Establishing an SME's risk strategy:** Threats often dominate risk discussions leading to a negative reaction of SMEs to the risk management process. It is important that a risk approach is proposed that emphasises the upside of risk, i.e. opportunities that drive innovation, instead of a rigid compilation of threats faced by the enterprise. The starting point for owner-managers is to establish enterprise objectives through the formulation of the enterprise's vision and mission. The process will be cascaded downwards through defining operational aims and targets expressed over a time period and the establishment of a risk governance framework that will address risks threatening the achievement of set goals. The risk governance framework will address the process of identifying, assessing, prioritising and managing risk, as well as risk monitoring and communication aspects.

- **Determining the SME's risk appetite:** SME resources are limited, thus every resource spent in mitigating a risk will not be available elsewhere in the enterprise. Owner-managers therefore need to determine what level of risk is acceptable to the SME before action is required by way of controls and risk treatment options to bring the risk exposure level back within the acceptable range. Setting the enterprise's risk appetite is advantageous in that:
  - It forces the enterprise to measure and compare risks and the potential for losses and opportunities.
  - It aids in determining the efficiency of resources expended on risks, i.e. resources are allocated to risks that rank above the enterprise's threshold.
  - It focuses attention on important risks above the threshold.
  - It aids in the establishment of enterprise objectives that are in line with the risk appetite of the individual SME.
  - It aids in the allocation of limited time and resources.
- **Identification and assessment of risk:** Enterprises are often created as a result of an opportunity the entrepreneur has identified. However, there are various areas of risk that may threaten an enterprise's success. The use of a structured risk identification process may identify specific risk categories, areas and topics to be evaluated, while simultaneously it provides an opportunity to identify a broader range of risks. The result is a list of threats and associated risks that may be categorised into specific categories. In the SME environment, a simplistic risk identification process should be used in answering questions such as 'What/How/Why can it happen?'. The risk identification process should build on experience, but also incorporate a forward-looking approach in trying to anticipate

possible risks that have not yet been experienced. The information can then be extrapolated from the risk identification process into a risk matrix, where risks are assessed based on the risk's probability of occurrence and the severity of the possible outcome (Watt, 2007:36-40). As the accuracy of information is of vital importance, management should strive to improve the quality of the information used in identifying and assessing risks (Foster, 2009:Online).

- **Prioritising and managing risks:** The risk assessment information is set out in relation to the risk categories ensuring a focus on high risk areas. The consolidated risks are assessed as well as the individual component parts. This enables the owner to take a measured and objective look at the enterprise to see beyond the limitations of his own area of expertise, avoiding excessive focus on minor risks. There are however limitations to the risk management process and the owner-manager should take cognisance of the following:
    - Risk assessment may be helpful in decision-making, however the quality thereof is limited to the depth of the research and the experience and skills of the individuals involved in the risk assessment process.
    - Risk management does not eliminate risk, but rather aid in the effective deployment of scarce resources and time.
    - Risk assessment is not a guarantee against the realisation of adverse events, but provides significant warning of possible problems and a focused approach to safeguard the enterprise's reputation and business continuity.
    - Although risk assessment will try to identify all significant risks, it is hampered by resource constraints, including the availability of information, staff, time and budgets.

The fact that a risk is beyond the control of the owner-manager, does not absolve him from the need to anticipate the risk, and reducing the impact of the risk occurrence to achieve organisational goals. Owner-managers should furthermore take cognisance of managerial risks that arise as a result of the owner-manager’s own actions when planning and executing business strategies. These risks may arise as a direct or indirect result of management actions (Berkeley, Humphreys & Thomas, 1991:5).

South African SME owner-managers should be educated in risk management principles, risk handling techniques available and risk control programmes that can be used, but care should be taken in the application of risk management principles, as although risk principles are common to all types of enterprises, the application thereof differs substantially between small and larger enterprises. However, many SMEs practise intuitive risk management when they assess the risk involved in decisions (Ntlhane, 1995:106-113; and Dupré, 2009:17).

4.8 DRIVERS OF RISK MANAGEMENT IN SMALL BUSINESS

Risk drivers is defined by Berkeley *et al*. (1991:6), as “… observable phenomena that are likely to drive up the possibility of some risk consequences which depend, in part at least, on the occurrences of this phenomenon”. A number of research studies have been conducted on identifying risk drivers to facilitate an understanding of the possibility of occurrences of risks and their possible impact. Risk drivers have been identified in various areas, e.g. drivers linked to the size and complexity of operations, depth of organisational knowledge about the business environment it functions in, the technology required in business activities, clientele characteristics, etc. One of the major influences on risks is managerial actions as they can increase or decrease the probability of negative risks occurring, taking cognisance of the interdependency of risk drivers (Berkeley *et al*., 1991:6,11,15).

According to Watt (2007:35-36), risk drivers may include:

- **Legislation and insurance:** This externally driven risk driver often dominates decisions for small organisations. Legislative issues may include:
  - Occupational health, safety and environmental legislation.

    - Contractual obligations.
    - Organisational specific requirements, e.g. hygiene legislation for food processing organisations.
- **Internal drivers or business process drivers** include:
    - Enhanced competitive advantage.
    - Improved product and service quality.
    - Reduced overspending on budgets.
    - Improved relationships with all stakeholders (employees, clients, suppliers, etc.).
- **Business practices:** By applying risk management principles, owner-managers can achieve:
    - Improved client confidence.
    - Reduced staff turnover, specifically concerning key personnel due to improved staff confidence.
    - Safeguarding of organisational reputation and brand development.

For risk drivers to be useful in practice, the following two requirements must be met:

- It must be reliably quantifiable inferring the existence of orderable levels, e.g. high, medium, low regarding the risk factor. The risk factor should describe the possible action that is to be observed or inferred from the observation. Furthermore, it must be determined what levels increase or decrease the probability of the risk consequences occurring.
- It must be observable in the context of business activities before the occurrence of the risk.

In practice, difficulty may however be experienced in accurately identifying appropriate risk drivers for anticipated risks that may materialise for a specific scenario. To accommodate the abovementioned difficulty, management should direct its focus to each scenario’s high level risk drivers before any risk is realised by incorporating a generic risk model, populated by organisational specific detail such as organisational policies and operating specifics, thus gaining a significant competitive advantage (Berkeley *et al*., 1991:6-8).

4.9 COMPONENTS OF RISK IN SMEs

Determining the components of total risk in SMEs is complex due to SMEs' great heterogenity as well as difficulty in separating property from management (St-Pierre & Bahri, 2006:550). Entrepreneurs have implied (Julien & Marchesnay, 1996[105] cited by St-Pierre & Bahri, 2006:550), inconsistent (LeCornu *et al*., 1996:1-14), and in certain instances unique (Naffziger *et al*., 1994:29-42), objectives that exert both direct and indirect influences on management practices, rendering comparisons between SMEs difficult. Information derived by way of financial data analysis cannot yield all the dimensions of enterprise performance, as emphasised by Eccles (1999[106]) cited by St-Pierre and Bahri (2006:550-557). Strategic information such as quality, client satisfaction and innovation, reflects the enterprise's competitiveness and performance, but is not forthcoming in the income earned. Cumby and Conrod (2001:261-272), emphasise that long-term sustainable financial performance is attributable to non-financial factors like client loyalty, employee satisfaction and internal processes. This view is affirmed by Ittner and Larcker (1998:1-35), who state that the investment in intangible assets, e.g. client satisfaction, is not accommodated in the accounting data. The same argument applies to the risk of an enterprise that is difficult to understand if attention is directed solely at the financial statements. Through the incorporation of non-financial data, the problems associated with the manipulation of financial statements are reduced. By following a systematic approach and by taking into account both financial and non-financial information related to the organisation, an enhanced understanding of SME risks can be achieved (St-Pierre & Bahri, 2006:550-557).

[105] Refer to footnote 6.
[106] Eccles, R.G. 1999. Le manifeste de l'évaluation des performances, in Les systèmes de mesure de la performance. *Harvard Business Review*, Editions de l'Organisation

Wynant and Hatch (1991[107]) cited by St-Pierre and Bahri (2006:550), in a banking industry study expressed the opinion that SMEs' total risk, measured as the total risk of the borrower's credit by the banker, consists of business risk and finance risks. This dispensation is graphically depicted in Figure 4.2.

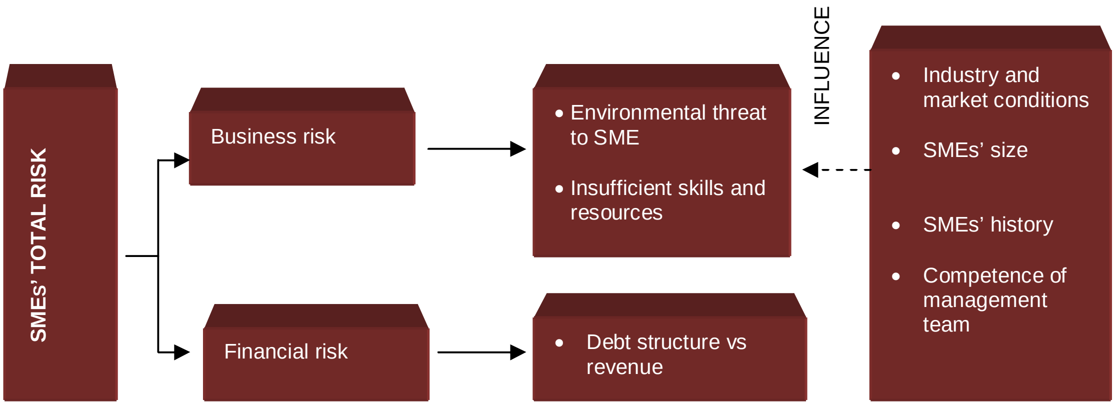

Figure 4.2: Components of SMEs' total risk as per Wynant and Hatch (**Source**: Adapted from St-Pierre & Bahri, 2006:550).

Twarabimenye (1995[108]) cited by St-Pierre and Bahri (2006:550), in evaluating loan specific risk by bankers, differentiates between the criteria of Wynant and Hatch (1991[109]), by stipulating managerial risk, macro-economic risk, and financial risk as the components of SMEs' total risk. This dispensation is graphically depicted in Figure 4.3.

[107] Wynant, L. & Hatch, J. 1991. *Banks and Small Business Borrowers*. The Western Business School. London: The University of Western Ontario.
[108] Twarabimenye, P. 1995. Modèle d'aide à l'évaluation du risqué de prêt aux enterprises. Thèse de doctorat en administration, Université du Québec à Montréal.
[109] Refer to footnote 107.

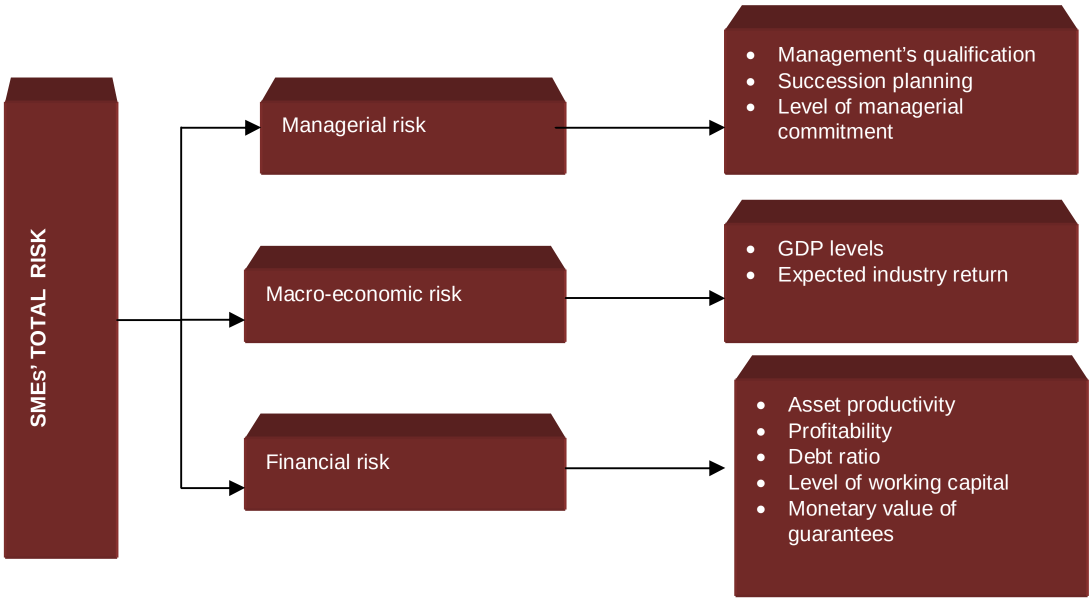

Figure 4.3: Components of SMEs' total risk as per Twarabimenye (**Source:** Adapted from St-Pierre & Bahri, 2006:550).

Carlton (1999:Online) and St-Pierre and Bahri (2006:550-551), in determining total SME risk, consolidate the different risk components into the following categories:

- Strategic risks,
- financial risks,
- operational risks,
- business risks, and
- technical risks.

The technical dispensation is graphically depicted in Figure 4.4

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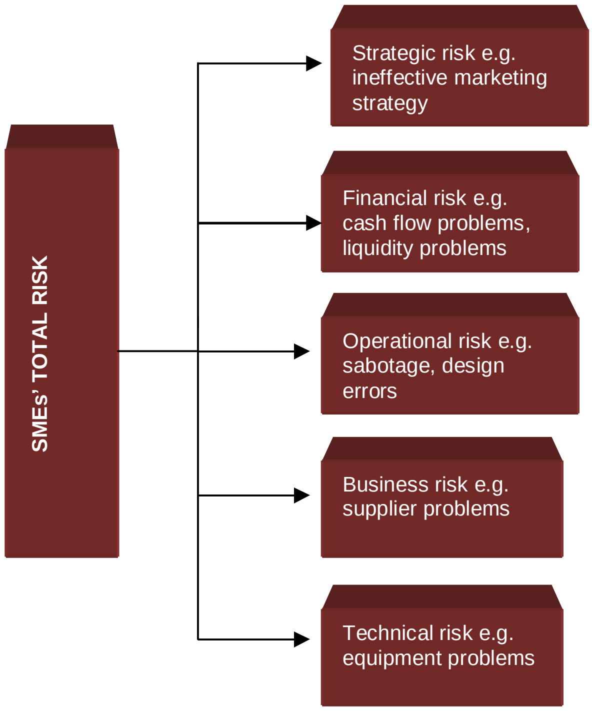

Figure 4.4: Components of SMEs' total risk as per Carlton (**Source:** Adapted from St-Pierre & Bahri, 2006:551).

Cotner and Fletcher (2000:27-33), identified five factors, with each factor consisting of a number of elements of risk, namely (St-Pierre & Bahri, 2006:551):

- The revenue risk factor consisting of the level and growth rate of sales.
- The operational risk factor linked to the level of fixed exploitation costs.
- The financial risk factor linked to interest cover, debt composition and capacity for indebtness.
- The management and control risk factor linked to investors' confidence pertaining to the management team, organisational experience and type of entity (family enterprise, minority shareholders, etc.).
- The strategic risk factor impacted by the entity's position with its suppliers, its clients, its current competitors, the risk of new products and substitutes.

The above dispensation is graphically depicted in Figure 4.5.

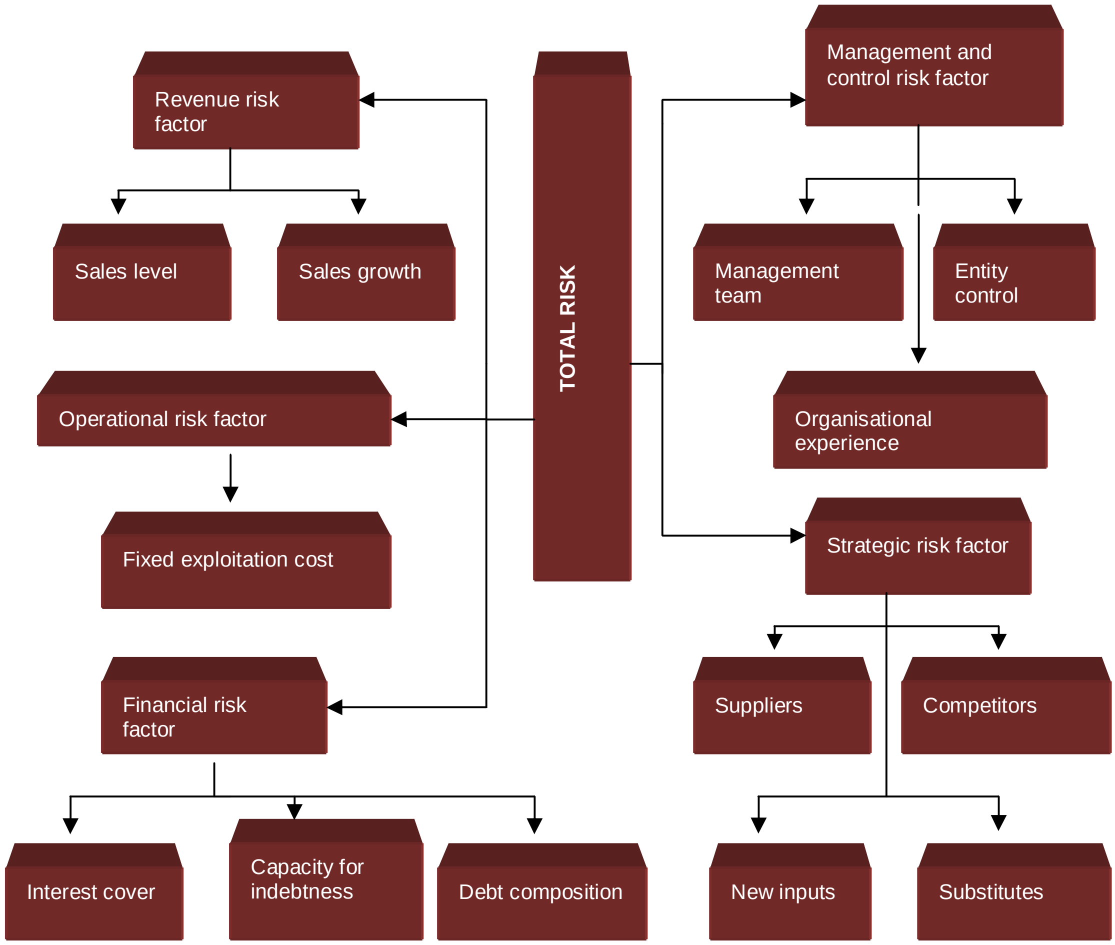

Figure 4.5: Cotner and Fletcher's total risk composition (**Source:** Adapted from St-Pierre & Bahri, 2006:551).

The various risk models as discussed in Wynant and Hatch (1991[110]), Twarabimenye (1995[111]), and Carlton (1999:Online), reflect the multidimensional character of SMEs and the various components of total risk in these organisations. St-Pierre and Bahri (2006:551), propose a synthesis of the total risk elements by categorising SMEs' total risk as consisting of the following primary components:

- Financial risk, i.e. risk activities related mainly to the enterprise's capital structure, its financial partners and financial contracts, and organisational capacity for reinvestment.
- Entrepreneurial risk, i.e. risk activities related mainly to the personality of the entrepreneur, the entrepreneur's risk aversion

[110] Refer to footnote 107.
[111] Refer to footnote 108.

preferences, and the entrepreneur's personal objectives for the enterprise's development.

The total risk components of SMEs as proposed by St-Pierre and Bahri (2006:551) are tabulated for ease of reference in Table 4.4.

Table 4.4: The total risk components of SMEs (**Source:** Adapted from St-Pierre & Bahri, 2006:551).

PRIMARY RISK TYPE	**SECONDARY RISK TYPE**	**RISK DESCRIPTION**
Business risk	Management risk	Lack of management tools, e.g. cash flow statements, absence of a board of directors or management committees, absence of a designated head for each of the organisation's functions, lack of human resource function
	Commercial risk	Client retention, demand fluctuations, distribution difficulties, competitive position of the organisation, actual and potential markets
	Technological risk	Lack of continuous improvement initiatives, absence of research and development activities, problems with equipment, inadequate production structure
Financial risk		Profitability level, debt load, interest coverage, capacity for indebtness, capacity for reinvestment by owners
Entrepreneurial risk		Owner-manager's age, experience, education and training

Through globalisation, greater pressure is applied on organisations to timely apply new management and production technologies, continuous improvement and the embedding of good business practices. A swift risk evaluation process using a prospective model that incorporates financial and non-financial factors, can contribute to enterprise success by e.g. securing external financial resources needed for development without undue delay (St-Pierre & Bahri, 2006:556-557).

4.10 THE MANAGEMENT OF SME RISK

In a study conducted by Ntlhane (1995:98-101), it was confirmed that owner-managers of SMEs are largely ignorant regarding the type of business to operate, the type of product to produce, the location of their operations, etc. These factors, i.e. sources of risk, along with others, hold a myriad of risks to the enterprise, and provide an indication of owner-managers' ignorance regarding risks that face their enterprises. Few SME owner-managers are risk-aware and they focus risk actions on 'loss control' programmes pertaining to fire, safety, security, health and quality assurance. These 'loss control' programmes are controlled by either the entrepreneur or other management along with their other duties, therefore increasing the chance of mismanagement, as adequate time is not spent on the risk function. As no structured risk identification is undertaken by SMEs, SMEs assume unaware or unplanned risk exposure to their limited financial resources (Ntlhane, 1995:98-101).

Risk has a monetary impact, whether destruction of an asset through theft or termination of supply contracts due to defective products, or others, and these losses impede on the financial results of an enterprise. To limit the effect of risks on the enterprise, risks need to be managed/controlled once they have been identified. In SMEs, the control of risk exposure is construed reactively, holding disastrous consequences for the enterprise as losses are taken on while the enterprise is ill-prepared for financing the loss. In most SMEs, risks are left unmanaged till they realise, only then initiating action to address them (Ntlhane, 1995:102).

By using interviews Ntlhane (1995:104), established that SME owners and managers are not versed in the availability and use of risk reduction techniques (i.e. risk elimination/avoidance, reduction, transfer or acceptance) to reduce the adverse effects of risks on the enterprise. The study identified that entrepreneurial actions are centred on avoiding risk, rather than devising risk control methods. This impedes on the economic progress of a country as every business may be defined by its ability to take on greater risks. Apart from risk avoidance, the study identified risk transfer as the alternative risk technique used by SMEs, whereby insurance brokers are used to take up all risk actions, i.e. risk identification, risk assessment, risk control and risk financing. Risk retention techniques in terms of which risks are financed by internal reserves such as current income, are little known and rarely applied in SMEs (Ntlhane, 1995:104).

4.11 RATIONALE FOR DEVELOPING A STRATEGIC RISK MANAGEMENT STRATEGY

Strategic risk management enables SME owner-managers to objectively evaluate their actions. One of the difficulties encountered in risk management is that most risk assessments are linked to a specific discipline, which is not necessarily known by owner-managers. Furthermore, owner-managers may be able to identify the obvious risk, but their depth of risk knowledge may impede on their ability to identify indirect risks or take cognisance of the interconnectedness of risks (Watt, 2007:35-36).

Hisrich and Peters (2002:239[112]) cited by Watson (2004:84-85), emphasise that owner-managers should develop a risk strategy to avoid, reduce or respond to potential risks. It is therefore essential that owner-managers are equipped with the necessary skills to compare risks and identify appropriate risk strategies in adequately addressing these risks. Depending on the specific circumstances, owner-managers should engage in actions limiting the probability of risk occurrence, or if need be, plan strategies that maximise the probability of recovery (Watt, 2007:35-36).

By embedding a risk management strategy in processes of an SME, according to Watt (2007:35-36), significant advantages can be achieved, namely:

[112] Refer to footnote 68.

- Ensuring that the SME's activities are aligned to its mission and objectives, and not diverted by external influences.
- Ensuring that organisational activities comply with industry best practices, and that regulative compliance is achieved.
- Providing legal protection if difficulties occur.
- Resulting in cost savings by reducing insurance expenses.

Strategic risk management facilitates an effective risk approach by prioritising risks, thereby reducing surprises, and directing the focus on important risks. This has the effect of reducing the possible overmanagement of insignificant risks. In the risk management process, management should be aware that risk actions must be tailored to the specific needs of the enterprise, taking into account its prevailing resources, needs and opportunities. Although risk assessment should be a comprehensive function, caution should be exercised against formulating an excessive risk strategy (Watt, 2007:40). Given the size and managerial structure of SMEs, the process of establishing and using a strategic risk management function is relatively simple, given the close relationship between owners, managers and operators of the enterprise. Compared to larger enterprises, it is easier for SME executive management to embed a risk management policy and be routinely and actively involved in the application of the strategic risk management policy, especially if these activities are seen as performance-enhancing processes (Watt, 2007:34-35).

According to Beckett (2005:330), SME owner-managers need to be aware that through joint discussion of risk with SME employees, which include an effective feedback process and a risk valuation process, organisational trust is established. The way of conducting risk management, i.e. the shape of the risk management process, will depend on all the participants' risk propensity as well as the situational control that is exercised at the time. As a result, risk-tolerant participants may prefer an informal risk review process, while risk-adverse participants will favour comprehensive contractual arrangements. Through experience (Beckett, 2005:330-332), it has been gleaned that:

- The creation of a positive organisational risk culture whereby all participants concerns are understood and experiences are shared, is facilitated through a constantly evolving process of risk identification and the planning of containment strategies.
- Through joint proactive identification of risks, and by employing holistic risk management practices, management can establish a positive environment to deal with all issues.

Regardless of the risk propensity of the participants, a structured approach to risk management will assist in providing a goal-orientated and consistent risk management process.

CHAPTER 5
SURVEY DESIGN AND METHODOLOGY

SYNOPSIS

In this thesis applied research is taking place in the social world, which encompasses both an empirical and a theoretic research approach. Data validity is ensured through applying methodological triangulation incorporating both a positivistic and phenomenological research paradigm. This aids in facilitating a holistic, complete and contextual portrayal of the research, i.e. risk management in SMEs in the Western Cape. In ensuring that no adverse consequences follow from the research conducted, ethical considerations upheld include informing research participants of the proposed benefit of the study, maintaining the confidentiality and anonymity of respondents, obtaining informed consent and providing respondents the option to receive follow-up information pertaining to the research results.

The primary research method employed is an experimental case study, whereby risk literature is reviewed and interviews are conducted in an integrative interpretation of SME risk practices. The measuring criteria of validity, reliability and generalisability are used in providing quality checks.

A purpositive sampling method is employed whereby data is drawn from a sample of SME owner-managers in the Western Cape. Questionnaires are used as the data collection method taking cognisance of the pertinent issues of question content, question wording, response structure and question sequence. With respect to the primary purpose of the survey i.e. obtaining respondents' views of risk management processes and practices, nominal and ordinal measurement scales were selected as instrument of choice. Data analysis was executed by way of descriptive and inferential statistics.

The content of Chapter 5, along with the relative positioning of the topics, is graphically depicted in Figure 5.

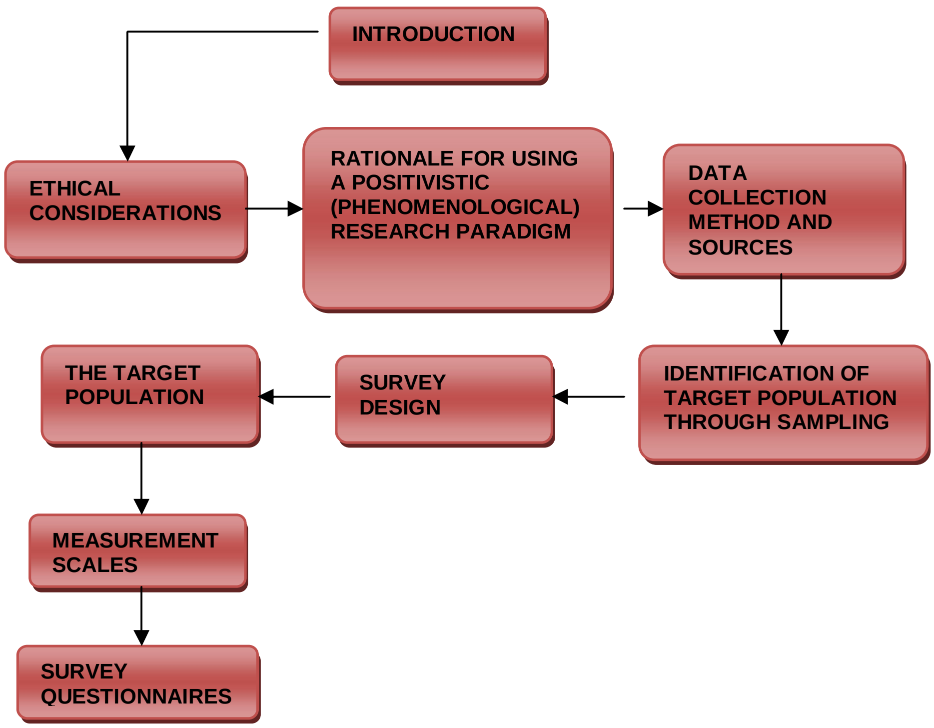

Figure 5: Detailed layout of Chapter 5 – Survey design and methodology.

CHAPTER 5
SURVEY DESIGN AND METHODOLOGY

5.1 INTRODUCTION

The relative positioning of Chapter 5 within the ambit of the thesis is depicted in Figure 5.1.

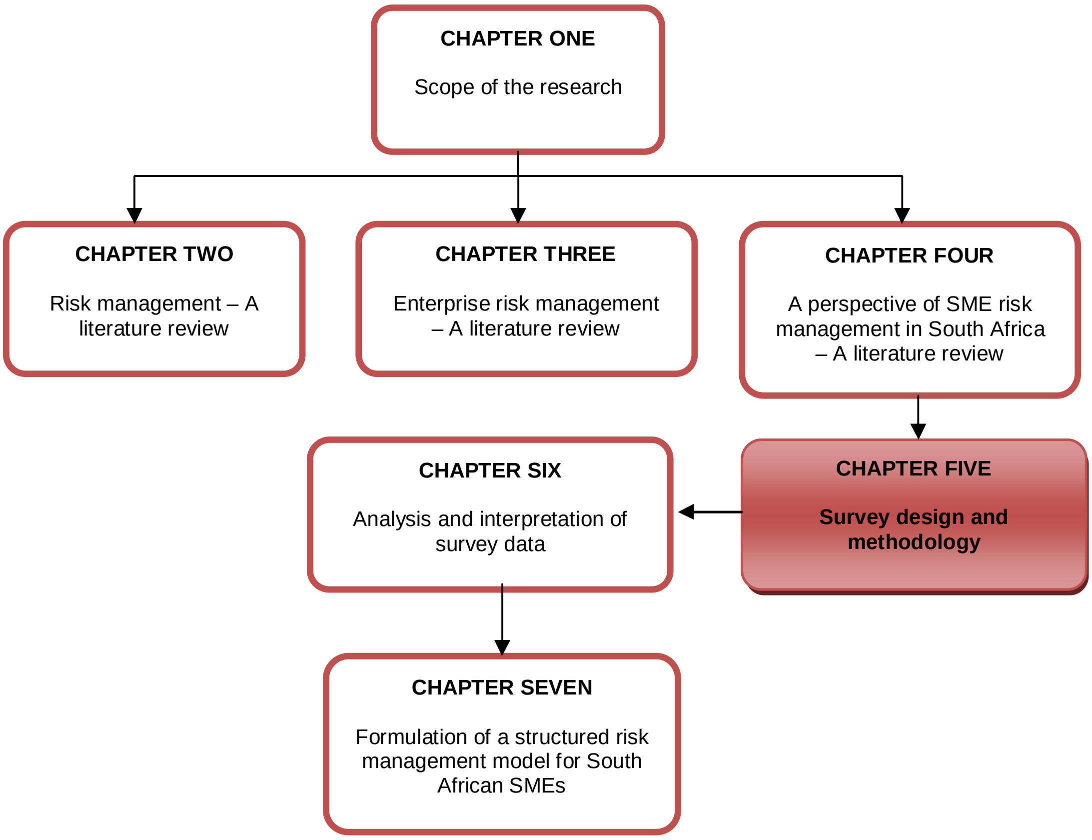

Figure 5.1: Chapter 5 - Survey design and methodology positioning.

An experimental case study will be conducted within the SME retail sector in the Western Cape, South Africa, to glean data pertaining to risk management practices engaged in by SME owner-managers. The selected data collection method are questionnaires (Cooper & Schindler, 2006:245), which is executed within the ambit of a survey. Holistically, the objectives of this chapter and survey are to determine:

- ➢ The depth of current risk management practices embedded in SMEs.
- ➢ The effect of current risk management practices on SME success.

- The perceived and tangible obstacles to a structured risk management process as experienced by SME owner-managers.
- SME owner-manager motivating factors for implementing a structured risk management process.

Chapter 1 defines the research problem as: 'No structured approach to risk management exists for South African SMEs in the retail trade, adversely impacting on the risk efficiency of the industry'. The data gleaned from analysing and interpreting the survey data aims to solve the above defined research problem.

5.2 ETHICAL CONSIDERATIONS

The objective of research ethics is to ensure that no adverse consequences or harm follow from the research activities (Cooper & Emory, 1995:97). According to Saunders, Lewis and Thornhill (2000:131), research ethics comprise four subsections namely:

- Ethical considerations pertaining to the research process in general.
- Ethical considerations pertaining to the design phase and the initial access phase.
- Ethical considerations in the data collection phase.
- Ethical considerations pertaining to the data analysis and reporting phases.

Generic ethical considerations: Cognisance should be taken of the following generic ethical issues (Saunders *et al*., 2000:132; and Collis & Hussey, 2003:38-39):

- The privacy of actual and potential participants.
- Participation is on voluntary basis and participants may at any stage exercise their right to withdraw partially or completely from the research activity.
- Consent and potential deception of participants. Potential participants should be informed of the purpose of the research and agreement should be obtained on participants' research involvement.

- Upholding the confidentiality of information provided by participants.
- Participants' reaction on the selected data collection method.
- The effect of the use, analysis and reporting of data on the participants.
- The objectivity and behaviour displayed by the researcher.

Ethics pertaining to research design and initial access: When attempting to gain initial access to potential participants, the possibility of ethical problems need to be considered. Cognisance should be taken of individuals' right to refuse participation. Privacy also includes the nature and anticipated timing of approaching participants as well as the distribution and use of secondary research data (Saunders *et al*., 2000:133; and Remenyi *et al*., 2002:229-230). The scope of participants' consent can be measured along a continuum as depicted in Figure 5.2.

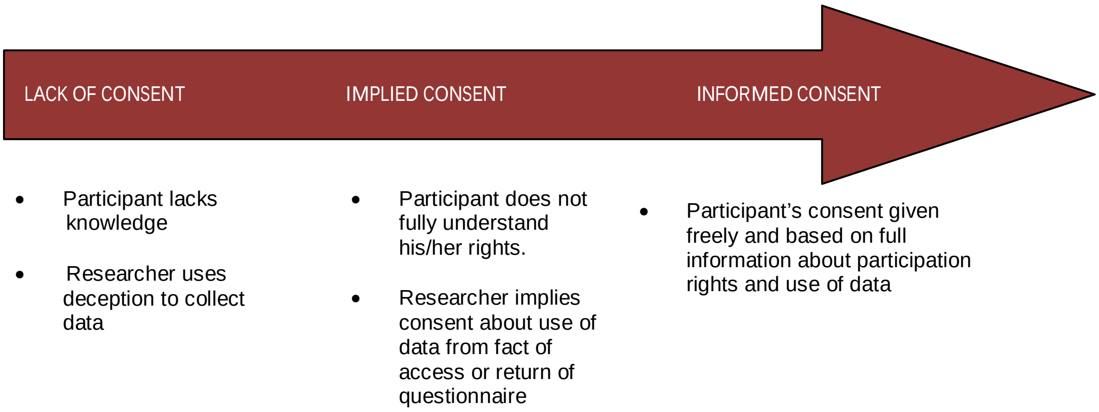

Figure 5.2: Continuum of participants' consent (**Source**: Saunders *et al*., 2000:134).

The extent of informed consent required as well as the nature of establishing informed consent will be dependent on the nature of the research conducted (Saunders *et al*., 2000:134).

Ethical considerations during the data collection phase: Ethical considerations during this stage consist of general ethical issues as well as ethical considerations related to the particular data collection method. General ethical issues to be considered according to Saunders *et al*. (2000:135-136) include the following:

- Participants' right to partake in the research, including their right to withdraw from the process at any stage. The researcher should furthermore not alter the communicated scope of the research without informing the participant and re-negotiating access.
- Within the context of objectivity, the researcher should employ an accurate and comprehensive data collection method reducing subjective data selectivity, which contribute to the validity and reliability of the research.
- The level of confidentiality and anonymity offered to the research participant should be maintained with respect to the type of research to be conducted, i.e. qualitative or quantitative.

Ethical considerations pertaining to interviews as the data collection method purposes that care should be taken during face-to-face interviews not to force a participant's response (Saunders *et al*., 2000:138). The participants should be informed of their right to decline answering any question or part thereof and guard should be taken against asking demeaning questions. Furthermore, meetings with the participants should be scheduled according to the participants' preference, thus at their preferred time.

Dale *et al*. (1988:57[113]) cited by Saunders *et al*. (2000:139), proclaim that problems related to survey research are less difficult if compared to difficulties experienced with qualitative research, as the nature of a structured survey does not lend itself to the exploration of responses. According to Zikmund (1997[114]) cited by Saunders *et al*. (2000:139), ethical considerations pertaining to survey research encompass the more general issues of privacy, deception, openness, confidentiality and objectivity.

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[113] Dale, A., Arber, S. & Procter, M. 1988. *Doing Secondary Research*. London: Allen & Unwin.
[114] Zikmund, W.G. 1997. *Business Research Methods 5th Edition.* Fort Worth: Dryden Press.

Ethics pertaining to the data analysis and reporting phase: It is of vital importance to uphold the validity of data collected. This implies the inclusion of all data selected and/or its accurate statistical representation. Care should be taken to provide a honest, balanced report of findings, as opposed to reporting only such data which support the opinion of the researcher. During the reporting stage, the confidentiality and anonymity of participants should be upheld as agreed before the commencement of the research. Ethical considerations further encompass third-parties' use of the researcher's conclusions as well as any implicit or explicit course of action suggested (Saunders *et al.,* 2000:139-140; Remenyi *et al*., 2002:231; and Collis & Hussey, 2003:39).

By incorporating the guidelines provided by the abovementioned authors as well as Cooper and Emory (1995:98) and Cooper and Schindler (2006:118-119), in the research activity the following ethical considerations are being upheld:

- **Inform participants of the benefit of the research:** Owner-managers of retail SMEs were informed of the purpose and expected benefits of the research study.
- **Maintaining confidentiality and anonymity of participants:** SME owner-managers were informed that no survey data will be made available that may identify the specific business entity, and completed questionnaires will not be made public to any person or institution.
- **Informed consent:** SME owner-managers were informed of the nature of the questionnaire. They were made aware that their participation in the research is of a voluntary nature and that they are under no obligation to answer any questions they are uncomfortable with.
- **Debriefing:** SME owner-managers were offered the option to receive follow-up information about the research results. If this choice was selected by the participants, contact details were provided by the research participant.

5.3 RATIONALE FOR USING A POSITIVISTIC (PHENOMENOLOGICAL) RESEARCH PARADIGM

The methodology applied in this research encompasses both a theoretical and empirical research approach. Theoretical approach is concerned with the study of writings of others without direct interaction in observation or data collection, as opposed to empirical research that is based on observation done through experiments or passive observation. It should be noted that the use of one approach is not exclusive to the use of the other, as empirical research implies an understanding of theoretical subject matter (Remenyi *et al*., 2002:31).

Methodological triangulation will be applied in this research (Collis & Hussey, 2003:78). Triangulation contributes towards the validity of data and facilitates a more holistic, complete and contextual depiction of the research matter (Ghauri, Grønhaug & Kristianslund, 1995:94; and Cooper & Schindler, 2006:219). Both a positivistic (quantitative) and phenomenological (qualitative) research paradigm will apply supporting the view of Berstein (1996:202[115]), cited by Remenyi *et al*. (2002:96), that where quantitative research is insufficient, qualitative research should be deployed: "Where information is lacking, we have to fall back on inductive reasoning and try to guess the odds".

An experimental case study is used as the primary research method whereby existing risk literature is reviewed and interviews are conducted with SME owner-managers to gain insight and study the multidimensional nature of SME risk management practices, thereby deriving at an integrative interpretation of the real-life scenarios studied (Ghauri *et al*., 1995:88-89; and Collis & Hussey, 2003:68). The positivistic measuring criteria of validity, reliability and practicality will be used for both positivistic and non-positivistic research as these measurement indicators provide valid quality checks (Remenyi *et al*., 2002:114):

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[115] Berstein, P. 1996. *Against the Gods*. New York: John Wiley.

- **Validity:** Validity concerns both internal and external validity (Cooper & Emory, 1995:149-153,360):
  - **External validity:** Pertaining to research findings, external validity refers to the ability to generalise across persons, settings and time. Interactive threats to external validity consists of :
    - **The Reactivity of Testing on X:** The subjects' behaviour is altered by the use of a pre-test, whereby they are familiarised with the stimulus thus influencing their behaviour. This threat was eliminated in this study by not conducting any pre-tests on the subjects.
    - **Interaction of Selection and X:** The sample selection method may not be homogenous to the population, which results in the inability to generalise the results to the population. The sample frame in this research study was selected using purposive sampling.
  - **Internal validity:** Validity pertaining to the research instrument refers to the extent to which differences found with the measuring tool are an accurate reflection of the differences. Internal validity can be classified according to:
    - **Content validity:** A measuring instrument should adequately cover the research topic in order to be regarded as having 'content validity'.
    - **Criterion-related validity:** This term encompasses predictive and concurrent validity, that respectively entails the success of measures used for predicting future and current outcomes or estimates.
    - **Construct validity:** Construct validity pertains to the measurement of abstract traits, where empirical validation seems improbable.

- **Reliability:** The term reliability refers to consistency. In terms of a measurement instrument, the degree of reliability will be determined by the consistency of the results with specific reference to the stability, equivalence and internal consistency of the instrument (Cooper & Emory, 1995:153). In assessing the reliability of a measurement instrument, the following questions may be posed (Easterby-Smith *et al.*, 1991:41[116] cited by Saunders *et al.*, 2000:100):

- o Will the measurement indicator produce the same result on different occasions?
- o Will similar observations be reached if the researcher and the occasion differ?

- ➢ **Practicality:** The measurement process selected should, in addition to complying with the requirements of validity and reliability, comply with the operational requirement of practicality, where practicality encompasses economy, convenience and interpretability.

However, in line with the nature of non-positivistic research, focus will not solely be directed at validity, reliability and practicality, but also at achieving consistency and integrity of the research design (Remenyi *et al.*, 2002:114).

5.4 DATA COLLECTION METHOD AND SOURCES

Within the ambit of this research study, data will be collected via secondary and primary sources (Ghauri *et al.*, 1995:54-57). Secondary data sources referred to in this research consist of:

- ➢ Research studies and reports issued by institutions and researchers.
- ➢ Academic theses and reports.
- ➢ Published textbooks and journals, and the Internet.

By using secondary data sources in the research, cost-efficiency is enhanced. It furthermore provides a platform for the formulation and understanding of the research question, and aids in the broadening of the base to derive at scientific conclusions. Furthermore, the use of secondary

[116] Easterby-Smith, M., Thorpe, R. & Lowe, A. 1991. *Management Research*: *An Introduction*. London: Sage.

data aids in the improvement of reliability of information and conclusions. However, using secondary data in isolation is not desirable, as this has been collected to meet the objectives of another study (Ghauri *et al*., 1995:55-56).

Primary data will be collected via questionnaires as part and parcel of a descriptive survey (Ghauri *et al*., 1995:57-58). Descriptive surveys are suitable to identify and describe the variability in different phenomena (Saunders *et al*., 2000:279). The rationale for using a survey as a data collection method relates to its versatility in that it accommodates all the gathering of types of information through questioning participants (Cooper & Schindler, 2006:245).

Questionnaires are suitable for both positivistic and phenomenological methodologies. Under a positivistic approach, closed questions are used, while a phenomenological approach suggests the use of open-ended questions (Collis & Hussey, 2003:173-174). Questionnaires can be categorised according to distribution method, each with its own strengths and weaknesses (Saunders *et al*., 2000:280; Remenyi *et al*., 2002:156; and Collis & Hussey, 2003:175-176):

- **Mailed questionnaires:** This self-administered questionnaire allows the respondents to complete the questionnaire in their own time, without possible interviewer influence. A major drawback of the use of mailed questionnaires is the low response rate.
- **Computer-administered questionnaires:** These self-administered questionnaires are distributed electronically by e-mail or the Internet, affording the respondent the opportunity to complete it in his/her own time, without any interview bias. A disadvantage of this collection method is the restriction of the sample to users on the network, and complexities pertaining to programming and design.
- **Telephone interview questionnaires:** This interview-administered questionnaire is a relative low-cost technique with reduced interview bias. However, due to the inaccessibility of unlisted numbers, response bias errors may occur.

- **Personal interview questionnaires:** These interview-administered questionnaires require face-to-face conversation where open- and/or closed-ended questions may be asked, with approaches ranging from informal to highly structured. Disadvantages pertaining to personal interview questionnaires relate mainly to cost. Advantages to this collection method include the opportunity to probe complex issues, a relaxed interview environment, possibility to record additional information and high response rate.

In selecting the type of research questionnaire to be used, cognisance should be taken of resource availability namely (Saunders *et al*., 2000:279-282):

- The time available for collecting data.
- Financial implications pertaining to data collection and capturing.
- Availability of assistants, i.e. interviewers and field workers.
- Ease with which data entry can be automated.

By taking the abovementioned considerations into account as well as the advantages and disadvantages of each type of questionnaire, personal interview questionnaires were selected as the data collection method for this research.

5.5 IDENTIFICATION OF TARGET POPULATION THROUGH SAMPLING

Sampling, as opposed to a census strategy, was selected as the method whereby elements were selected for analysis. Sampling is defined by Cooper and Schindler (2006:72), as: "… a sample is a part of the target population, carefully selected to represent that population". The rationale for selecting sampling as opposed to a census strategy according to Saunders *et al*. (2000:150-151) and Cooper and Schindler (2006:403), are:

- The lower cost of sampling in contrast to the high cost of a census.

- Sampling provides greater accuracy of results as argued by Deming (1960[117]), cited by Cooper and Schindler (2006:403): "Sampling possesses the possibility of better interviewing (testing), more thorough investigation of missing, wrong, or suspicious information, better supervision, and better processing than is possible with complete coverage".
- Improved speed of data collection in contrast to the time-consuming nature of a census.
- The availability of population elements.

By reviewing the different sampling methods, purposive sampling (Saunders *et al*., 2000:152), was selected as the method of choice for this research study. Table 5.1 depicts the impact various factors have on a purposive sampling technique.

Table 5.1: Impact of various factors on purposive sampling (**Source**: Adapted Saunders *et al.*, 2000:171).

SAMPLE TYPE	LIKELIHOOD OF SAMPLE BEING REPRESENTATIVE	TYPES OF RESEARCH IN WHICH USEFUL	RELATIVE COST	CONTROL OVER SAMPLE CONTENTS
Purposive	Low although dependent on researcher's choices: ➢ Extreme cases ➢ Heterogeneous ➢ Homogeneous ➢ Critical case ➢ Typical case	Where working with very small samples Focus: unusual or special Focus: key themes Focus: in-depth Focus: importance of case Focus: illustrative	Reasonable	Reasonable

In selecting purposive or judgemental sampling, the researcher's focus is directed to the most appropriate cases in answering the research questions and research objectives. Although purposive sampling is not statistically representative of the total population, it is selected based according to Saunders *et al.* (2000:174), on the following strategies:

- Extreme case sampling focuses on unusual or special cases. The rationale in selecting extreme cases is based on the assumption that

[117] Deming, W.E. 1960. *Sample Design in Business Research.* New York: Wiley.

extreme case information is relevant in understanding more typical cases.

- Heterogeneous or maximum variation sampling provides data to describe and explain key themes that are observed.
- Homogeneous sampling's focus is directed at specific subgroups consisting of similar sample members.
- Critical case sampling directs the research focus to critical cases due to their importance.
- Typical case sampling provides an illustrative profile by using a representative case.

In this research study, a homogeneous sampling strategy was followed focusing on SME owner-managers in the Western Cape retail sector, as the strategy provided ample opportunity to study the cases in-depth.

5.6 SURVEY DESIGN

Survey design can be classified in terms of analytical surveys and descriptive surveys. Analytical surveys are concerned with the identification of the independent, dependent and extraneous variables, whereas descriptive surveys focus on identifying the phenomena that the researchers wish to describe the variance of (Ghauri *et al*., 1995:59-60).

A descriptive survey will be conducted, as this research is concerned with identifying the phenomena of 'risk management' of which the variance needs to be described, pertaining to a specific population, i.e. SME owner-managers, at a specific point in time. The descriptive survey's focus is more directed at obtaining a representative sample of the determined population, than on the analytical design, as the area of importance centres around the accuracy of the findings as well as the generalisation thereof (Ghauri *et al*., 1995:59-60).

Although the survey design process, encompassing questionnaire creation and application vary according to the complexity of the subject, Riley, Wood, Clark, Wilkie and Szivas (2000:97), suggest a nine-stage process to follow:

- **Stage one:** Identification of topic and setting of objectives.
- **Stage two:** Pilot a questionnaire to determine individuals/groups:
  - Current level of knowledge.
  - Aspects viewed as important.
- **Stage three:** List the areas of information needed and refine the objectives.
- **Stage four:** Review participants' response to the pilot questionnaire.
- **Stage five:** Finalise the questionnaire objectives.
- **Stage six:** Write the questionnaire.
- **Stage seven:** Re-pilot the questionnaire.
- **Stage eight:** Finalise the questionnaire based on stage seven's response.
- **Stage nine:** Codification of questionnaire.

In developing the survey instrument, attention should be directed at question content, question wording, response structure and question sequence (Cooper & Emory, 1995:303-317; and Cooper & Schindler, 2006:365-374):

- **Question content:**
  - Questions posed should provide meaningful information in order to be justified on economic or research grounds.
  - Double-barred questions should be avoided.
  - Questions need to be constructed to extract all the information needed on a specific issue.
  - Filter questions may be incorporated in the questionnaire to quantify the respondent's knowledge.
  - Biased questions, either through omitting detail or including detail, influence the adequacy of the respondent's answers.
  - Respondents may be unwilling to answer certain questions based on the sensitivity of the question, the socio-economic status of the individual or other reasons.

- More information can be secured if a good rapport is established with the respondent. By providing assurance of confidentiality through interviewer action and question wording, respondents' motivation in answering truthfully is increased.
- Question sequences can lead respondents from 'safe' questions to more sensitive questions.

➢ **Question wording:**

- Shared vocabulary that is common to both interviewee and respondent should be used, by using simple wording and non-technical language.
- Questions should be clearly structured to avoid misunderstanding.
- The use of unwarranted assumptions should be avoided.
- Questions should be structured using unbiased wording, thereby not leading the respondent towards an intended or unintended preferred answer.
- Questions should be posed with the right degree of personalisation.
- Adequate alternatives should be presented. It is preferred to express each alternative explicitly to avoid bias.

➢ **Response structure:**

The use of open questions also referred to as unstructured questions, or closed questions also referred to as structured questions (Cooper & Emory, 1995:311-313; and Cooper & Schindler, 2006:364), depends on five situational factors, namely:

- The objectives of the interview.
- The level of the respondent's knowledge about the topic.
- The degree in which the respondent has thought the questions through.
- The ease with which the respondent can communicate as well as the respondent's motivation for participation.

- o The degree to which all the abovementioned factors are known to the interviewer.

Open response questions are advantageous in discovering opinions and degrees of knowledge when the topic of the questions falls outside the respondent's experience, or when the interviewer is unsure of the respondent's reference frame or depth of knowledge. In comparison, closed questions are perceived as less threatening by respondents and require less motivation to answer. Furthermore, closed questions reduce the variability of responses, are less demanding on interviewer skills, are less costly to administer and are easier to code (Cooper & Emory, 1995:311-313).

In this thesis, multiple-choice questions were used predominantly where the participants were asked close questions and selected an answer from a list of predetermined responses. In guarding against an exhausting list of possible options, respondents could select where applicable the category 'other' and provide answers according to their preference (Cooper & Emory, 1995:311-313; Collis & Hussey, 2003:181; and Cooper & Schindler, 2006:370).

- ➢ **Question sequence:**
  The concept of question sequence is important as it acts to awaken participants' interest in the study and to motivate them to participate. The questioning process should be designed to first introduce simple concepts and gradually move towards complex concepts and from general items to specific items. Any change in the frame of reference should be small and the participant should be aware of it (Cooper & Emory, 1995:315-317).

5.7 THE TARGET POPULATION

A research hypothesis proposes the relationship between variables in a population. The population is the research object and may consist of individuals, groups, organisations, products, events or conditions to which previously mentioned objects are exposed (Welman, Kruger & Mitchell, 2005:52-53). Welman *et al*. (2005:52) defines a population as, "… the population encompasses the total collection of all units of analysis about which the researcher wishes to make specific conclusions", where units of analysis refer to members or elements of the population, thus the subject on which the measurement is being taken (Cooper & Emory, 1995:201).

In this research study, the unit of analysis were owner-managers of SMEs, drawn from the target population of retail SME owner-managers in the Western Cape, South Africa.

5.8 MEASUREMENT SCALES

The survey was specifically constructed to elicit the respondents' views on risk management processes and the practice thereof. In selecting and constructing the measurement scale, the following survey specific factors were taken into consideration (Cooper & Schindler, 2006:332-333):

- The research objectives encompassing the following:
    - Determine if the issues highlighted in the literature review map to risk practices employed by SMEs.
    - Determine the level of risk knowledge of South African SME owner-managers.
    - Determine the current use of risk management models by SME owner-mangers and the adequacy of the current risk methodologies applied.
    - Provide acceptance of the null hypothesis.
    - Assist in the formulation of a structured risk management model, specifically aimed at reducing the risks associated with South African SMEs.
    - Assist in evaluating the implementation viability of the proposed formulated risk management model for South African SMEs, and to determine the potential benefits which can be gleaned from such an application.

- The response types consisting of rating, ranking and categorisation types.
- The data properties created by each measuring scale.
- The number of dimensions measured in this survey incorporating both the use of one-dimensional and multidimensional scales.
- The use of a balanced rating scale if applicable.
- The survey encompasses the use of unforced-choice rating scales and forced-choice rating scales, were the participant is awarded, in certain instances, with the option of 'other'.
- The survey includes a five-point rating scale due to the complexity of the area being assessed.

The measurement scales (Cooper & Schindler, 2006:312-314,337), used in the survey consists of:

- **Nominal measurement scale:** Respondents were asked to select responses in categories that are mutually exclusive and collectively exhaustive. Nominal scales were selected based on their value to uncover relationships. Simple category scales (dichotomous); multiple-choice, single-response scales; multiple-choice, multiple-response scales were used.
- **Ordinal measurement scales:** The same characteristics apply as in nominal scales plus an indication of order. The use of a numerical scale was included in the survey.

The questionnaire or measuring instrument is structured by placing background questions first, then activity and usage questions and lastly attitudinal questions (Remenyi *et al*., 2002:154-156).

In selecting the measuring tool the three main criteria of validity, reliability and practicality were taken into consideration. Validity can be classified according to internal and external validity, where external validity refers to the ability of data to be generalised across different settings, and internal validity refers to the ability of the research instrument to measure what it is purposed to measure. Further differentiation can be made according to content validity, criterion-related validity, and construct validity (Cooper & Schindler, 2006:318-321). Reliability purports to the degree that a measure supplies consistent results and can be categorised according to the perspectives of stability, equivalence and internal consistency (Cooper & Schindler, 2006:321). The operational requirements of a research project calls for the project to be practical, with practical defined as economy (comparison between ideal research project and project budget), convenience (referring to the ease with which the project can be administered), and interpretability (applicable when persons other than the survey designer must interpret the results) (Cooper & Schindler, 2006:323-324).

5.9 SURVEY QUESTIONNAIRES

Appendix A depicts the survey questionnaire that will be posed to SME owner-managers in the retail sector in the Western Cape.

CHAPTER 6
ANALYSIS AND INTERPRETATION OF SURVEY DATA

SYNOPSIS

Inferential and descriptive statistics were performed on a sample of 158 respondents conducted by way of a survey on Western Cape SMEs. The survey data returned that more than 85% of respondents had clear defined business objectives and strategies. Furthermore, the majority of respondents indicated that they had a clear understanding of the risks impeding on their organisation. Risk identification is centred on financial risks followed by operational and sales/marketing risks.

Although the majority of respondents have clearly defined business objectives and goals, only 17% of respondents indicated that they had a partial or complete risk management framework. It is of interest to note that respondents without clearly defined business strategies and objectives, also lacked a structured risk management approach with inadequate comprehension of the associated risks. Smaller organisations tend not to engage in a structured risk management approach citing the lack of intellectual capital, insufficient skills and costs as the primary obstacles faced, thereby adversely impacting on the organisation's risk efficiency.

An encouraging statistic emerging from the survey data is that more than 60% of respondents without a risk management framework indicated an interest in using such a framework. Profit maximisation, improved customer services, cost reduction and the safeguarding of assets were cited as the motivating factors for the implementation of a risk management framework. By engaging in a structured risk management approach and developing and embedding a structured risk management framework in the organisation, organisations could significantly improve their risk efficiency.

The content of Chapter 6, along with the relative positioning of the topics, is graphically depicted in Figure 6.

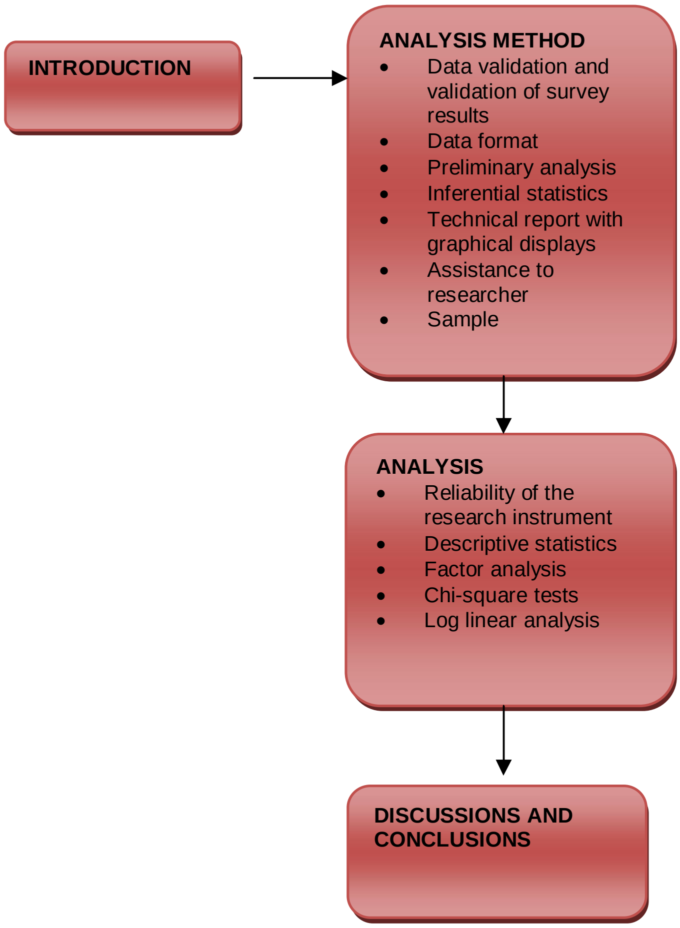


Figure 6: Detailed layout of Chapter 6 – Analysis and interpretation of survey data.

CHAPTER 6

ANALYSIS AND INTERPRETATION OF SURVEY DATA

6.1 INTRODUCTION

The analytical process followed thus far is graphically depicted in Figure 6.1, which places the chapters in context with the overall thesis objectives, and furthermore indicates the relative positioning of this chapter.

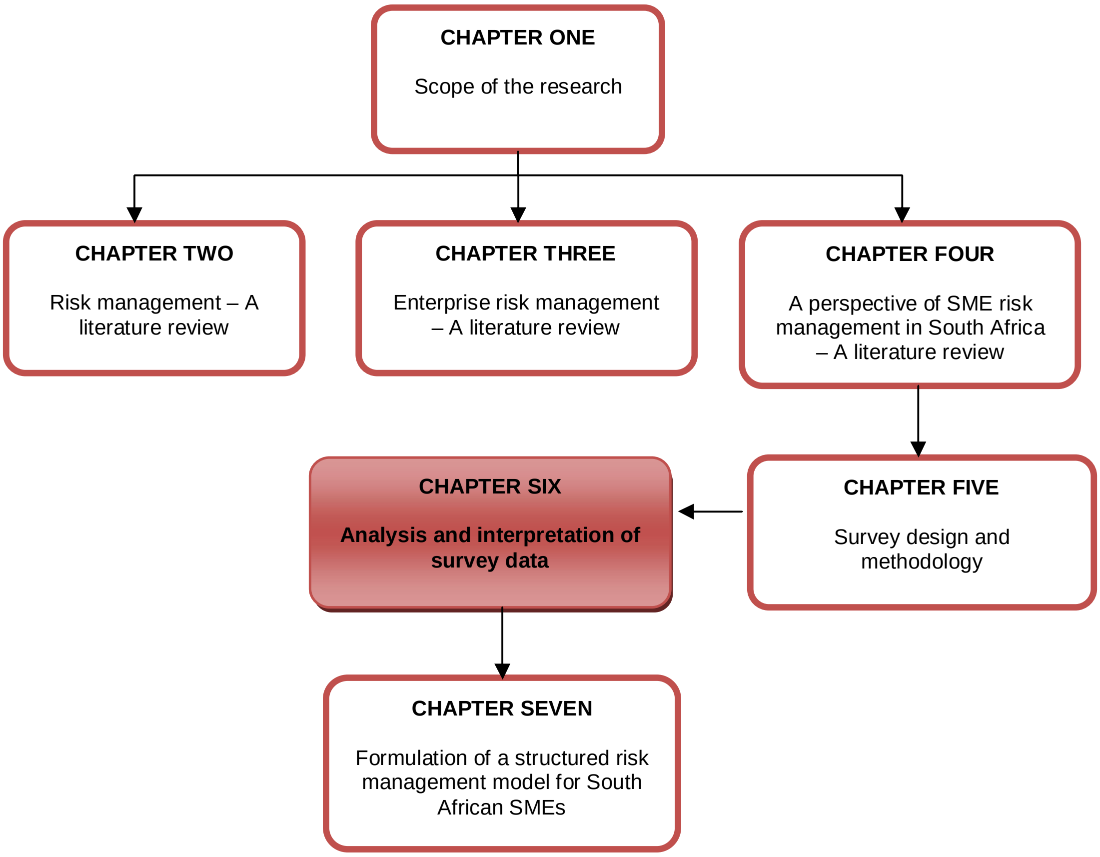


Figure 6.1: Chapter 6 - Analysis of results positioning.

This chapter discusses the results of the data analysis of the survey conducted on SMEs (micro- to small enterprises) in the Western Cape. Data analysis can be defined as “the process of bringing order, structure and meaning to the mass of collected data” (De Vos 2002:339). The main aim of this study is to determine whether a non-structured approach to risk management for South Africa SMEs adversely impacts on the risk efficiency of the industry. The data obtained from the completed questionnaires will be presented and analysed by means of various analyses (univariate, bivariate and multivariate) as it comes applicable.

The data has been analysed by using SAS software. Descriptive statistics such as frequency tables are displayed in Paragraph 6.3.2, showing the distributions of the statement responses. Descriptive statistics are used to summarise the data. As a measure of central tendency and dispersion, Table 6.3 shows the means and standard deviation of the statements with an ordinal/ratio scale of measurement.

6.2 ANALYSIS METHOD

6.2.1 Data validation and validation of survey results

In determining, through the use of a structured questionnaire, whether a non-structured risk approach by South African SMEs adversely impacts on the risk efficiency of the industry, the validity and reliability of the questionnaire is important. Validity is concerned with whether the actual measuring reflects the intended measure (Rose & Sullivan, 1996:19). For the purpose of this study, only content and construct validity will be elaborated upon. 'Content validity' is concerned with the representativeness or sampling adequacy of the content (e.g. topic or items) of a measuring instrument (De Vos & Fouche, 1998:84), while 'construct validity' refers to the extent that a measuring instrument can be shown to measure a particular hypothetical construct.

Below is a descriptive analysis of the survey results returned by the research questionnaire respondents. The responses to the questions obtained through the questionnaires are indicated in table format for ease of reference. Each variable is tested to fall within the set boundaries. The database in which the data was captured was developed so that data validation could be ensured. There are built-in boundaries and rules so that any mistakes made by the data capturer can be detected. Other measures taken to ensure data validity include capturing the information twice, whereafter comparisons were made to identify possible errors for correction. Data validation is the process of ensuring that a programme operates on 'clean', correct and useful data.

The construct validation however, can only be taken to the point where the questionnaire measures what it is supposed to measure. Construct validation as a rule is addressed in the planning phases of the survey and when the questionnaire is being developed. Reliability will be addressed in the analysis phase of the data (information).

6.2.2 Data format

The data was provided in its original format, i.e. questionnaires which were coded according to a predetermined coding scheme and captured twice on Microsoft Access. It was then imported into SAS through the SAS ACCESS module.

6.2.3 Preliminary analysis

The reliability of the statements in the questionnaire posted to the sample respondents are tested by using the Cronbach Alpha tests (see Paragraph 6.3.1). Descriptive statistics were performed on all variables, displaying means, standard deviations, frequencies, percentages, cumulative frequencies and cumulative percentages. These descriptive statistics are elaborated upon in Paragraphs 6.3.2 and 6.3.3 (see also computer printouts in Appendix B and Appendix C).

6.2.4 Inferential statistics

The following inferential statistics were performed on the data:

- **Chi-square tests:** Chi-square tests were used for determining the association between biographical variables. Cross-tabulation and Chi-square-based measures of association, a technique for comparing two or more classification variables, were used. These tables constructed for statistical testing, are referred to as contingency tables and determine whether the classification variables are dependent. Percentages are used for two purposes; firstly to simplify by reducing all numbers to a range of 0 to 100 and secondly, to translate the data into standard form, with a base of 100, for relative comparisons. The Chi-square (two-sample) tests are probably the most widely used non-parametric test of significance that is useful for tests involving nominal data, but it can be used for higher scales, e.g. scenarios where persons, events or objects are grouped in two or more nominal categories such as 'yes-no' or cases A, B, C or D. The technique is used to test for significant differences between the observed distribution of data among categories, and the expected distribution based on the null hypothesis and has to be calculated with actual counts rather than percentages (Cooper & Schindler, 2001:499).

- **Factor analysis:** Factor analysis is a statistical approach that can be used to analyse interrelationships among a large number of variables and to explain these variables in terms of their common underlying dimensions (factors).
- **Cronbach Alpha test:** Cronbach Alpha coefficient is an index of reliability associated with the variation accounted for by the true score of the 'underlying construct' with 'construct' being the hypothetical variables that are being measured (Cooper & Schindler, 2001:216-217). More specific, the Cronbach Alpha coefficient measures how well a set of items (or variables) measures a single unidimensional latent construct.
- **Log linear analysis:** Log linear analysis is a multivariate inferential statistical technique, which can be applied to contingency tables for the interpretation of qualitative categorical data.

6.2.5 Technical report with graphical displays

A written report with explanations of all variables and their outcome were compiled. A cross-analysis of variables where necessary was performed, attaching statistical probabilities to indicate the magnitude of differences or associations.

All inferential statistics are discussed in Paragraphs 6.3.4.

6.2.6 Assistance to researcher

The conclusions made by the researcher, were validated by the statistical report. A professional statistician provided input to interpret the outcome of the data. Reciprocally, the final report written by the researcher was validated and checked by the statistician to exclude any misleading interpretations.

6.2.7 Sample

The target population is represented by owner-managers of retail SMEs in the Western Cape. Purposive sampling was used to select the sample.

6.3 ANALYSIS

In total 158 questionnaires were answered completely. The items (statements) in the questionnaire will be tested for reliability in the following paragraph.

6.3.1 Reliability of the research instrument

The reliability test (Cronbach Alpha coefficient) was executed on all the items (statements), which represent the measuring instrument of this survey, with regard to the responses rendered in this questionnaire. Q17_07 ('Other') had only 'no' responses, and as a result was excluded from the Cronbach Alpha test. Due to the fact that the responses on the 'None' categories in questions 6, 15, 17, and 20 will be negatively correlated to the responses to the other categories for those questions, a transformatory change was made to these questions, to indicate the opposite. These question categories are included in the Cronbach Alpha test, and are identified by a 'n' at the end of the question name. The results as presented in Table 6.1 and Appendix C are based on statements, which were completed by all the respondents. Due to the voluminous nature of the data, Table 6.1 is contained within the ambid of Appendix C1.

The Cronbach Alpha coefficients (refer Table 6.1) for all the items serving as measuring instrument in the questionnaire are:

- 0,7599 for raw variables, and
- 0,8267 for standardised variables,

which are more than the acceptable level of 0,70 (Nunnally, 1978:248-292). These items are therefore proven to be reliable and consistent. The Cronbach Alpha coefficients of the standardised variables are included in Table 6.1, because the scale differed for some of the variables.

6.3.2 Descriptive statistics

Table 6.2, as contained in Appendix C2, shows the descriptive statistics for all the variables in the questionnaire measuring the different risk management factors of South African SMEs, with the frequencies in each category and the percentage out of the total number of questionnaires completed. It is of importance to note that the descriptive statistics are based on the total sample. In some cases, no answers were given which will be reflected as 'unknown' in the descriptive statistics. These descriptive statistics are also contained in Appendix B and Appendix D.

Table 6.3 shows the descriptive statistics (number of responses, mean, standard deviation, median and range) for all the variables with an ordinal scale.

Table 6.3: Descriptive statistics for all variables (mean, median, standard deviation and range).

Variable		N	Mean	Std dev	Median	Range
9.1	Management risk	157	2.86	1.3981	3.0	4
9.2	Commercial risk	157	2.79	1.3206	3.0	4
9.3	Technological risk	157	3.01	1.5063	3.0	4
9.4	Financial risk	157	2.60	1.4709	2.0	4
9.5	Entrepreneurial risk	157	3.28	1.4669	3.0	4
11.	To what extent are risks discussed in your business strategy planning?	158	2.45	1.2797	2.0	4
12.	To what extent are risks discussed in your business operational planning?	158	2.28	1.1235	2.0	4
13.	To what extent are risks discussed in your business financial planning?	158	1.94	1.0662	2.0	4
16.	How would you characterise the status of your risk management framework?	158	3.21	1.3309	3.0	4
19.	How do you implement or plan to implement risk management activities?	158	2.60	1.5349	3.0	4

Questions 9.1 - 9.5 measure the importance of the risk in question with '1' being 'very important' and '5' the 'least important'. Questions 11 - 13 measure the extent with which the risk is discussed for different areas of the business, where '1' is 'highly discussed', '2' is 'medium discussed', '3' is 'lowly discussed', '4' is 'unknown' and '5' is 'not discussed'. As a result, the higher the value, the less the risk is discussed for that area. Question 16 indicates that '1' means that 'a comprehensive risk management framework is in place', whilst '5' means there is 'no risk management framework in place and none is planned'. Question 19 indicates that '1' means that 'a holistic risk management framework is implemented or planned to be implemented' and 2, 3, and 4 reflect the three types of incremental implementation, while '5' indicates the 'not applicable' category.

The rest of the questions/statements are dichotomous in nature (yes/no responses), and are described in the frequency table.

6.3.3 Univariate graphs

The survey returned that more than 20% of the respondents indicated that the annual turnover of their businesses were between R150 000 - R300 000, placing them within the microenterprise category (refer to Figure 6.2). Nearly 60% of the businesses had a turnover of less than R1 million, indicating that the majority of enterprises fall within the boundary of micro-, very small and small enterprises as determined by this research study.

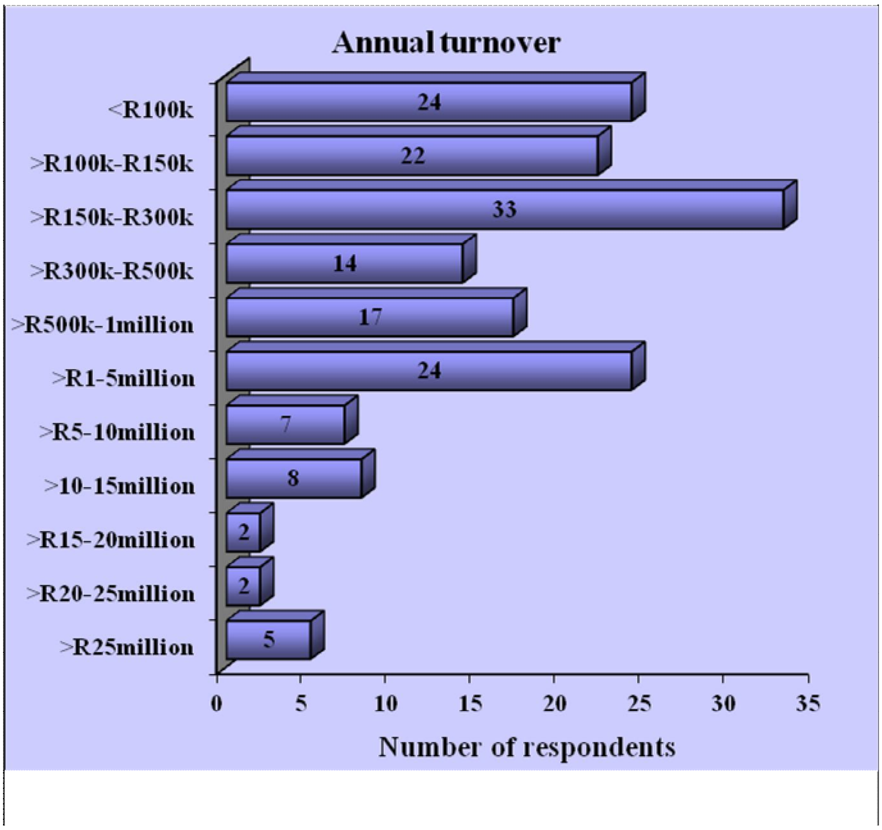


Figure 6.2: Annual turnover.

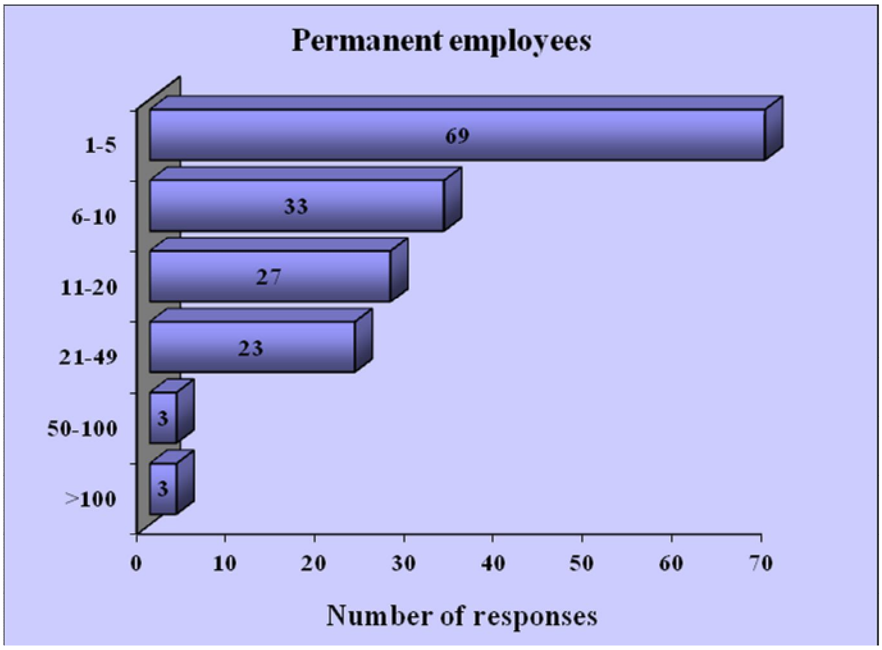


Figure 6.3: Number of permanent employees.

More than 80% of the businesses (refer to Figure 6.3), have 20 or less permanent employees in their service, placing them in the very small and microcategory according to the fulltime employed, permanent employment category of the National Small Business Act (South Africa, 2004:Online). Only 2% of respondents indicated a work force in excess of 100, which places their organisation in the medium enterprise category.

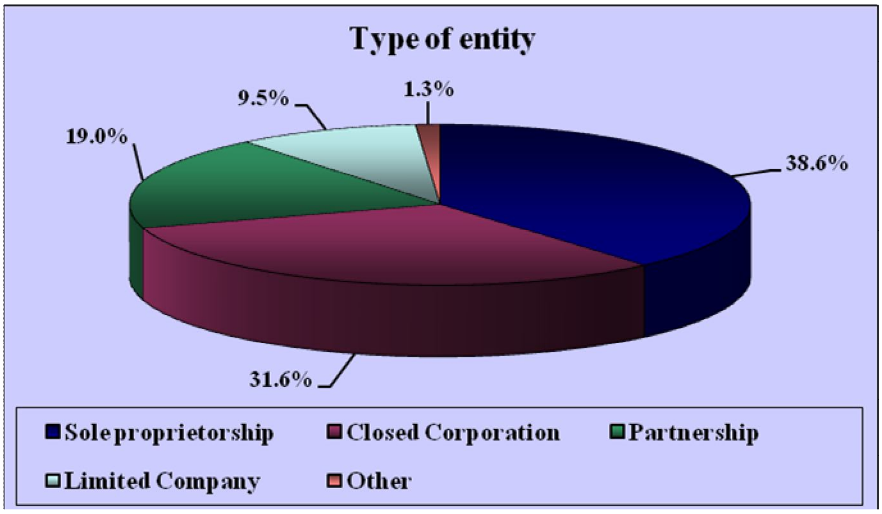


Figure 6.4: Type of entity.

The type of corporation (refer to Figure 6.4), is mostly sole proprietorship or close corporations (70%), with the minority of enterprises (10,8%) operating as limited companies or other forms of enterprises.

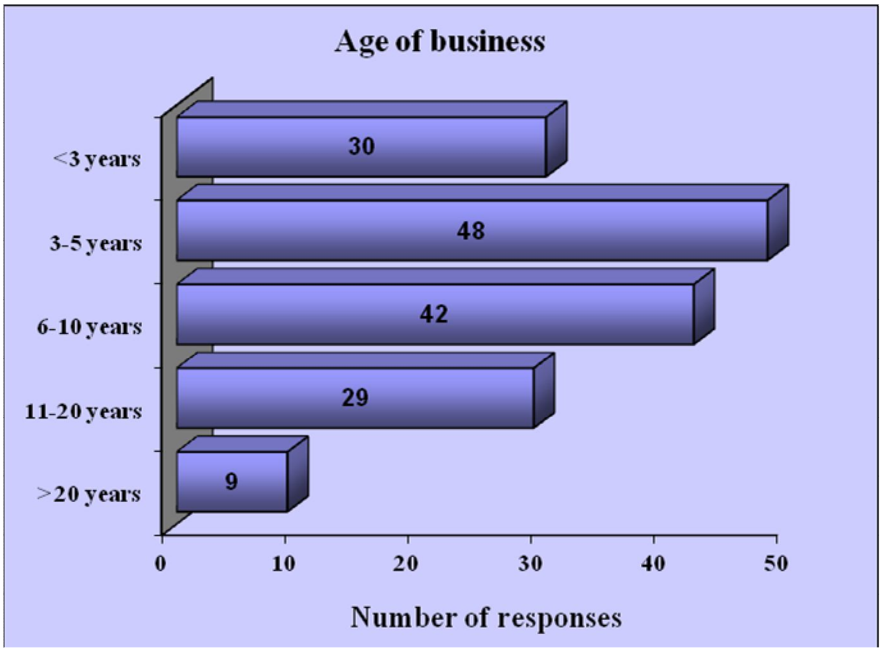


Figure 6.5: Age of business.

Nearly 50% of the businesses are relatively young and less than 6 years in business (refer to Figure 6.5). Only 5,7% of enterprises surveyed indicated an operational age exceeding 20 years. It can be argued that the high prevalence of financial problems experienced by enterprises as depicted in Figure 6.9, may have a direct or indirect effect on enterprise age.

Nearly 70% of the business owners have some type of qualification (refer to Figure 6.6), after completion of their matriculation, which indicates a highly educated entrepreneurial sample population. The highest category of post-matriculation qualification is a diploma (25,9%), followed by a degree (17,1%). Only 5,1% of business owners hold less than a grade 10 certificate.

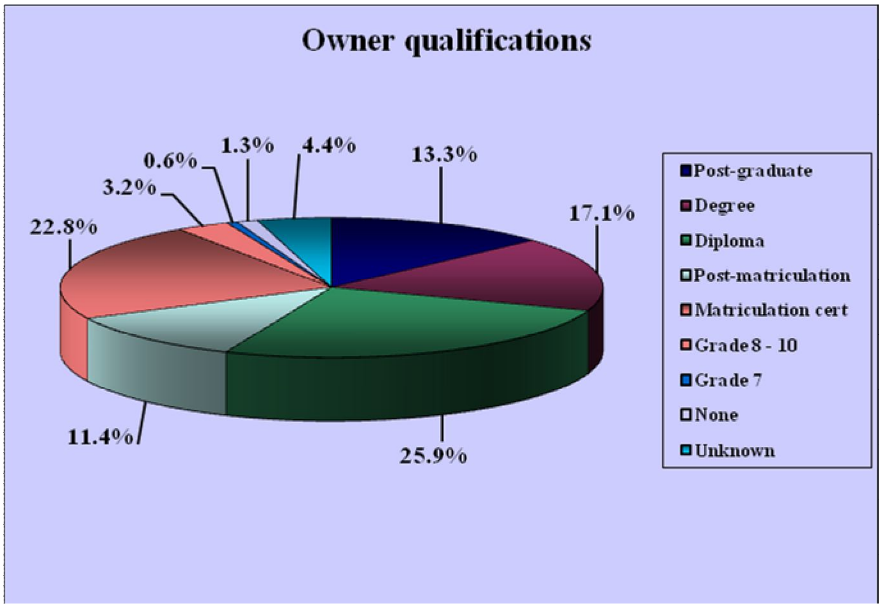


Figure 6.6: Owner qualifications.

More than 60% of the executive managers (refer to Figure 6.7), have some qualification after completing their matriculation, which maps to the high percentage of owners depicted in Figure 6.6 with post-matriculation qualifications. Only 2,5% of executive managers hold less than a grade 10 certificate. From the above the obvious analogy can be drawn that SME management teams in this survey, comprising owners and/or managers are therefore well-educated individuals, but this falls in sharp contrast to the small percentage (5,7%) of enterprises (refer to Figure 6.5), who survived and operates beyond 20 years.

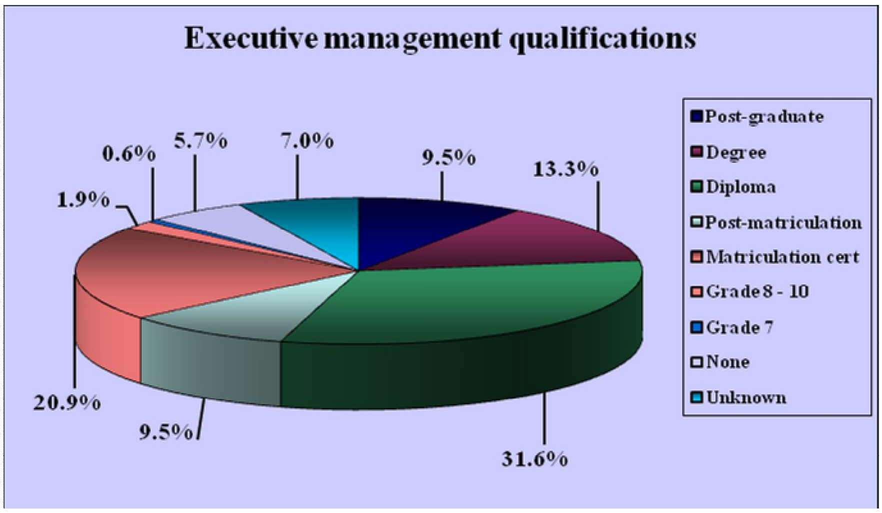


Figure 6.7: Executive management qualifications.

Financial management, marketing management and information technology were the areas that received most support from external consultants (refer to Figure 6.8). This can arguably be attributed to the highly specialised nature of especially financial and information technology areas. In contrast, human resources and public relations management received the least amount of support from external consultants. The limited amount of external support received regarding human resource matters can arguably be ascribed to the small employment base of SMEs as shown in Figure 6.3.

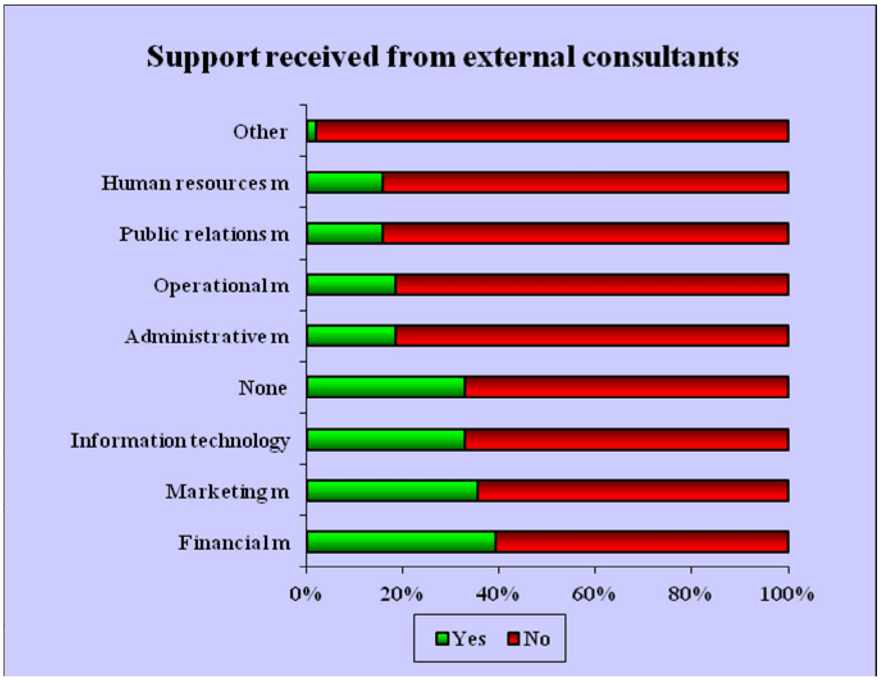


Figure 6.8: Support received from external consultants.

More than 60% of the respondents indicated that they had experienced financial problems in the past (refer to Figure 6.9). It is of importance to note that this question was changed from ‘experiencing no problems’ to ‘experiencing problems in the past’ culminating in the ‘yes’ answers becoming ‘no’ and the ‘no’ answers becoming ‘yes’. Only 38,6% of respondents indicated that their enterprise had no history of financial problems, which is of interest considering the previously mentioned low survival rate of enterprises, depicted as enterprise age in Figure 6.5.

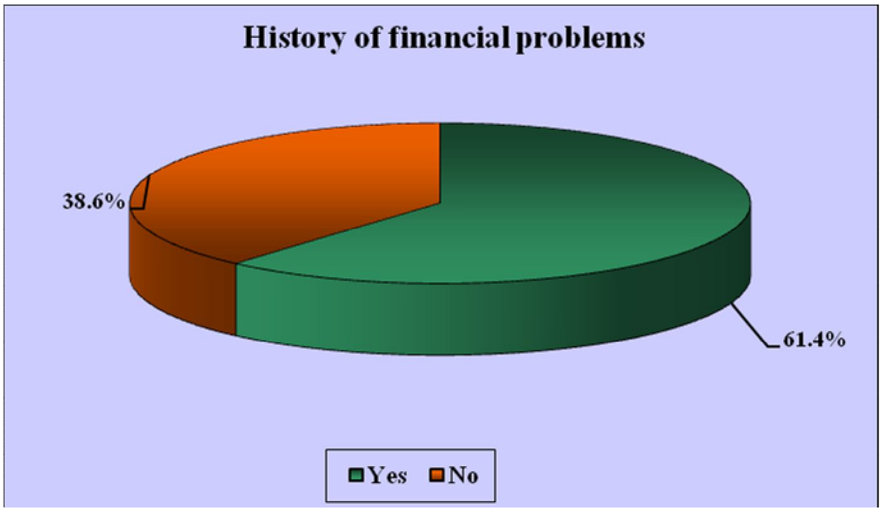


Figure 6.9: History of financial problems.

The main reason for experiencing financial problems relates to theft of business resources (38,6%), followed by inefficient budgeting/overspending (27,8%) (refer to Figure 6.10). The areas contributing the least to financial problems are the occurrence of catastrophic events (8,8%), followed by information technology inefficiencies (19%).

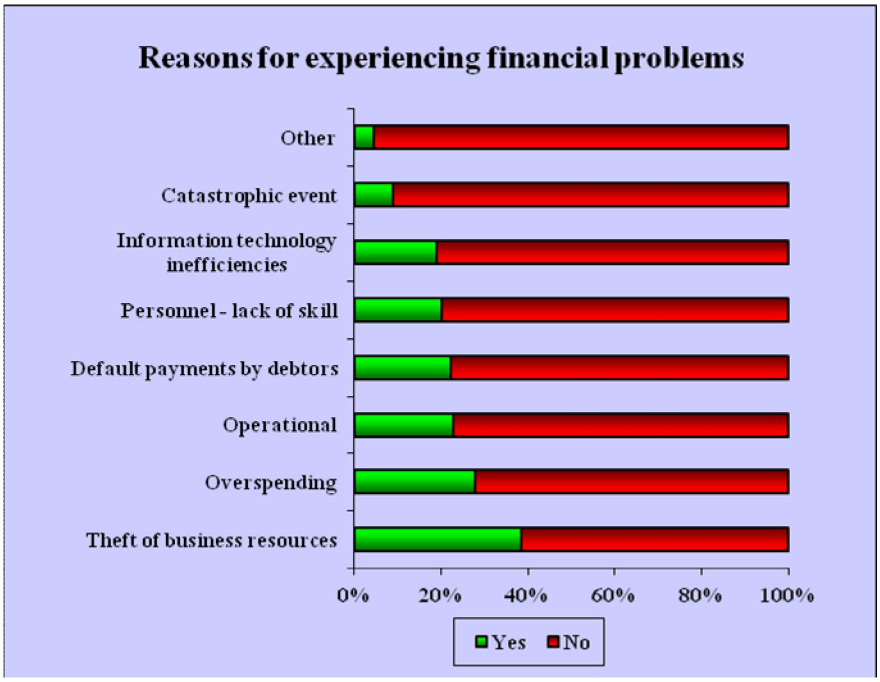


Figure 6.10: Reasons for experiencing financial problems.

More than 85% of the respondents as shown in Figure 6.11, indicated that their businesses had clearly defined business objectives and strategies, which positively map to their understanding of their risks (Figure 6.13), and the impact that such risks can have on business objectives and strategies.

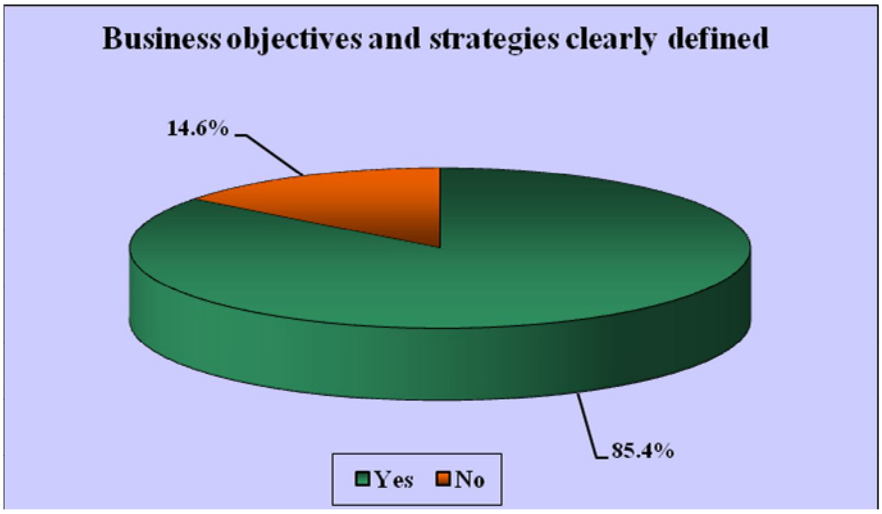


Figure 6.11: Business objectives and strategies clearly defined.

Out of five different risk categories, financial risk is indicated as the risk which is perceived as the most important (refer to Figure 6.12). Entrepreneurial risk, described as the age, experience and training of owner and/or manager, followed by technological risk, described as problems with suppliers and equipment, inadequate production structures, absence of technological development monitoring, absence of research and development, and an absence of continuous improvement activities, rate as the least important risks for SMEs.

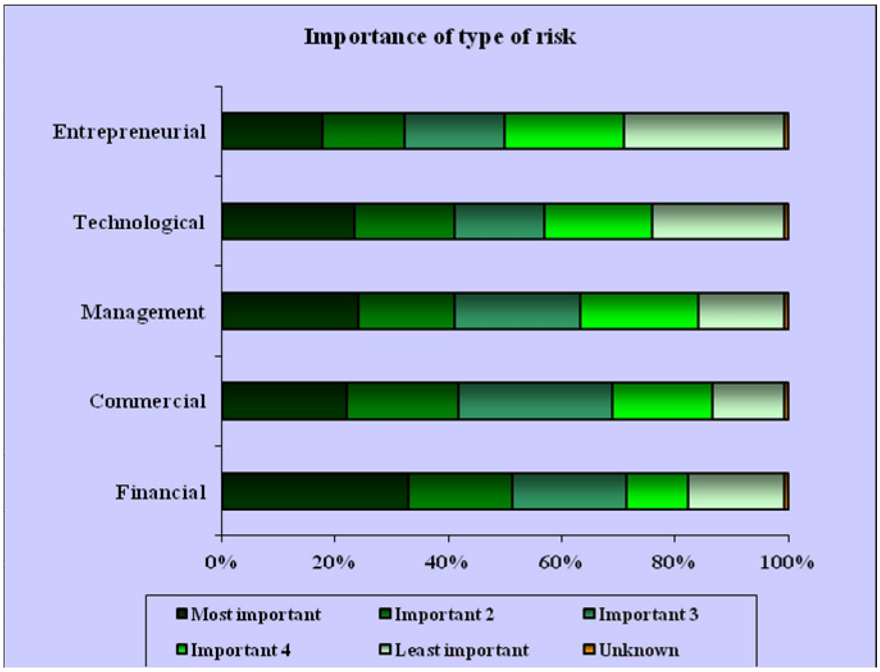


Figure 6.12: Importance of type of risk.

More than 87% of the respondents (refer to Figure 6.13), indicated that they had a clear understanding of the risks impacting on their business structure and processes. This understanding clearly manifests in a financially orientated focus as depicted in Figures 6.12 and 6.14.

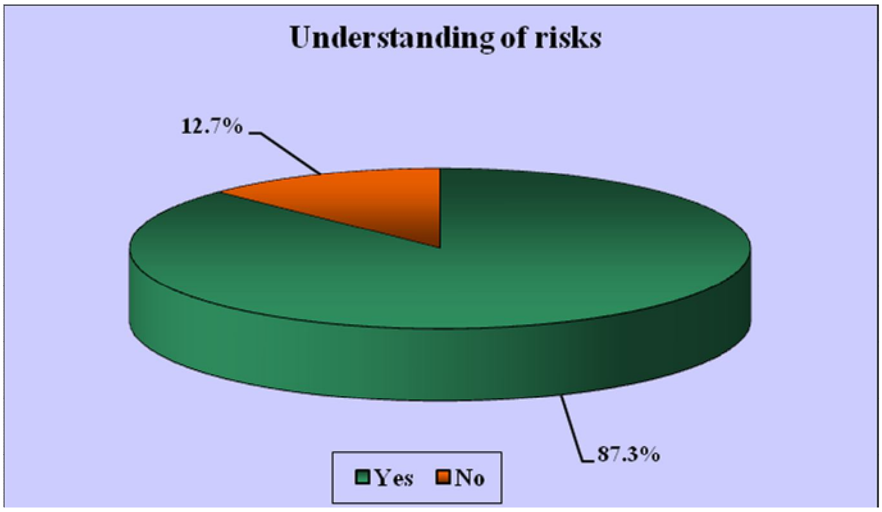


Figure 6.13: Understanding of risks.

Risk discussions feature more prominently during the financial planning phase compared to operational and strategic planning discussions (refer to Figure 6.14). It is of interest to note that discussions pertaining to risks feature the least during strategic planning activities, although survey results indicate that more than 85% of enterprises have clearly defined business objectives and strategies (refer to Figure 6.11). The adequacy of the process for the defining of enterprise objectives and strategies is therefore questionable, in that risks which impact significantly on strategy, are not discussed extensively.

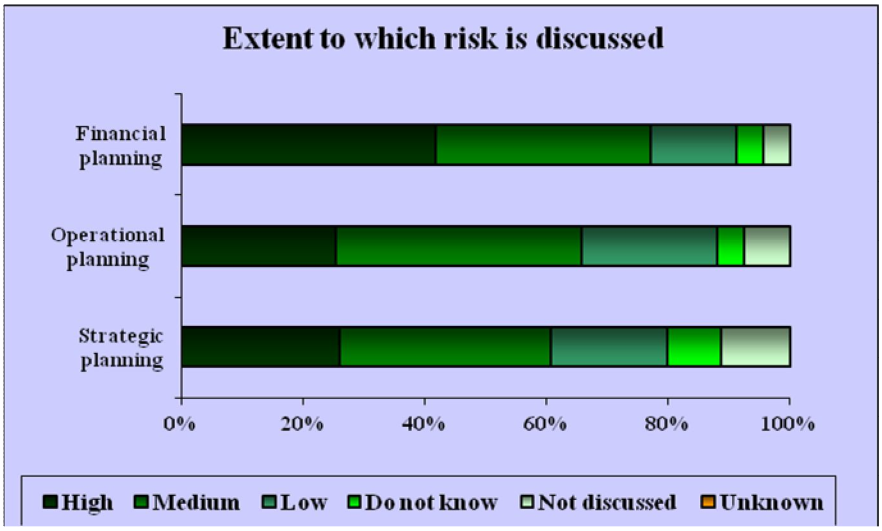


Figure 6.14: Extent to which risk is discussed.

The majority of respondents (61,4%) as depicted in Figure 6.15, indicated that they were interested in a risk framework citing profit-maximising (88,0%), improved customer service (82,3%), minimising of cost (77,8%) and safeguarding of assets (70,9%) as the primary motivating factors. Internal compliance, e.g. organisational policies and procedures and regulatory compliance, e.g. labour relations, safety and health, and income tax legislation, feature as the least important motivating factors for the implementation of a risk framework. The relative small size of enterprises surveyed, i.e. 44% of enterprises have five or fewer permanent employees (refer to Figure 6.3), implies a more enterprise-involved owner-manager/employee relationship, where internal compliance activities and regulatory compliance activities are implicitly enforced and not a formally documented process. For a comprehensive list of motivating factors for risk framework implementation, refer to Figure 6.16.

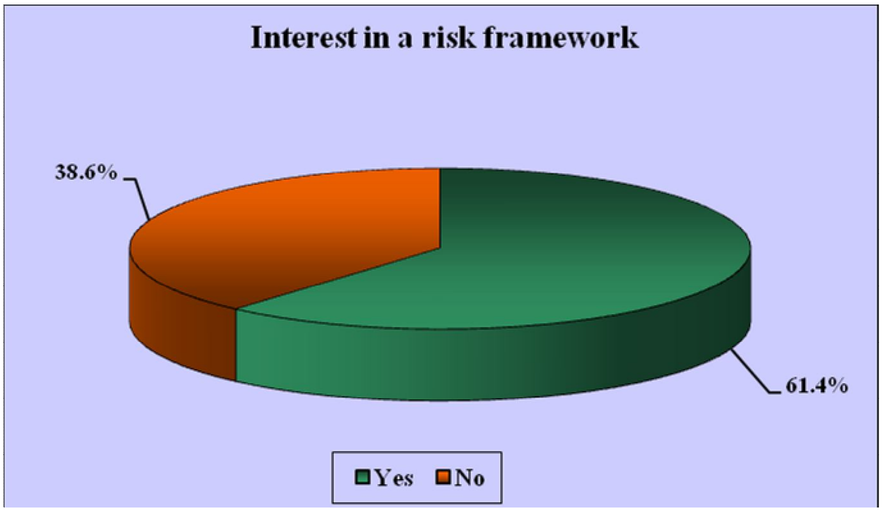


Figure 6.15: Interest in a risk framework.

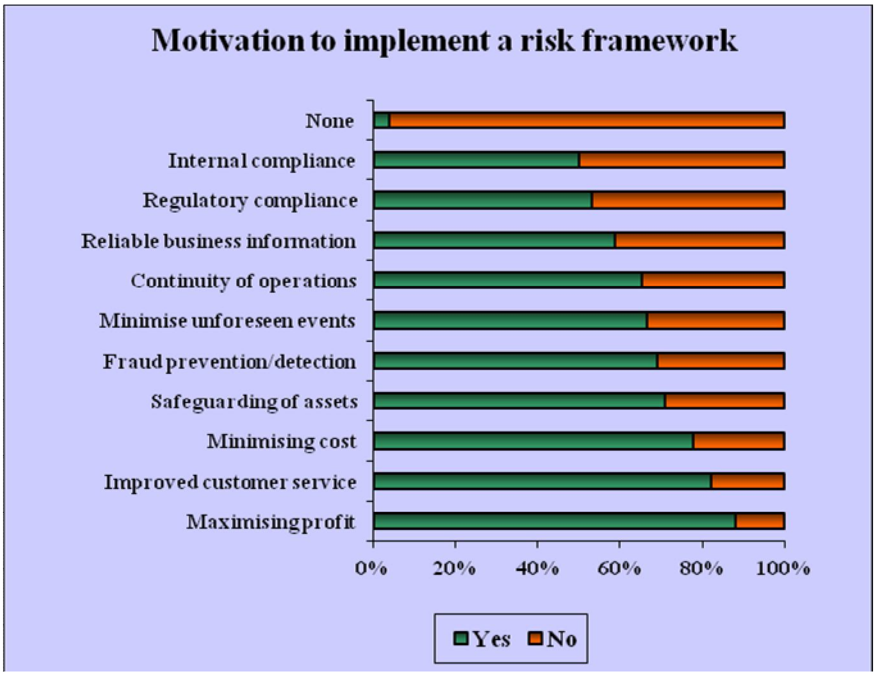


Figure 6.16: Motivation to implement a risk framework.

The current status of SMEs' risk management framework is depicted in Figure 6.17. The following pertains to the risk management framework of the SMEs surveyed:

- 27% of enterprises have a complete or partial risk management framework in place.
- 37,3% of enterprises do not have a risk management framework, but are planning to implement one.

- 24,6% of enterprises do not have a risk management framework, and are not planning to implement one.
- Taking cognisance of enterprises' financial focus (Figures 6.12 and 6.14), the financial aspect will probably dominate the risk framework of the 37,3% of enterprises planning to implement a risk management framework.

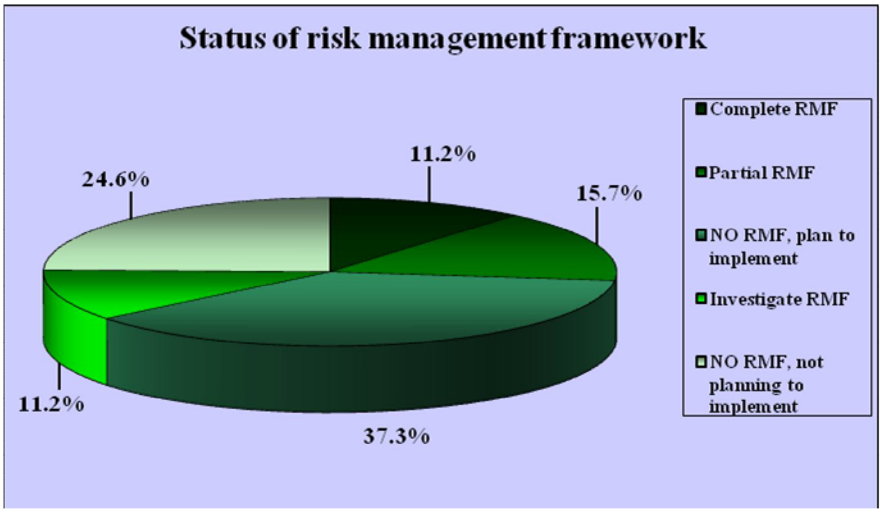


Figure 6.17: Status of risk management framework.

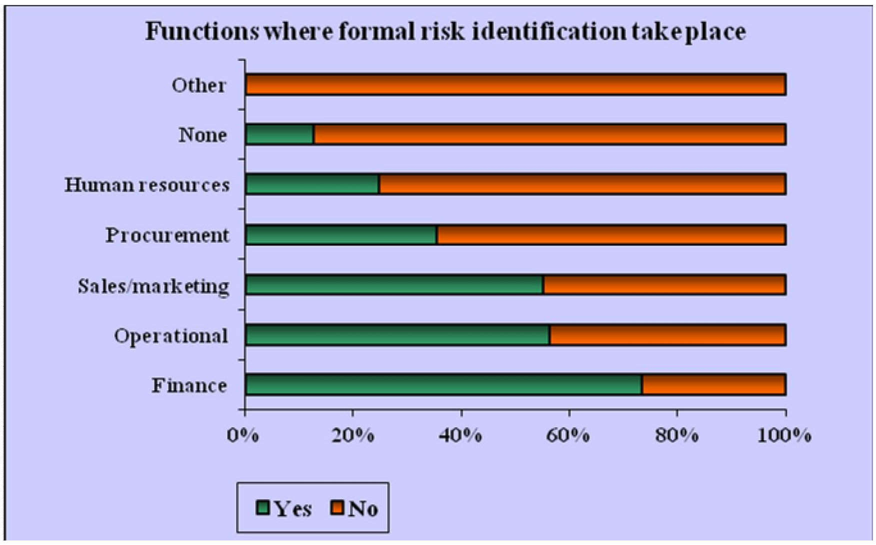


Figure 6.18: Functions where formal risk identification takes place.

The areas where formal risk identification occurs (refer to Figure 6.18), map to the focus of the respondents' enterprises (refer to Figures 6.12 and

6.14), and were primarily finance (73,4%), operational activities (56,3%), and sales/marketing processes (55,1%), with human resource functions the least prone to risk identification.

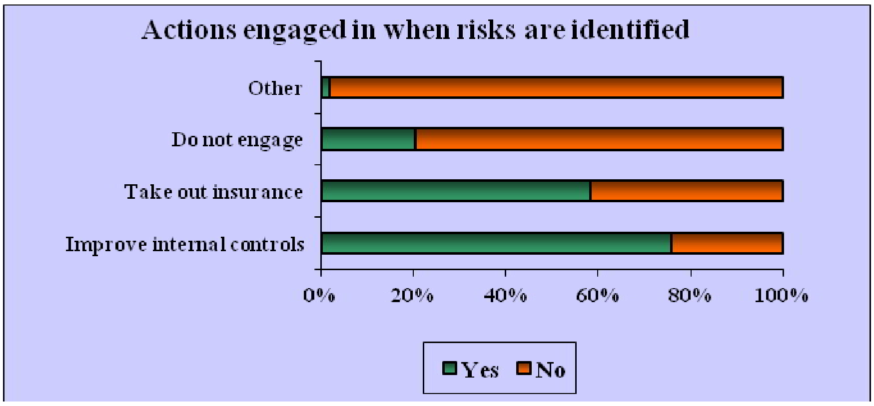


Figure 6.19: Actions engaged in when risks are identified.

When risks are identified in primarily the financial, operational and sales/marketing areas, organisational action primarily encompasses the following (see Figure 6.19):

- ➢ Improvement of internal controls (73%) and
- ➢ Taking out of insurance (58,2%).

As entrepreneurial activities imply the taking of risks, the anticipated results pertaining to risk actions deployed in risk identification, map to the survey results showing that the least popular risk action taken by management is 'not engaging in the activity'.

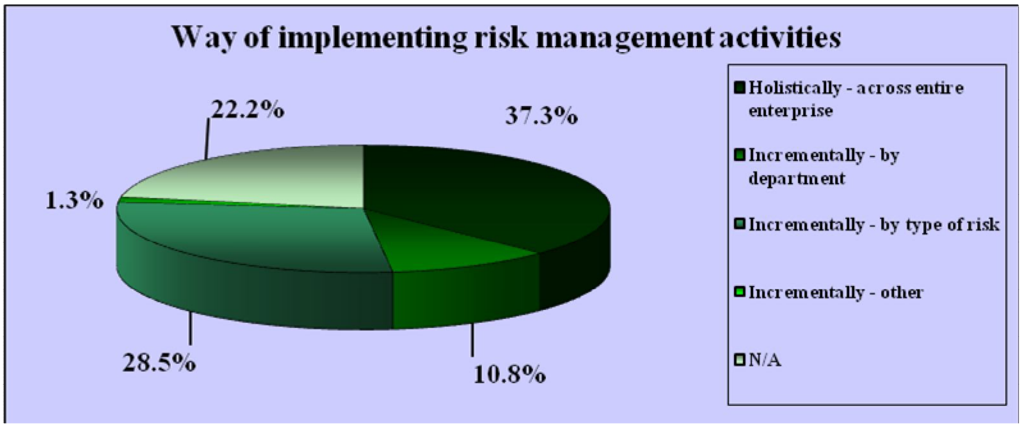


Figure 6.20: Way of implementing risk management activities.

More than a third of the respondents (37,3%) indicated the way they would prefer to implement or plan to implement risk management activities, is holistically, thereby across the entire enterprise. Departmental risk focus would be the preference of 10,8% of respondents, while 28,5% of respondents would prefer risk management activities to focus on the type of risks (refer to Figure 6.20). As risk management processes are optimised if implemented holistically, it is of concern that almost two-thirds of respondents preferred other types of risk management implementation. This may be attributed to the obstacles experienced to implementing a risk management framework with cost factors (44,3%), lack of skills or expertise (32,9%) and lack of formalised processes (29,8%), as the main obstacles faced. From the survey results, SME owner-managers interviewed seemed to be aware of the value of a risk management framework, as 'not perceived as a priority' and the 'benefit does not justify the effort' are the least probable obstacles experienced to implementing a risk management framework (refer to Figure 6.21).

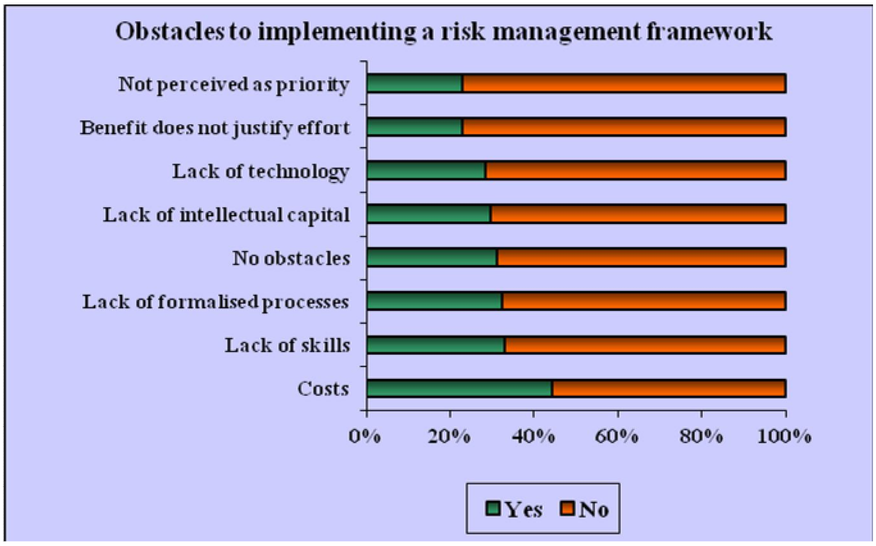


Figure 6.21: Obstacles to implementing a risk management framework.

Respondents were provided the option of receiving feedback to this study, and 39,2% of them indicated that they would like to receive such feedback (refer to Figure 6.22).

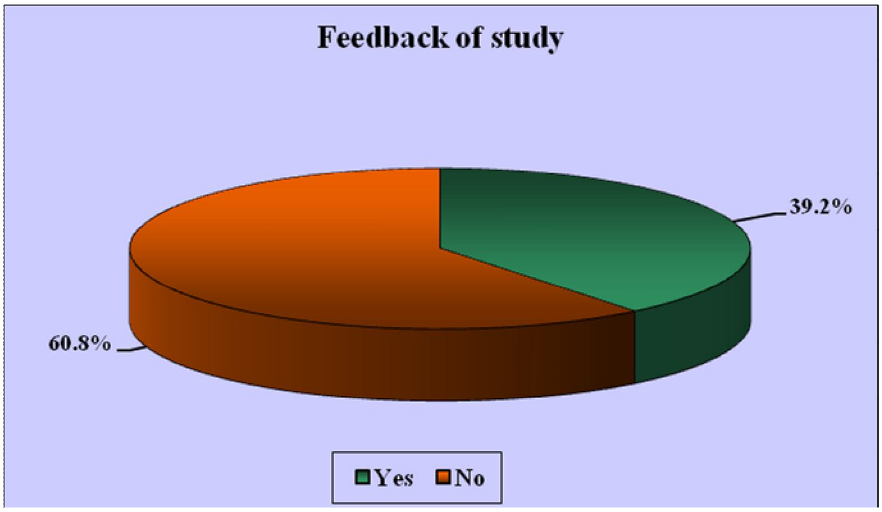


Figure 6.22: Feedback of study.

6.3.4 Factor analysis

Due to the fact that some questions/statements had multiple answers and were captured separately, some transformatory changes were made to these statements in order to elicit only one answer. To ensure that there were not different constructs in a question/statement with different answers, a factor analysis was done to show the underlying constructs of the questionnaire.

An exploratory factor analysis was used to determine the factor structure underlying the set of originally observed variables that represented the measurements regarding risk management in the SMEs. Per definition, factor analysis identifies the nature and number of latent factors responsible for co-variation in the data analysis. Results, including the rotated factor pattern and communality estimates of the exploratory factor analysis are shown in Table 6.4 and Appendix E. The communality refers to the percentage of variance in an observed variable that is accounted for by the retained factors (Hatcher, 1994:67).

Table 6.4: Original variables and corresponding factor loadings from the rotated factor pattern.

Factor pattern								Final communality estimates	Questionnaire statements
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**		
79	0	8	20	8	8	3	16	0.6658	Q20_1n
74	1	3	29	18	23	13	-4	0.5720	Q20_7
63	-19	-10	20	13	9	-3	-7	0.4299	Q20_8
65	-8	4	24	27	19	10	-6	0.4572	Q20_5
59	4	-1	31	27	16	-11	11	0.4353	Q20_3
50	15	-2	1-	21	1	8	-26	0.4080	Q20_4
53	-22	0	9	3	12	4	0	0.3166	Q20_6
40	0	7	-9	-5	12	-7	20	0.2660	Q20_2
-13	81	17	-17	7	6	-1	11	0.6732	Q11
-17	78	22	-15	9	13	25	12	0.6807	Q12
-7	75	16	-2	18	5	19	17	0.5966	Q13
-21	48	39	7	15	8	16	-24	0.4588	Q16
-2	12	66	9	4	0	-17	10	0.5243	Q06_04
-10	28	60	7	1	5	-3	0	0.4211	Q06_07
-4	13	55	-4	-10	-1	1	2	0.3366	Q06_06
8	-5	58	1	7	7	41	11	0.5145	Q06_01
16	22	66	22	18	4	54	5	0.6722	Q06_08n
1	1	53	0	0	-1	5	-4	0.2893	Q06_03
4	20	58	26	4	5	37	-17	0.4753	Q06_02
17	11	49	10	17	6	48	0	0.4323	Q06_05
27	-16	3	85	6	2	-13	-6	0.7775	Q07_1_1n
15	-6	0	65	15	17	-9	8	0.4757	Q07_2_02
23	-21	2	69	20	24	3	-21	0.5558	Q07_2_03
8	1	4	42	-4	-2	18	11	0.2689	Q07_2_01
12	8	13	49	15	-	-12	-14	0.2903	Q07_2_04
17	21	22	45	28	14	4	-15	0.3113	Q14
24	-16	6	44	16	2	-10	-36	0.3443	Q07_2_05
16	10	7	16	77	10	12	-2	0.6195	Q15_03
7	10	-5	15	71	29	-7	-8	0.5345	Q15_11n
11	1	7	9	64	25	10	5	0.4351	Q15_01
31	-2	7	18	58	32	15	16	0.4360	Q15_02
18	21	14	10	17	75	-6	13	0.6095	Q15_06
17	9	3	26	24	73	6	1	0.5773	Q15_07
8	23	8	6	33	62	-27	19	0.5119	Q15_09

Factor pattern								Final communality estimates	Questionnaire statements
1	2	3	4	5	6	7	8		
12	2	-4	14	43	59	10	-1	0.4442	Q15_05
22	7	-1	22	41	57	1	17	0.4146	Q15_10
13	-1	-4	2	40	49	-30	19	0.4193	Q15_08
23	15	5	7	45	51	-7	18	0.3909	Q15_04
10	39	17	-3	4	4	58	16	0.4861	Q18_02
-2	21	10	6	25	-2	3	52	0.3911	Q09_04
1	14	0	2	-4	15	-2	49	0.2823	Q09_01

Note to the reader: All the loadings are multiplied by a 100 and rounded off to the nearest integer.

Measurements regarding risk management were subjected to an exploratory factor analysis using Squared Multiple Correlations (SMC) as prior communality estimates. The principal factor method was used to extract the factors, followed by a promax (oblique) rotation. A scree test suggested eight meaningful factors, resulting in only these factors being retained for rotation.

In interpreting the rotated factor pattern, an item was said to load on a given factor if the factor loading was 0,40 or greater for that factor, and was less than 0,40 for the other. In total 41 items loaded on a given factor according to abovementioned criteria. The items that had loadings on more than one factor were supposed to be deleted from the analysis, but due to the understanding of the different meanings of the statements (items) they were retained and are elaborated upon in the following paragraph. Using these criteria, eight items were found to load on the first factor, was subsequently labelled the ‘Barrier to implement RMF factor’. Four items loaded on the second factor, was labelled the ‘Existence of structured risk management approach factor’. Eight items loaded on the third factor, was labelled the ‘External Support to business factor’, seven items loaded on the fourth factor was labelled the ‘Experiencing of problems by business factor’, four items loaded on the fifth factor was labelled the ‘First motivation to implement RMF factor’, seven items loaded on the sixth factor was labelled the ‘Second motivation to implement RMF factor’, one item loaded on the seventh factor was labelled the ‘Improvement of internal controls factor’, and two items loaded on the eight factor which was labelled the ‘Importance of risk (in management & finance) factor’.

The sixth factor had loadings on the fifth factor as well, but due to the meaning of the statements (items), which all came down to motivation to implement a risk management framework, the items that loaded both on the fifth and sixth factor were kept in the factor, that it loaded on the most.

The second factor is the factor that shows the existence of a risk framework and is used as the dependent variable in the following tests to test whether a structured risk management framework, as opposed to a non-structured risk management framework, has any influence on a business.

Spearman rank correlations were calculated to determine whether there existed a relationship between factor 2 and the other factors or items (variables). Factor 2 was positively correlated to factors 3 and 5 and as a result the existence or non-existence of a structured risk management framework was correlated with the factor, which indicated that businesses received external support, with the factor that indicated the first tier of motivation to implement a risk management framework.

6.3.5 Chi-square tests

The following steps were taken to test the main aim of this research namely, whether companies without a structured risk management approach are adversely affected with respect to their risk efficiency:

- Firstly, it was necessary to determine which measurement(s) indicate the presence or non-presence of a structured approach to risk management, which was then viewed as the ‘dependent variable’.

- Secondly, all the other variables indicating the nature of the business in the likes of risk efficiency and whether there are problems regarding certain aspects in the companies, was then viewed as the 'response variables'.
- Thirdly, as the characteristics of the data in this research is categorical in nature (nominally and ordinally scaled) and to determine the relationship between the dependent and response variables, each variable was compared with the dependent variable (presence or non-presence of a structured approach to risk management) by means of a Chi-square test. The Chi-square test was to show whether the modes of classification are independent.
- When it was determined which variables were associated with the dependent variable (presence or non-presence of a structured approach to risk management), a log linear analysis was executed to determine the best model for the information.

The dependent variable was defined as a combination of variables/questions 11, 12, 13 and 16. As these variables loaded strongly on factor 2, which represented the existence of a structured risk management approach in the company (shown in previous paragraph 6.3.4), the 'dependent variable' was defined as:

a. Yes, a structured risk management approach exists in the company, and

b. No, a structured risk management approach does not exist in the company; by

combining questions 11, 12, 13 and 16 as follows:

- If the respondent answered medium or high on 11, 12, and 13 (it means risk is taken up in strategic, operational and financial planning) and if the respondent indicated the company had a complete or partial risk management framework in place in question 16, then it was assumed that the respondent's company had a structured approach to risk management and the dependent variable/question indicated 'Yes'.

- If the respondent answered differently from above, then the respondent's company did not have a structured approach to risk management and the dependent's question will indicate 'No'.

The definition of the dependent variable is also shown as it was programmed for SAS:
IF (q11 EQ **1** OR q11 EQ **2**) and (q12 EQ **1** OR q12 EQ **2**) and (q13 EQ **1** OR q13 EQ **2**) and (q16 EQ **1** or q16 EQ **2**) THEN new1=**1**;
IF new1 NE **1** THEN new1=**2**;   Where new1=1 means 'yes' a structured risk management approach was followed in the company, and new1=2 means 'no' a structured risk management approach was not followed in the company. It is of importance to note that 'New1' is the name of the variable indicating the presence or non-presence of a structured approach to risk management. Furthermore, it is of importance to note that the emphasis fell on a structured risk management approach and not only on the existence of a risk management framework.

The tables and graphs as shown in Appendix F indicate statistically significant associations between the dependent variable and response variables. Although only the statistically significant associations are mentioned in Appendix F, it is of importance to note the absence of statistically significant associations. All the Chi-square tests are shown in Appendix G.

SAS computes a p-value (probability value) that measures the statistical significance derived from the test values like the Chi-square. Results were regarded as significant if the p-values were smaller than 0,05, because this value presents an acceptable level on a 95% confidence interval ($p \leq 0{,}05$). The p-value is the probability of observing a sample value as extreme as or more extreme than the value actually observed, given that the null hypothesis is true. This area represents the probability of a type 1 error that must be assumed, if the null hypothesis is rejected (Cooper & Schindler, 2001:509).

The p-value was compared to the significance level (α), and on this basis the null hypothesis is either accepted or rejected. If the p-value was less than the significance level, the null hypothesis was rejected (if p-value $<\alpha$, reject null). If the p-value is greater than or equal to the significance level, the null hypothesis was not rejected (if p-value $\geq\alpha$, do not reject null). Thus, with α=0,05, if the p-value is less than 0,05, the null hypothesis will be rejected. The p-value is determined by using the standard normal distribution. A small p-value represents the risk of rejecting the null hypothesis.

A difference has statistical significance if there is good reason to believe the difference does not represent random sampling fluctuations. Results will be regarded as significant if the p-values are smaller than 0,05, because this value is used as cut-off point in most behavioural science research.

It is of importance to note that some of the categories were collapsed to fewer categories, to meet the requirements of sufficient expected frequencies (these expected frequencies should all be greater than one and in no more than 20% of the cells should they be less than 5).

Significant associations between the dependent variable and the response variables are depicted in Appendix F. It is of interest to note that statistically significant more SMEs that did not have a structured risk management approach, was smaller organisations. Such SMEs do not engage in risk identification processes and have an insufficient understanding of the risks impacting on their business processes. Furthermore, such SMEs prefer avoiding high-risk situations and they do not engage in the improvement of internal controls. Lack of intellectual capital and skills, as well as costs, are obstacles experienced by these SMEs, which limit their application of a structured risk management approach.

6.3.6 Log linear analysis

The log linear analysis was executed because the two-way Chi-square tests:

- Did not enable one to detect three-way or higher order interactions.
- Did not allow for the simultaneous examination of the pair-wise relationships.

The log linear analysis in this research was therefore used to determine the relationship between a structured risk management approach and risk efficiency of South African SMEs. This is represented by the association and interaction between ‘new1’ and the various other variables that can predict whether a company has a structured or non-structured risk management approach. The log linear analysis was also used because it is a multivariate statistical technique, which can be applied to contingency tables for the interpretation of qualitative or categorical data.

Because multivariables/multiway frequency analyses are used for the classification, the cells become smaller. The way the original questionnaire was set up means there was more than one question that represented one aspect or one construct as the factor analysis also has shown in paragraph 6.3.4. The ‘None’ question/statement/item in for instance Q06 can represent the whole question. In addition, if ‘None’ was marked as ‘Yes’, none of the others was marked ‘Yes’. Thus if the inverse of the ‘None’ question was used, then the ‘Yes’ would mean that the SME received support from external consultants and ‘No’ would mean the SME did not receive any external support.

These questions as previously indicated in this chapter are identified by a ‘n’ that was added at the end of the question name. These questions were then used in the log linear analysis as shown in Table 6.45.

Table 6.45: Variables that were taken up in the log linear analysis.

Question name	Categories	Frequency	Percentage
New1	SME has a structured risk management approach.	40	25.3%
	SME does not have a structured risk management approach.	118	74.7%
Q06_08n	SME received support from external consultants in one or more areas.	106	67.1%
	SME did not receive support from external consultants in one or more areas.	52	3.9%
Q07_1_1n	Business experienced financial problems in the past.	97	61.4%
	Business did not experience financial problems in the past.	61	38.6%
Q17_06n	Risk identification and assessment take place in one or more functions in the SME.	138	87.3%
	Risk identification and assessment do not take place in one or more functions in the SME.	20	12.7%
Q20_1n	Obstacles are experienced in implementing a risk management framework.	109	69.0%
	No obstacles are experienced in implementing a risk management framework.	49	31.0%

Due to the fact that 5 variables were used in the log linear analysis, the expected frequencies in the cells became too small and the variable that mostly contributed to this was Q17.06n. This variable was then omitted for this reason, as well as that there was no association between this variable and the dependent variable ‘new1’ when it was compared in a two-way table with a Chi-square test. As a result, four variables new1, q06_08n, q07_1_1n and q20_1n were used in the log linear analysis.

Table 6.46 shows all the models that were fitted and which one was the best fit.

Table 6.46: Results of the log linear analysis.

Nr	Model	DF	Likelihood Chi-square	P-values
1	New1	13	74.40	<0.0001
2	Q06_08n	13	92.61	<0.0001
3	Q07_1_1n	13	91.15	<0.0001
4	Q20_1n	13	88.88	<0.0001
5	New1 & q06_08n	12	59.21	<0.0001
6	Q06_08n & q07_1_1n	12	80.54	<0.0001
7	Q07_1_1n & q20_1n	12	77.05	<0.0001
8	Q20_1n & new1	12	55.10	<0.0001
9	New1 & q06_08n & q07_1_1n	11	49.10	<0.0001
10	Q06_08n & q07_1_1n & q20_1n	11	63.87	<0.0001
11	Q07_1_1n & q20_1n & new1	11	45.10	<0.0001
12	New1 & q06_08n & q07_1_1n & q20_1n	10	29.19	<0.0001
13	New1*q06_08n & main effects	11	59.20	<0.0001
14	New1*q07_1_1n & main effects	11	62.96	<0.0001
15	New1*q20_1n & main effects	11	44.27	<0.0001
16	Q06_08n*q07_1_1n & main effects	11	80.51	<0.0001
17	Q06_08n*q20_1n & main effects	11	65.96	<0.0001
18	Q07_1_1n*q20_1n & main effects	11	71.44	<0.0001
19	q06_08n*q07_1_1n q06_08n*q20_1n & main effects	8	22.19	0.0046
20	q07_1_1n*q20_1n q07_1_1n*new1 & main effects	8	19.44	0.0127
21	q20_1n*new1 q20_1n*q06_08n & main effects	8	9.54	0.2986
22	New1*q06_08n new1*q07_1_1n & main effects	8	28.03	0.0005
23	New1*q06_08n & new1*q07_1_1n & new1*q20_01n & main effects	7	18.50	0.0099
24	q06_08n*q07_1_1n & q06_08n*q20_1n & q06_08n*new1 & main effects	7	22.19	0.0024
25	q07_1_1n*q20_1n & q07_1_1n*new1 & q07_01_01n*q06_08n & main effects	7	19.18	0.0076
26	q20_1n*new1 & q20_1n*q06_08n & q20_1n*q07_1_1n & main effects	7	3.95	0.7850

Models number 21 and number 26 map to the data since the likelihood ratio test for the four-variable interactions and main effects are both non-significant at the 0,05 level of significance. To determine which model fits the data the best, the difference of the likelihood Chi-squares 9,54 -3,95 = 5.59 and the difference of the degrees of freedom 8 – 7 = 1 are calculated. Since the critical value for 1 degree of freedom at the 0,05 level of significance is 3,84, the difference is significant with the preferred model, model number 26. The percentage improvement in goodness of fit is (9,54 – 3,95)/9,54 = 0,58, therefore a 58% improvement.

The analysis of variances (refer to Table 6.47), shows that model number 26 fits, since the likelihood ratio test for the four-variable with 3, two variable interactions and main effects is non-significant at the 0,05 level of significance. The two-variable interactions however are significant, which shows that there is mutual dependence among these variables.

Table 6.47: Maximum likelihood (analysis of variance).

Source	DF	Chi-square	P-value
New1	1	16.88	<0.0001***
Q06_08n	1	6.27	0.0123*
Q07_1_1n	1	5.03	0.0249*
Q20_1n	1	1.44	0.2309
New1*q20_1n	1	10.68	0.0011**
Q06_08n*q20_1n	1	7.81	0.0052**
Q07_1_1n*q20_1n	1	5.51	0.0190**
Likelihood ratio	7	3.95	0.7850

Although the variable ‘experiencing of obstacles when implementing a RMF’ was associated with ‘whether a business has a structured risk management approach’, ‘whether a business had financial problems previously’ and ‘whether external support is given to the business’, it was not significant on its own in this model. The strongest association was between ‘whether a business has a structured risk management approach’ and ‘experiencing of obstacles when implementing a RMF’. From the two-way Chi-square tests the analogy can be drawn that the obstacles with the greatest effect, are the ‘lack of intellectual capital’, ‘cost’ and ‘lack of skills’.

The predicted frequencies as well as the actual frequencies can be seen in Appendix H with the final model being fitted.

6.4 DISCUSSIONS AND CONCLUSIONS

As for the results obtained through this survey, the following analogies can be drawn from the survey research:

- A fewer number of the smaller companies (smaller turnover, less employees and sole proprietorships), had a structured risk management approach.
- External support to management areas (specifically to marketing, human resources and public relation management), had an effect on whether a company had a structured or non-structured risk management approach.
- Companies that had a structured approach to risk management also had clearly defined strategies and objectives to help determine, which activities were critical for the survival of a business and had an understanding of the risk that had an impact on their business structure and processes. As a result, a structured approach to risk management had an impact on risk efficiency.
- Formal risk identification and assessment taking place at different areas within a company especially in finance, human resources and operations had an effect on the company with a structured or non-structured risk management approach.
- Improvement of internal controls and engagement of risk activities took place to a lesser extent in companies that did not have a structured risk management approach.
- Companies, which did not have a structured approach to risk management experienced obstacles to implementing a risk management framework. These obstacles especially related to a lack of intellectual capital, lack of skills and cost.

- An interesting point is that companies, which did have a structured risk management approach rated management risk and commercial risk, as the least important.
- The independent Chi-square tests provided empirical support that a non-structured risk management approach impacted adversely on risk efficiency.
- The log linear analysis showed the association between obstacles to implementing a risk management framework and external support, financial problems experienced previously and a non-structured risk management approach especially within the smaller companies (smaller turnover, less employees and sole proprietorships).

CHAPTER 7

FORMULATION OF A STRUCTURED RISK MANAGEMENT MODEL FOR SOUTH AFRICAN SMEs

SYNOPSIS

An SME risk architecture model is proposed to assist SMEs in effectively managing their risks. This model consists of the three interrelated components of SME risk consciousness, addressing specific focus areas, the SME risk management process, addressing the risk management process, and the SME risk management framework, addressing a holistic view of a structured risk approach. The emphasis on micro- and small enterprises is reiterated in the risk consciousness that focuses on the most critical risks observed and experienced by SMEs according to literature sources and surveys.

The SME risk management process, consisting of the subprocesses risk context and strategy, risk decisions, communication, and monitoring, review and continuous improvement, encompasses the complete process whereby risks are managed. The risk context and strategy process underpin all risk management activities and include the development of an understanding of the environment in which the SME operates, defining organisational and departmental objectives, and determining the resource requirements and risk criteria to be used.

Risks are identified, assessed, documented and acted upon in the risk decision phase, where the risk's effect on objectives is measured in terms of the impact of the risk as well as the probability that the risk can occur. This measurement enables SMEs to prioritise risk, thereby allocating scarce resources accordingly.

Effective communication underpins all activities and occurs throughout the entire risk management process, facilitating effective interactive communication between all organisational levels. To ensure the effectiveness of risk management actions, continuous monitoring and review actions are proposed. The monitoring and review actions also facilitate continuous improvement activities by adapting processes and focus areas to incorporate the changing business environment.

The last phase of the SME risk architecture model namely the SME risk management framework, provides guidance to SMEs on the process to plan structured risk management processes, implement the processes, and measure the effectiveness of the risk actions taken. This principle-based framework aims to facilitate the achievement of organisational objectives and supports organisational performance measurement by mapping performance measurement indicators to the risk management framework results and evaluating the effectiveness thereof.

The content of Chapter 7, along with the relative positioning of the topics, is graphically depicted in Figure 7.

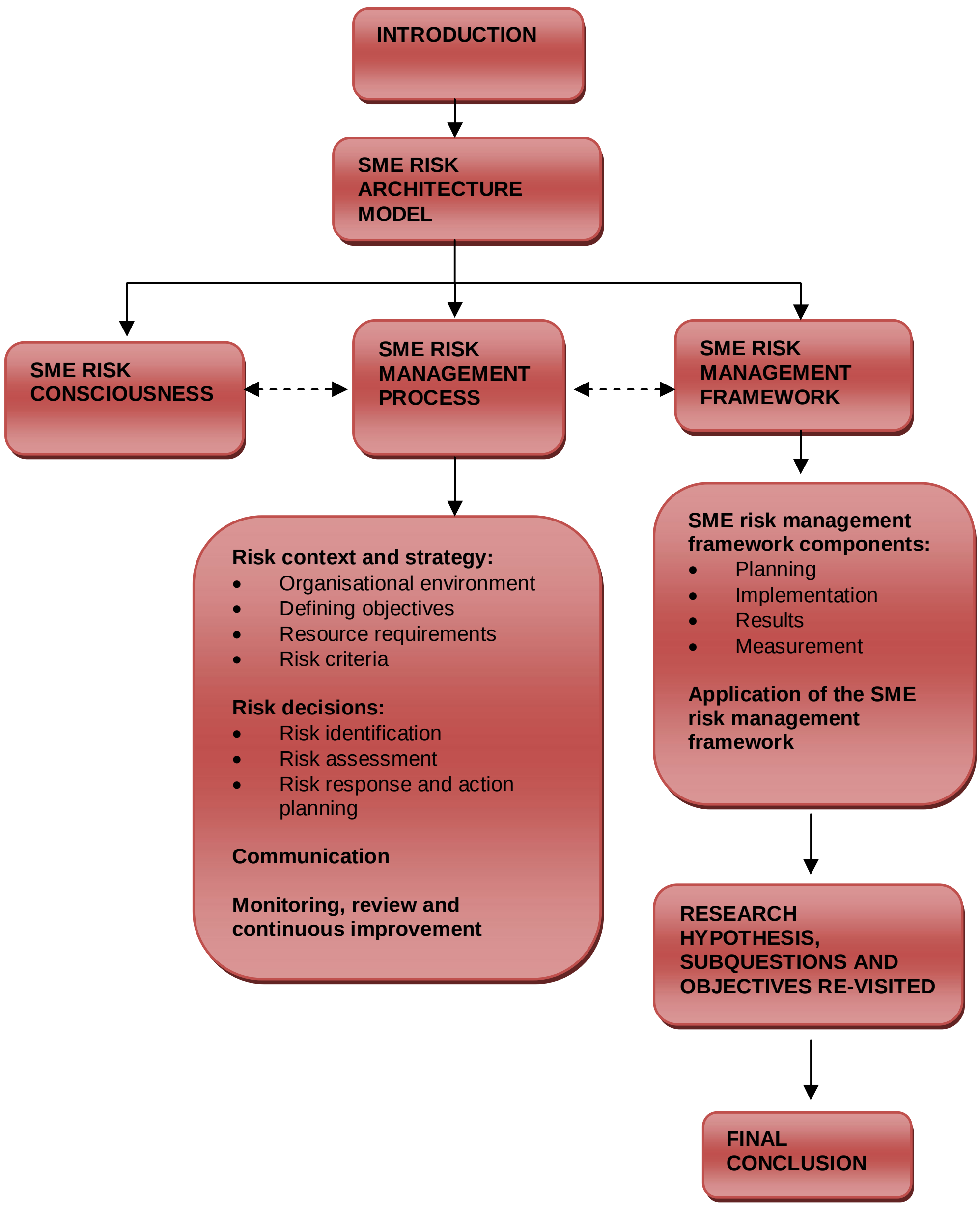


Figure 7: Detailed layout of Chapter 7 - Formulation of a structured risk management model for South African SMEs.

CHAPTER 7

FORMULATION OF A STRUCTURED RISK MANAGEMENT MODEL FOR SOUTH AFRICAN SMEs

7.1 INTRODUCTION

The analytical process followed thus far, is graphically depicted in Figure 7.1, which places the chapters in context with the overall thesis objectives, and furthermore indicates the relative positioning of this chapter.

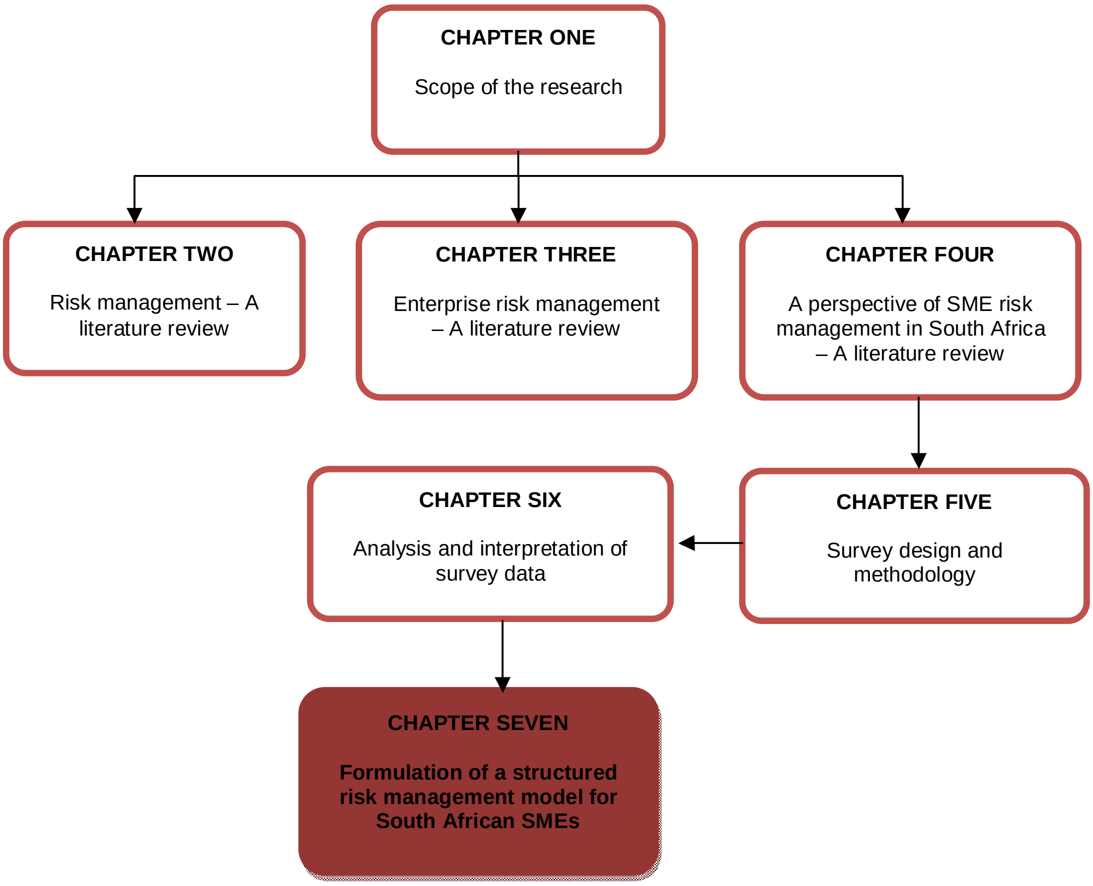


Figure 7.1: Chapter 7 - Formulation of a structured risk management model for South African SMEs' positioning.

Based on the literature review conducted in Chapters 2, 3 and 4 and the survey results analysed in Chapter 6, an SME risk architecture model is proposed to facilitate the effectiveness of risk management practices in South African SMEs within the retail sector.

7.2 SME RISK ARCHITECTURE MODEL

The proposed SME risk architecture model encompasses three interrelated phases namely:

- Phase 1: SME risk consciousness
- Phase 2: SME risk management process
- Phase 3: SME risk management framework.

These areas are depicted in Figure 7.2, thereby suggesting a structured approach to managing micro- and small business risks. By embedding a structured risk management approach, organisational benefits such as greater transparency, an increased risk awareness, a controlled risk environment, better allocation of capital and an improvement in the execution of the business plan can be achieved.

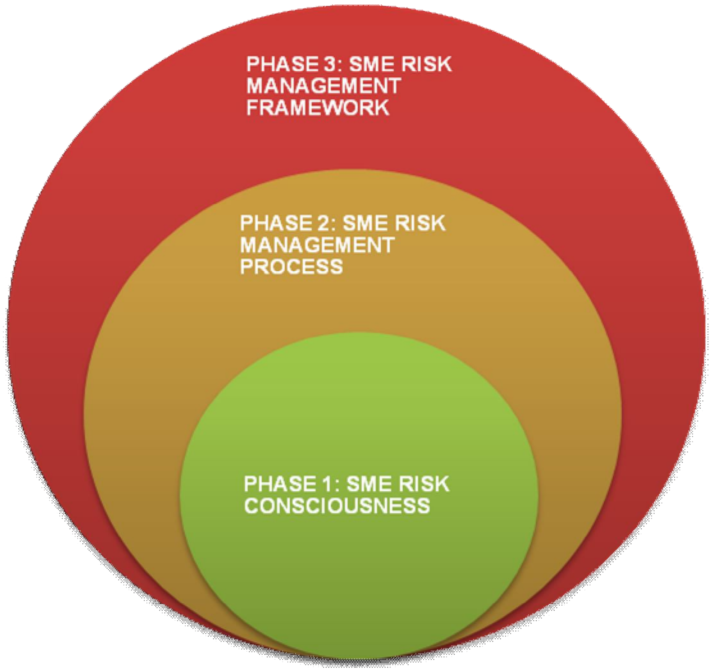


Figure 7.2: Holistic depiction of the SME risk architecture model.

A detailed discussion of the SME risk architecture elements follow in Paragraph 7.3, Paragraph 7.4 and Paragraph 7.5.

7.3 SME RISK CONSCIOUSNESS

The first element of the SME risk architecture model is defined as the SME Risk Consciousness (SRC). Refer to Figure 7.3 for a schematic depiction of the SRC. As opposed to the other generic risk architecture elements, namely SME risk management process and SME risk management framework, the SRC provides a focused approach on risk sources or risk areas most commonly identified[118] as actual or perceived obstacles to organisational success and survival as measured by the achievement of organisational objectives.

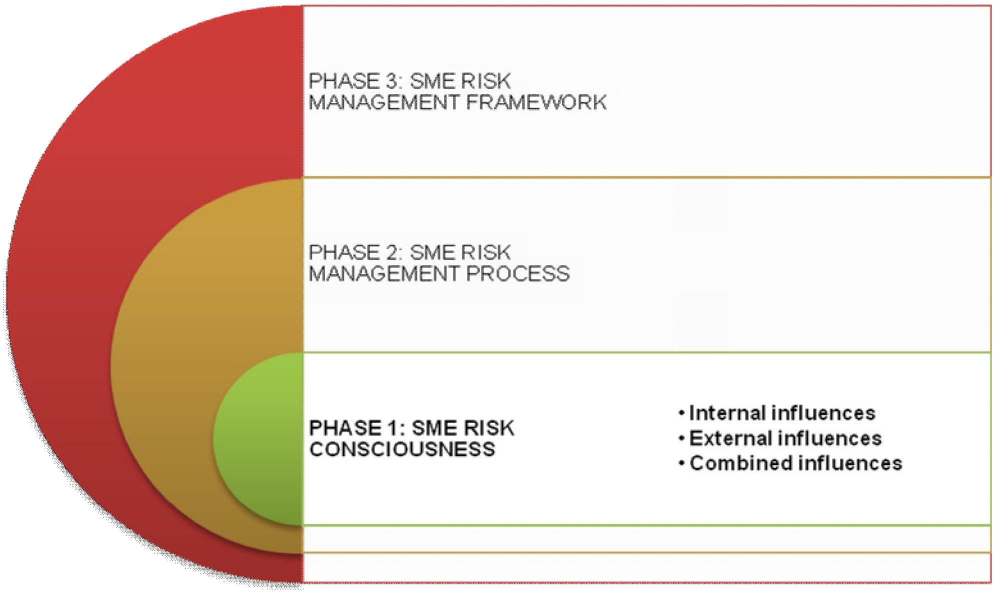


Figure 7.3: SME risk consciousnesses.

A combination of the measurement-driven approach and process control approach, hereafter termed the Measurement Process Approach, is proposed. SME owner-managers' attention is hereby directed to the most critical risks faced by the organisation taking cognisance of risk prioritisation, as well as the key business processes and uncertainties embedded in the execution of the business plan. Through the utilisation of

[118] Risk source / risk area identification was conducted through the mediums of extensive literature review and applied field research conducted by way of surveys on SME owner-managers in the retail sector, Western Cape, South Africa.

the Measurement Process Approach, the following risk focus points are identified that may impede on organisational performance and survival:

- **Internal risk areas**: The internal risk area is the internal organisational environment where risk elements are defined in the context of internal organisational objectives.
- **External risk areas**: The external risk area is the external environment where interaction occurs between stakeholders outside of the organisation and the organisation. External risk elements are defined in the context of external organisational objectives.
- **Combination of internal and external risk areas**: The risk elements in this category are neither exclusively internally nor externally driven and are influenced by both categories to a different extent.

The internal, external, and combined risk areas are subdivided into specific risk elements, either process-specific or area-specific, that are applicable to micro- and small enterprises. Furthermore, each process or area is prioritised according to its importance as perceived by SME owner-managers and literature sources depicted in Figure 7.4.

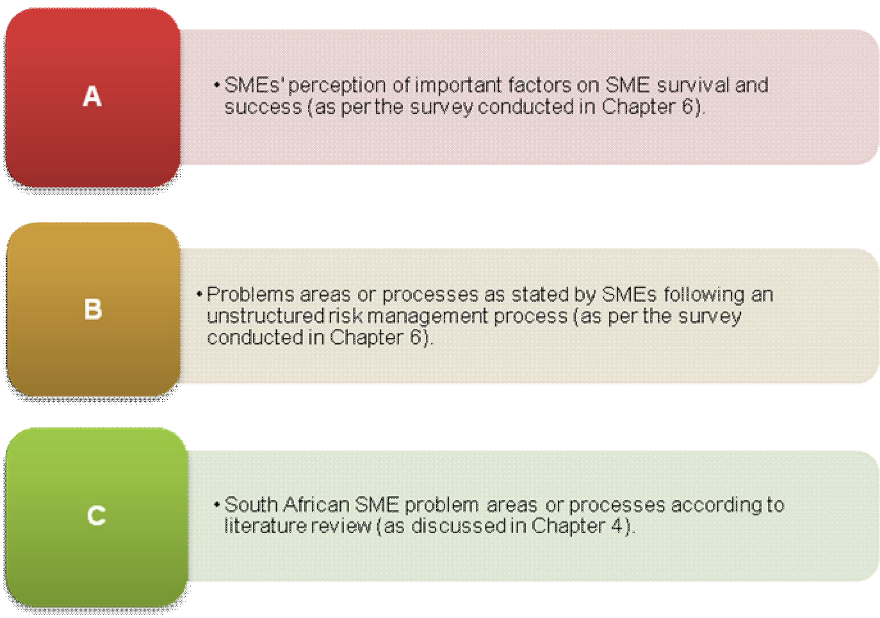


Figure 7.4: Areas or processes of importance.

- **Business processes/operational activities (importance A, B, C):** Business processes are defined as, a "… series of logically related activities or tasks performed together to produce a defined set of results" (Business Dictionary, 2010a:Online). This entails product quality, reduction of overspending, recruiting quality staff and other human resource processes, sales, marketing, and productivity.

- **Business continuity (importance A):** Business continuity is defined as, the "… ability of the key operations of a firm to continue without stoppage irrespective of the adverse circumstances or events" (Business Dictionary, 2010b:Online).

- **Finance (importance A, B, C):** Finance is defined as, "… a branch of economics concerned with resource allocation as well as resource management" (Investor Words, 2010:Online). This entails the availability of working capital, sales growth, sales level, debt load, interest cover, capacity for indebtness, and profitability.

- **Strategy including strategic objectives (importance B):** Strategy is defined as, the "… alternative chosen to make happen a desired future" (Business Dictionary, 2010c:Online). Strategic objectives are defined as, the "… broadly defined target that an organisation must achieve to make its strategy succeed" (Business Dictionary, 2010d:Online). Affecting strategy is the strategic risk of ineffective marketing strategies.

- **Managerial aspects (importance B, C):** This area encompasses multifunctional management, i.e. designated head for each of the business functions, managerial tools such as cash flow budgets, managerial training and qualification, skills, succession planning, and level of managerial commitment.

- **Security (importance A):** From the perspective of this author, security can be defined as, "… all actions taken to safeguard tangible and intangible assets". This entails physical security such as entrance control, safekeeping through, e.g. fencing off high value assets, as well as safeguarding organisational name and reputation.

- **Learning & growth (importance B, C):** Learning and growth can be defined as, "… the measurement of intangible assets such as human capital, information and process systems, and cultural attributes necessary to produce the value proposition products and/or services" (Business News and Concepts, 2010:Online). It is about the sustainability of the organisation and the human ability to change, adapt and improve. Learning and growth encompass intellectual capital; the age, training and experience of the entrepreneur as well as employees.

- **Reputation (importance B):** Reputation can be defined as, the "… overall estimation of the character or quality…" with regard to an organisation and organisational management, as held by stakeholders and the public (Business Dictionary, 2010e:Online). Reputation extends into public relations which is defined as, the "… systematic effort to create and maintain goodwill of an organisation's various publics (customers, employees, etc.) usually through publicity and other non-paid forms of communications" (Business Dictionary, 2010f:Online).

- **Information (importance C):** From the perspective of this author, information can be defined as, "… raw data that has been verified to be accurate and timely, is specifically organised for a purpose, is presented within a content that gives it meaning and relevance, and which leads to an increase in understanding and decrease in uncertainty" (Business Dictionary, 2010g:Online). The value of information lies solely in its ability to affect a behaviour, decision or outcome.

- **Industry (importance C):** Industry can be defined as, "… the aggregate of manufacturing or technically productive enterprises in a particular field, often named after its principle product" (Dictionary Reference, 2010a:Online). For SMEs, 'industry' refers to the competitive position of the company, competitors' reaction, and demand fluctuations.

- **Economy (importance C):** Economy in the context of SME interactions with all stakeholders can be defined as, "… the system of production and distribution and consumption" (Princeton, 2010a:Online). For SMEs, 'economy' refers to employment opportunities, crime, exchange rate, and interest rate.

- **Legislation & insurance (importance C):** Legislation refers to "… the law enacted by a legislative body" (Princeton, 2010b:Online). This includes employment legislation, environmental, health and safety legislation, trade legislation, etc. Insurance can be defined as, "… the act, system, or business of insuring property, life, one's person, etc., against loss or harm arising in specific contingencies …. in consideration of a payment proportionate to the risk involved" (Insurance, 2010:Online). Insurance against theft and fire is some of the more general aspects SMEs should consider.

- **Technological aspects (importance C):** Technology can be defined as, "… the branch of knowledge that deals with the creation and use of technical means and their interrelation with life, society, and the environment, drawing upon such subjects as industrial art, engineering, applied science and pure science" (Dictionary Reference, 2010b:Online). This could refer to suppliers, equipment, development and research, and continuous improvement.

The process of directing the organisational risk focus to the abovementioned risk elements, is schematically depicted in Figure 7.5.

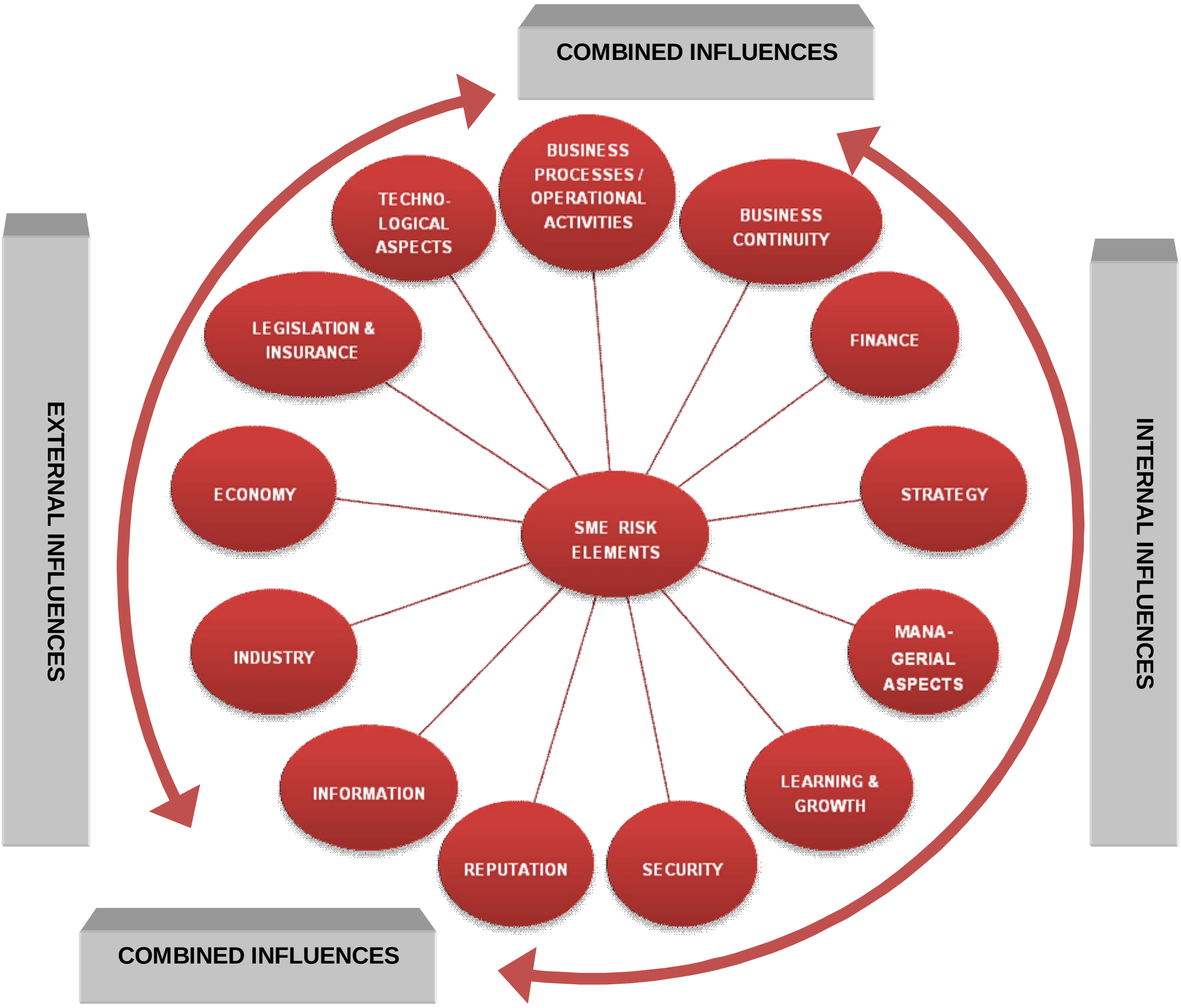


Figure 7.5: SME risk elements.

By directing the organisational risk focus, SME owner-managers can improve the effectiveness of their risk management process through focussing on the most frequent risks encountered by SMEs. However, this risk element model does not diminish the important role of owner-managers in the SME risk consciousness phase, as SME owner-managers are still required to evaluate the merit of each risk element as applicable to their organisational objectives. If other internal or external risks influence organisational processes or activities, these should be included in the organisational risk focus. Furthermore, SME owner-managers should take cognisance of the interdependency of risks as well as the cumulative effect of risk whereby seemingly insignificant risks, if not addressed, escalate into significant risks.

The risk elements identified in the SME risk consciousness phase are escalated into the SME risk management phase where action is taken in addressing the risks these elements pose to organisational activities and processes.

7.4 SME RISK MANAGEMENT PROCESS

The Risk Management Process (RMP) constitutes the steps SME owner-managers should follow in addressing risk elements (as discussed in Paragraph 7.3) that impede/can impede on organisational objectives. The RMP consists of numerous organisational risk-driven activities, that are grouped into four processes as depicted in Figure 7.6.

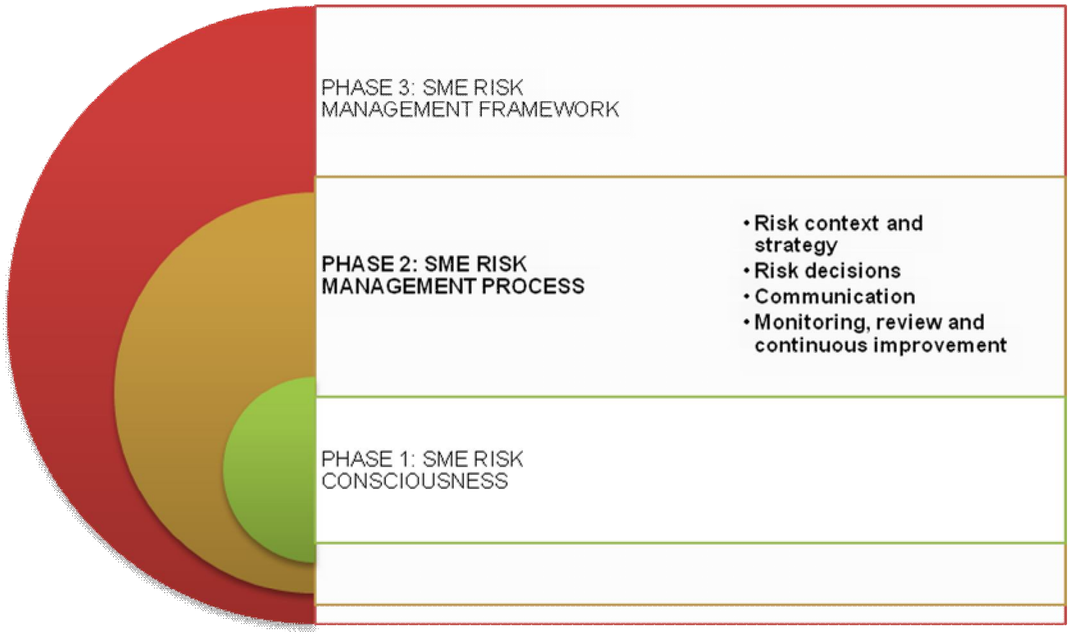


Figure 7.6: The SME risk management process.

7.4.1 Risk context and strategy

The risk context and strategy platform underpin all organisational risk management activities and consist of four fundamental activities. Figure 7.7 represents a schematical depiction of the risk context and strategy activities.

Figure 7.7: Risk context and strategy subprocesses.

7.4.1.1 Organisational environment

The 'organisational environment' can also be termed the 'risk environment', and encompasses the internal and external environment in which the organisation operates, setting the parameters within which risks are managed. SME executive management, the risk task team or designated parties should develop an understanding of the organisational environment through:

- ➢ Identifying and assessing the internal environment factors by utilising managerial techniques such as brainstorming, forums, etc.
- ➢ The internal environment, which concerns all factors influencing the manner in which organisations manage risk, includes but are not limited to the following:
  - o Organisational processes, structures and roles.

- Standards, guidelines, policies, procedures, frameworks and models used by the organisation.
- Organisational culture including ethical values and management's operating style.

➢ Documenting their understanding of the internal environment using the organisational business information system.

➢ Identifying and assessing the external environmental factors through e.g. industry discussions, applied research, etc.

➢ The external environment, which concerns the expectations/requirements of external stakeholders that should be complied with, e.g.:
- Legal and regulatory requirements.
- Social, cultural, economical, competitive, and technological environment.
- Stakeholder expectations (e.g. suppliers, clients, etc.).

➢ Documenting their understanding of the external environment by using the organisational business information system.

7.4.1.2 Defining objectives

Organisational processes and risk management activities are underpinned by the following key elements which should be defined and documented by executive management, the risk task team or the designated party:

➢ **Organisational focus:** Organisational focus encompasses organisational objectives and strategy determined in the planning phase, as discussed in the SME risk management framework (refer to Paragraph 7.5.1.1). These objectives are cascaded downward into departmental/functional objectives. The risk elements discussed in the SRC phase may be used to guide owner-managers in determining functional processes (and setting functional objectives) that need to be managed.

➢ **Risk management focus:** The risk management focus consists of the following activities:

- To determine the positioning of the risk management function within the organisation.
- To define the objectives and methodology of the risk management process. Consideration should be given to the inclusion of risk knowledge in organisational decision-making.
- To determine how positive risks can be channelled back to strategy and objectives.
- To determine the scope of the risk management process including specific process/area inclusions and exclusions.
- To determine risk management leadership. Responsibility and accountability for the risk management process should be defined, including risk reporting lines.
- To determine how the effectiveness of the risk management process can be assessed.

7.4.1.3 Resource requirements

Based on the scope of the risk management process, SME executive management, the risk task team or designated party should determine and document the risk management process resource requirements by considering the following:

- Personnel availability and know-how.
- Time requirements in terms of scheduling risk meetings/workshops (risk planning, action, and feedback workshops/meetings).
- Information system requirements in identifying risks, implementing controls, reporting of deviations and follow-up activities.
- Risk communication mechanism, e.g. informal discussions, company newsletter, etc.
- Technology requirements, e.g. use of spreadsheets to support risk management activities, and/or the compiling of an organisational risk profile.
- The use of risk registers to capture risk data and action, as well as the format of the risk registers.

7.4.1.4 Risk criteria

SME executive management, the risk task team or the designated party should define and document the risk criteria to be used in assessing risk. The risk criteria will include:

- Type of risks that impede/may impede on organisational objectives.
- Affirming that risk consists of both positive and negative uncertainties that might influence the achievement of objectives.
- The risk measurement criteria to be used, e.g. a classification system of ‘High/Medium/Low’ to be used, or numbers ranging from 1 to 10, with 1 as ‘extremely rare/negligible’ risks and 10 as ‘almost certain/catastrophic’ risks.
- Defining risk materiality, i.e. defining when risk is important.
- Risk timeframe applicable to risk impact and risk probability, i.e. when is risk expected to occur, e.g. next month, next year, etc.
- Risk terminology clarification, i.e. use of terms such as impact/consequence/effect and probability/likelihood/frequency.
- The level of acceptable risk, i.e. the risk tolerance level of the organisation, which will be used to direct the flow of organisational resources.
- The use of a simplex or complex risk view, i.e. should risks be viewed in isolation or should multiple risks or combination risks be considered.

7.4.2 Risk decisions

The fundamental principles defined in the risk context and strategy process are extrapolated into the risk decision process where risk actions are taken to address uncertainty, which impacts on organisational objectives. The risk decision process consists of the subprocesses of risk identification, risk analysis, risk evaluation, risk response and action planning as depicted in Figure 7.8.

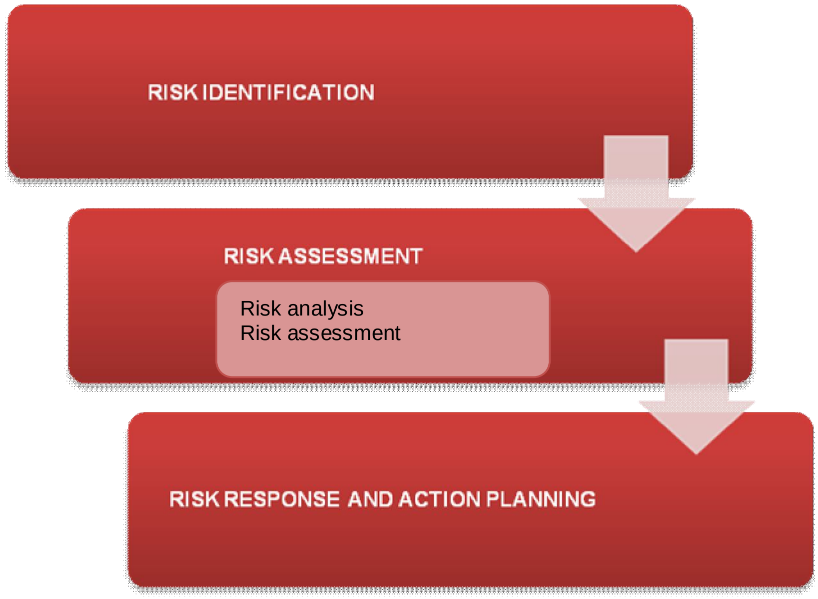


Figure 7.8: The risk decision process.

7.4.2.1 Risk identification

In the risk identification process, risk problem structuring occurs along with the creation of organisational risk information through the development of a historic risk database, based on realised risks, and a risk register that formalises the anticipated current and future risks. A thoroughly planned, well-executed risk identification process is of pivotal importance, as unidentified risks may escalate into unmanageable risks with unmanageable risk consequences.

The executive management, risk task team or designated party is tasked with the following activities during the risk identification process:

Risk environment and risk effect: All risks should be identified in the internal, external or combined environment regardless of whether the source of the risk is under the control of the organisation. Macro and micro risk identification should occur whereby significant/main risk sources and the subsources of risks within these main risk areas are identified. The identification of the risk effect, i.e. the risk's impact on other organisational areas, processes and risks, should be considered.

Risk approach: The ultimate responsibility for risk identification will most likely be the owner-manager as he/she has a comprehensive knowledge of all of the organisational processes and activities. It is important that the risk identification process follows a dualistic approach, whereby a strategic top-down approach as well as a bottom-up approach to risk identification is taken. This entails managerial involvement whereby management is concerned with strategic risk identification and lower level employees contribute towards the identification process by identifying process/activity ground-level risks they experience or anticipate through employing managerial techniques such as questionnaires, workshops and the use of Control Self Assessments (CSA). A key element in the success of the dualistic risk identification approach is based on an effective interface between the top/bottom approach whereby all risk information is assimilated and risks gaps identified, i.e. risks areas not addressed.

Develop risk information database: The information database should consist of historic risk information and current and future risk information.

- **Historic risk identification:**
  - **Develop a risk history database:** A risk history database (see Table 7.1), is a database which should be used by management to assess possible risks when forecasting future projects.
  - **Information gathering:** Information can be gathered by way of an analysis of past events by a panel of experts, e.g. owner-managers, senior managers and employees with a thorough organisational knowledge.
  - **Risk history database composition:** Historically realised risk events, including opportunities, are captured in a risk history database specifying:
    - **Risk source:** Classify the risk source with reference to the risk elements defined by management.
    - **Risk description:** A description of the realised risk event.
    - **Primary area:** The area(s) directly impacted by the risk.
    - **Secondary area:** The area(s) indirectly impacted by the risk.

- **Risk impact:** The effect/impact of the realised event on organisational activities/processes.
- **Risk severity:** Quantification of the risk impact.
- **Control failure:** A description of the preventative control failure (if any controls in place).
- **Risk detection:** The method by which the risk is detected.
- **Risk response:** The actions taken in response to the risk.

An example of a risk history database is depicted in Table 7.1.

Table 7.1: An example of a risk history database.

Risk history database extract: January 2009 – December 2009

RISK SOURCE	RISK DESCRIPTION	PRIMARY AREA	SECON-DARY AREA	RISK IMPACT	RISK SEVERITY	CONTROL FAILURE	RISK DETECTION	RISK RESPONSE
Internal: security	Theft of stock – 5 Dell notebooks	Finance	Organisational climate – employee moral	Affect store sales, performance bonus payouts	High – loss R25000	Store room not locked	Monthly inventory count	Store room locked, key register implemented
Combined: reputation	9 defective Ipods sold	Reputation	Finance, legislation	Customer goodwill jeopardised, cashflow affected due to legislative action taken against manufacturer	High – loss of goodwill not quantifiable. Legal cost: R50 000.	No quality checks upon receiving inventory	Client complaints, product returns	Quality inspection certificate required from manufacturer before acceptance of goods

Fictitious data, for illustration purposes only

- **Present and future risk identification:**
  - **Develop a risk register:** A risk register should be used by management to monitor current and anticipated future risks that may influence the achievement of objectives.
  - **Information quality:** Attention is directed to the quality of information as good quality information is fundamental in the development of a risk register, identifying all possible risks and opportunities.
  - **Managerial techniques:** A management technique that can be used in identifying opportunities and threats is a SWOT (**S**trength, **W**eakness, **O**pportunity, **T**hreat) analysis. Information gathering/evaluating sessions on current and future

operations, activities, etc. can be executed by various methods, e.g. workshops, scenario analysis, industry benchmarking, industry survey, judgements from the project team or management.

- o **Risk register composition:** The risk and opportunity information gathered should be used to populate a risk register (refer to Table 7.2).

Table 7.2: An example of a risk register – level 1.

Risk register extract: updated December 2010

RISK SOURCE	RISK DESCRIPTION	AFFECTED AREA	RISK DRIVER	RISK CHARACTER	OBJECTIVE/ CSF
Internal: business process	Unauthorised/ excessive discount given	Sales	Unethical staff / insufficient supervision	Delay	Total sales to grow by 9% per year
Combined: business continuity	Business standstill due to electricity shortages	Sales/ procure-ment/ finance	Powercuts by electricity provider / no UPS for business	Obstruct	Efficient service delivery / effective organisational processes

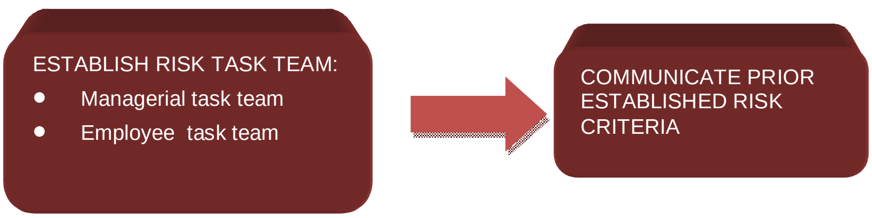
Fictitious data, for illustration purposes only

A risk register should reflect the following:

- **Risk source:** Classify the risk source with reference to the risk elements defined by management.
- **Risk description:** A description of the potential risk event.
- **Affected area:** The primary organisational area where the risk may occur.
- **Risk driver:** A description of the possible event that creates/drives the risk.
- **Risk characteristic:** The effect of the risk on organisational objectives or the Critical Success Factors (CSF) that drive the achievement of objectives. Classification can be made accordingly to (a) ***create*** opportunities for achieving objectives; (b) ***enhance*** the achievement of objectives; (c) ***delay*** the achievement of objectives; and (d) ***obstruct*** the achievement of objectives.

- **Objective or CSF:** The objective or CSF that may be affected by the risk/opportunity.

It is important that the risk identification process should be carried out on a continuous basis as the risk environment changes constantly. The register should at all times reflect the current anticipated risks in organisational activities, thus new risks should be added continuously and risks judged not relevant, should be removed from the register. The continuous risk identification process facilitates organisational risk awareness guiding SME owner-managers in their decision-making processes. The risk identification process flow is schematically depicted in Figure 7.9.



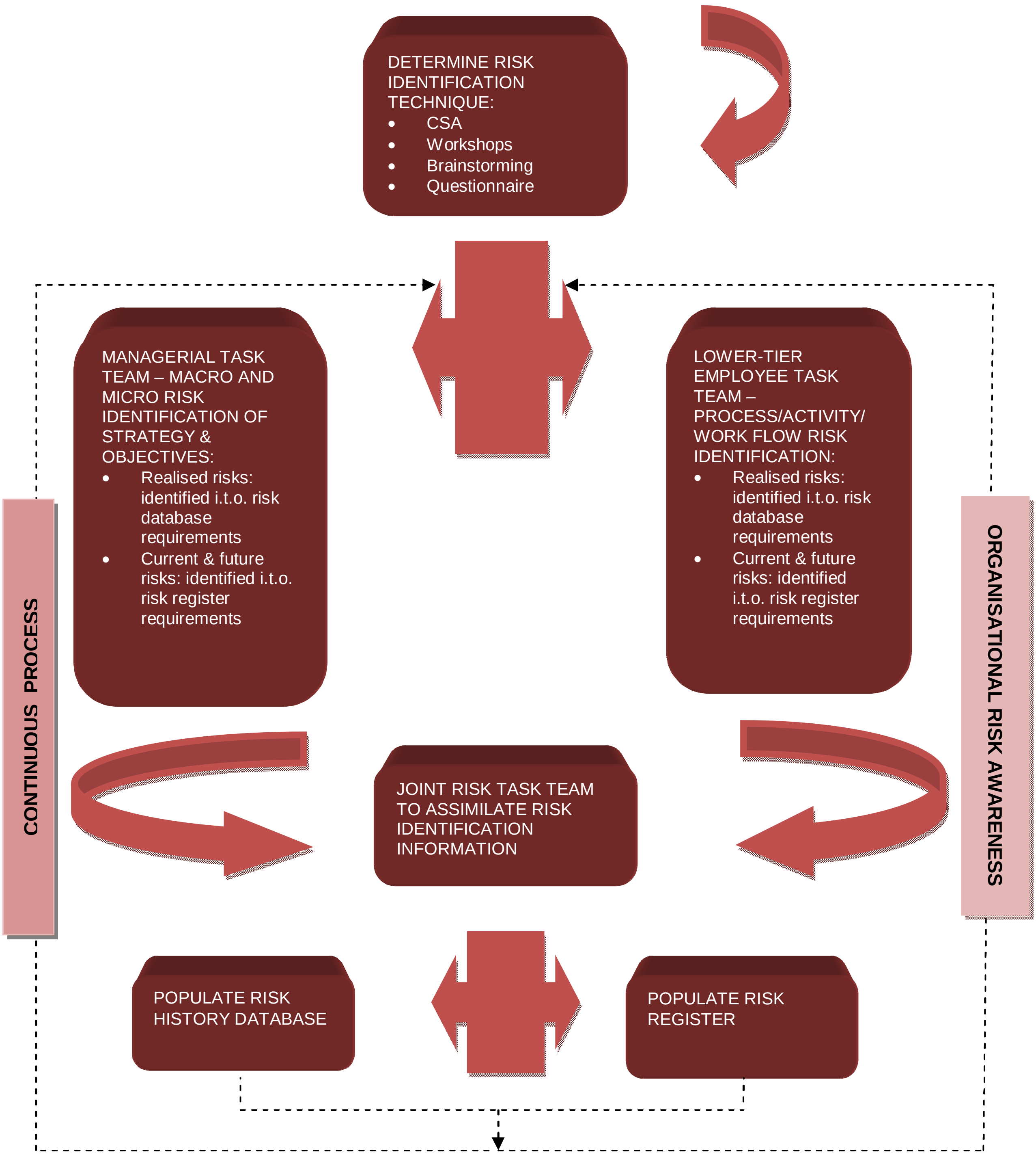


Figure 7.9: Risk identification process flow.

7.4.2.2 Risk assessment

Risk information gathered in the risk identification process is extrapolated into the risk assessment processes as depicted in Figure 7.10, consisting of risk analysis, risk evaluation and risk prioritisation.

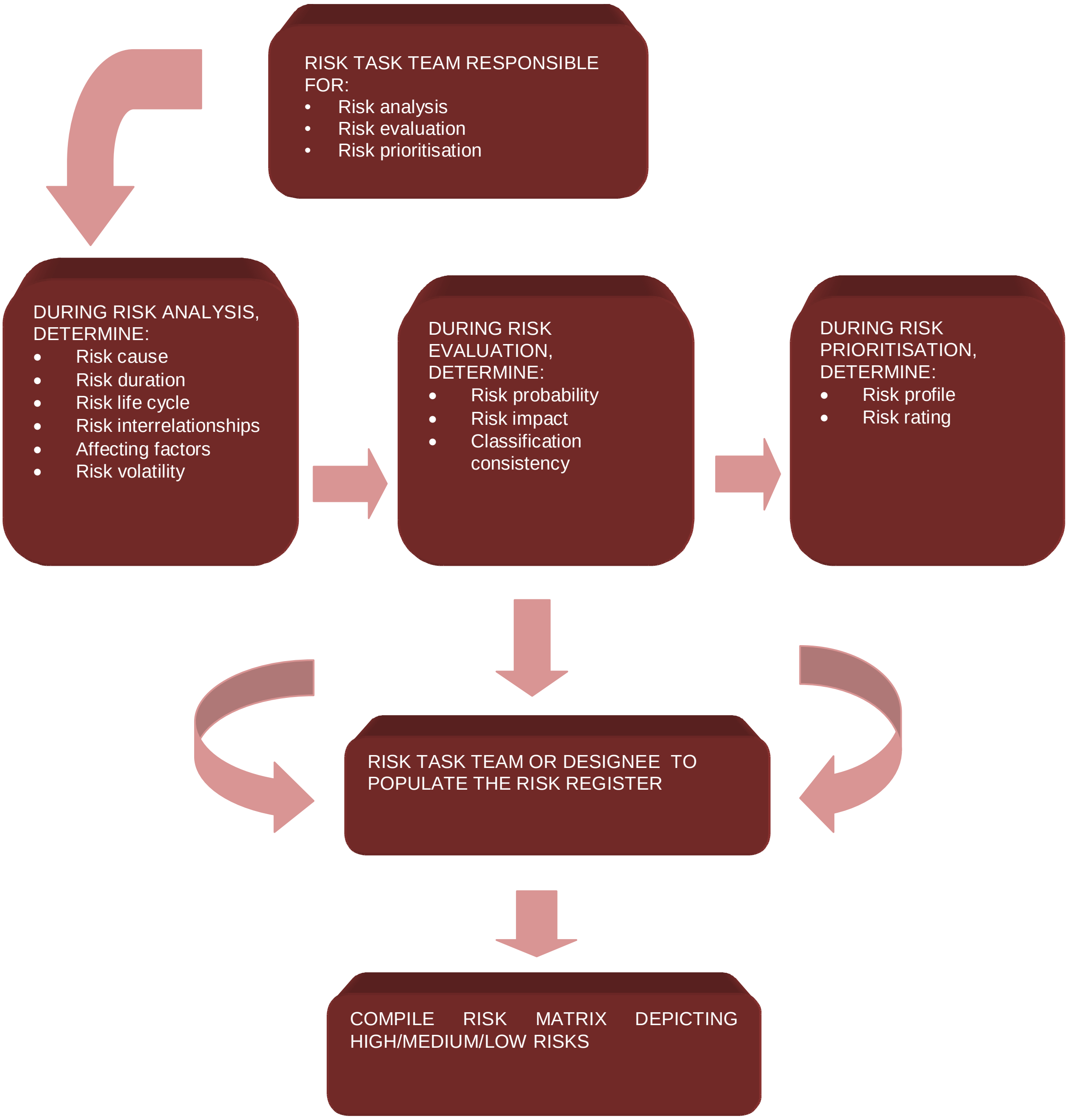


Figure 7.10: The risk assessment process.

Taking cognisance of data availability for SMEs and the quality of SMEs' information systems, a qualitative risk analysis and assessment technique are proposed to be executed by executive management, the risk task team or designated party.

- **Risk analysis:** The risk analysis subprocess is critical in the information flow of the risk management process, as it provides input for decision-making in the risk evaluation and risk treatment process. The risk characteristics should be analysed through brainstorming, personal and corporate experience, or any other appropriate technique, by determining:
  - **Risk cause:** The cause of the risk**.**
  - **Risk duration:** E.g. business disruption for 3 days.
  - **Risk life cycle:** The risk consistency.
  - **Risk interrelationships:** The positive and negative consequences if the risk is realised, considering the interrelationships of the risk.
  - **Affecting risk factors:** The factors that may affect the risk consequence and/or the risk possibility.
  - **Risk volatility:** The risk's sensitivity to assumption. Refer to Table 7.3 for an example of a risk volatility calculation.

Table 7.3: Risk volatility calculation

Assumption sensitivity rating (ASR) scale:			Volatility classification (VC) scale:	
1	High		High	Range 18 – 27
2	Medium		Medium	Range 6 – 12
3	Low		Low	Range 1 - 4

Risk A (consisting of three assumptions before realisation):
ASR 1 (assumption A) x ASR 2 (assumption B) x ASR 1 (assumption C) = <u>VC 2</u>

Conclusion:
The realisation of risk A can be predicted with relative certainty.

- **Risk evaluation:** The SME risk evaluation process should consist of the following activities:
  - **Probability:** The probability (also termed likelihood or frequency) of the risk occurring. The probability rating is reflected in the risk volatility rating value.

- o **Impact:** Determine the impact (also termed 'effect' or 'severity' or 'consequence'), the risk will have on the organisation as well as all stakeholders. The monetary amount of the loss as well as the duration of the risk (as determined in the risk analysis process) will significantly influence the severity of the risk, as large monetary losses over a short period of time are more difficult to manage compared to losses spread over a longer time period.
- o **Classification consistency:** The risk classification system used for measuring risk probability and risk impact should be consistent, i.e. if 'High/Medium/Low' is used to classify probability, the same rating scale should be applicable for measuring risk impact.

➢ **Risk prioritisation:** The risk prioritisation process enables SMEs to direct their focus and risk treatment resources. The SMEs' risk focus is therefore determined by the degree of disruption caused by the risk, considering amongst others, the organisation's risk appetite, legal implications and exposures, the organisation's capacity for enduring losses, social and reputational implications. In the risk prioritisation stage, the following should be considered:

- o **Risk rating:** Determine the risk score by multiplying the probability with the impact rating. This rating will be used to prioritise the risk according to risk importance.
- o **Establishing SME risk profile:** Based on the risk score, risks should be grouped into risk categories as determined in the risk classification stage, e.g. high probability / high impact, high probability / low impact, etc. Strategies will be devised in addressing these risks in the risk response stage based not only on the risk grouping, but also on the number of resources needed to manage the risk.

➢ **Risk assessment output:** A graphical depiction of the risk assessment process, highlighting areas of high, medium and low importance should be compiled. SME risk focus should be directed at the risks as categorised according to the risk character, to facilitate in the allocation of scarce resources, i.e. all risks obstructing the achievement of goals, or CSF should be grouped in one risk register. For example: level 2 risk register – risks obstructing the achievement of objectives; level 3 risk register - risks delaying the achievement of objectives; level 4 risk register – risks enhancing the achievement of objectives; and level 5 risk register – risks creating organisational opportunities. Refer to Table 7.4 for an example of a risk register that depicts the risk assessment process results.

Table 7.4: Risk register – level 2.

RISK REGISTER LEVEL 2 - UPDATED DECEMBER 2010

Risk number	Risk description	VC (*)	Probability (P) (H/M/L)	Impact(I) (H/M/L)	Risk score (P x I)	Risk priority	Control (**)	Control rating (***)	Residual risk (****)
1	Business standstill due to electricity shortages	Low	Low	High	Medium	1	None	3	Medium

* Refer to volatility classification calculation

** Refer to existing internal controls

*** Refer to effectiveness of internal controls

**** Refer to remaining risk after control action has been taken

RISK REGISTER KEY:

Probability (P)

Scale	Description
High – 3	Very likely
Medium – 2	Likely
Low – 1	Unlikely

Impact (I)

Scale	Description
High – 3	Severe risk effect
Medium – 2	Moderate risk effect
Low – 1	Minor risk effect

Risk score

Scale	Description
High (6 – 9)	High risk area requiring immediate attention
Medium (3 - 4)	Medium risk area requiring attention
Low (1 – 2	Low risk area, monitoring will suffice

Control rating

Scale	Description
1	Effective
2	Partially effective
3	Ineffective

VOLATILITY CLASSIFICATION CALCULATION (VC)

Risk number per risk register level 2	Assumption 1	ASR1	Assumption 2	ASR2	Assumption 3	ASR3	Assumption 4	ASR4	VC (ASR1xASR2xASR3ASR4)	Rating
(1)	High electricity demand	2	Ppower station not operating at full capacity	1	Other electricity providers unable to meet demand	2	-	-	Low	

VOLATILITY CLASSIFICATION CALCULATION TABLE KEY:

Assumption sensitivity rating (ASR)

Scale	Description
1	High
2	Medium
3	Low

Volatility classification (VC)

Scale	Range
High	18 – 24
Medium	6 – 12
Low	1 - 4

7.4.2.3 Risk response and action planning

Risk response decisions consist of the process in terms of which options to modify (or accept) risks are developed and implemented through risk action plans by the risk task team and/or line management, with the support of executive management. The following risk response and action planning steps are proposed:

- **Identify risk treatment options:** The risk treatment options available for selection should be determined. Risk treatment techniques can be categorised as 'operational' techniques and 'finance' techniques.
  - 'Operational' techniques alter the risk exposure and consist of:
    - **Risk avoidance:** The organisation does not engage in the activity/process, and terminates all relations with stakeholders who engage in this activity. Risk avoidance is impractical except in addressing catastrophic events.
    - **Risk mitigation:** Controls are introduced, which reduce the probability of the risk occurring and/or the risk consequences. The type of controls that may be embedded in such processes are (a) preventative controls, (b) detective controls, and (c) corrective controls.
    - **Risk retention:** Accepting the risk consequences based on the risk priority rating, e.g. extremely low probability, negligible impact, based on the parameters set by the risk tolerance.
    - **Risk transfer:** The risk exposure is transferred through the use of subcontractors, outsourcing, etc.
    - **Risk enhancement:** The risk may be increased to optimise an opportunity.
  - Risk 'financing' techniques provide funding for losses, reduce the risk consequences and consist of:
    - **Internal funds:** Reserves, provisions, etc.

- **Combined funding:** A combination of internal and external funds, e.g. a reduction in insurance premium is offered if the insured agrees to an excess payment.
- **Transfer funding:** The risk is transferred to a third party, e.g. commercial insurance.

➢ **Evaluate risk treatment options:** The appropriate responses to identified risks are developed, consisting of the following activities:

- **Evaluation of existing control mechanism**
  - Determine the efficiency and appropriateness of existing internal controls.
  - Determine whether the controls (a) eliminate, (b) reduce, (c) delay, or (d) detect the risk.
  - Rate the control's effectiveness using a control rating.
  - If internal controls are effective and the residual risk is at an acceptable level, risk monitoring actions will suffice.
- **Risk justification**
  - Compare the cost of addressing the risks with the anticipated benefit of controlling the risk. The cost should not outweigh the potential benefit.
  - Take cognisance of the risk's effect on legal requirements, social expectations, market implications, etc.
  - Take cognisance of the risk tolerance of the organisation, i.e. the level of risk the organisation is willing to accept before resources are expended in addressing risk.
- **Risk response**
  - Select the appropriate risk treatment per risk identified. The risk response option selected can be applied individually or a combination of treatment options can be used.
  - Determine if new risks are created by the risk treatment option selected. Manage the new risk as part of the original risk.

- **Residual risk and control risk: Residual risk** is the risk remaining after risk response actions have been taken. In addressing residual risk, management should:
  - Evaluate the residual risk level and determine if it is within the risk tolerance limit.
  - Implement new risk treatment options if the residual risk level is above the acceptable threshold.
  - Review the new treatment options and evaluate if the residual risk is within the risk tolerance range. Continue with this process until the level of risk is acceptable.

  Control risk is the risk which arise should risk controls fail. Management/the risk task team should:
  - Continuously monitor controls to determine their effectiveness.

- **Prepare and implement risk action plan:**
  - **Reactor:** Identify and document the individual or group responsible for the ownership of the risk.
  - **Risk response and residual risk:** Document the risk response and residual risk as determined in the preceding subprocess.
  - **Risk response priority and timing:** Determine and document the priority in which risk responses should be implemented. One should be guided by the risk priority as determined in the risk assessment process, as well as the anticipated timing of the risks, i.e. risks that are expected to occur first, should be treated before addressing risks that might realise at a later stage.
  - **Risk follow-up:** A responsible individual or group must be assigned the responsibility to following up and report on the risk response actions.
  - **Execute risk actions:** Execute risk response according to risk priority.

The proposed risk response and action planning process are schematically depicted in Figure 7.11.

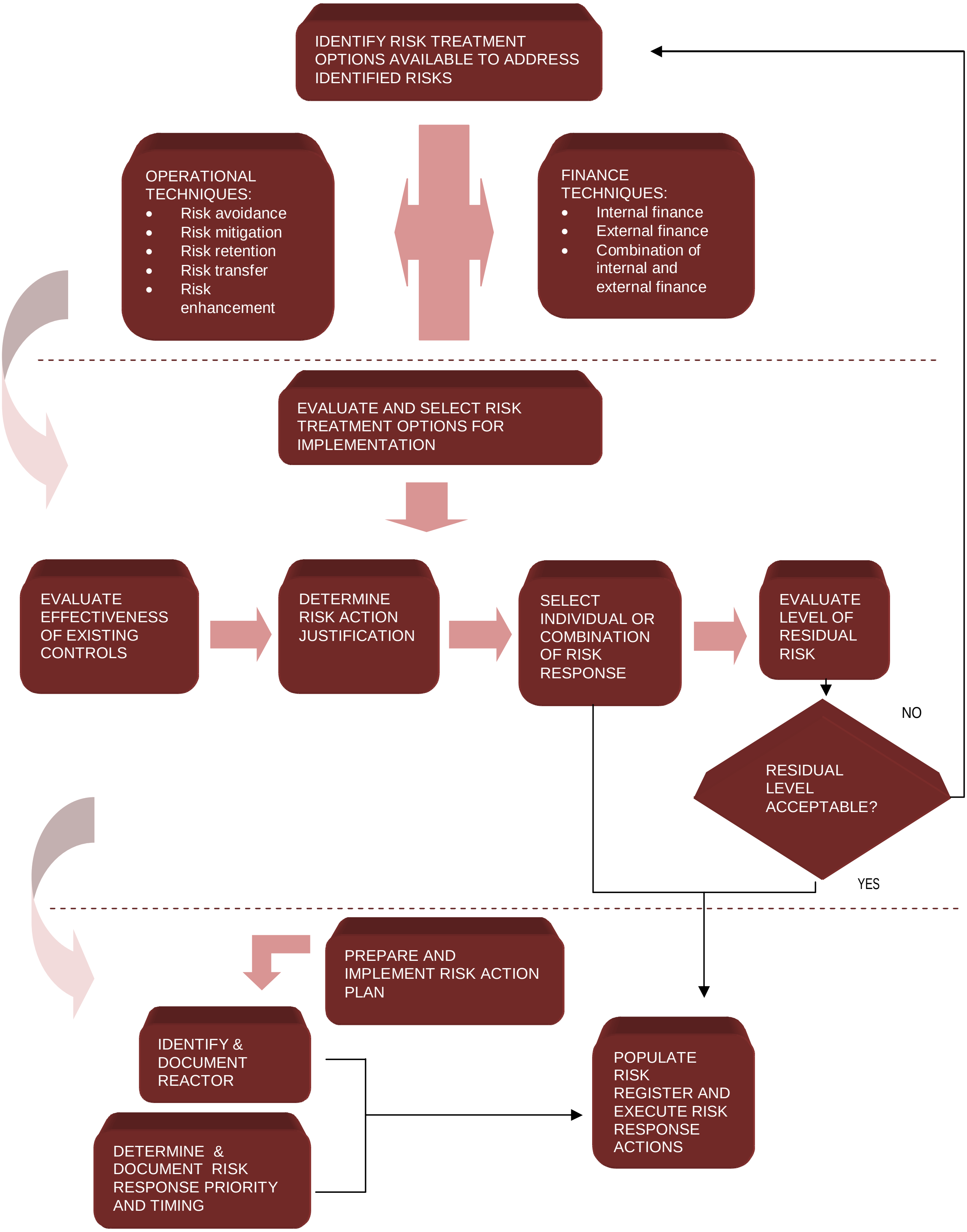


Figure 7.11: Schematic depiction of risk response and action planning process.

In the SME risk management process (refer to Figure 7.6), the communication subprocess is depicted as a separate activity that must be undertaken in managing organisational risk. This subprocess of communication is however embedded in all risk management activities, and is pivotal in assuring risk accountability and ownership. It is proposed that the following actions with respect to communication be undertaken by executive management, the risk task team or designated party:

- **Develop an internal and external communication and consultation plan**.

  The internal communication and consultation plan should comprise of the following activities:

  - Establish a communication process for interactive (two-way) consultation with internal stakeholders, e.g. monthly risk forums discussing risks, risk factors, risk effects and risk treatment options.
  - Establish a reporting structure, whereby risk information derived from the risk management process, is communicated timeously to appropriate parties. This include key elements of the risk management framework, as well as any modifications made to the framework.
  - Establish a reporting structure whereby the effectiveness of the risk management process (as determined in the monitoring, review and continuous improvement process) is communicated to the appropriate parties on an ongoing or periodic basis.

  The external communication and consultation plan should comprise the following activities:

  - Establish a communication process for interactive (two-way) consultation with external stakeholders, e.g. quarterly scheduled meetings to exchange information to address risks, risk factors, risk effects and risk treatment options.
  - Establish a crisis communication strategy facilitating immediate information exchange.

- Establish a communication strategy whereby timeous and appropriate feedback on information exchange with external stakeholders is given to relevant internal parties.
- Formulate a communication evaluation mechanism, whereby external communication is scrutinised for compliance with legal and regulatory requirements.

➢ **Develop and implement a risk information system**. This system should be used to capture, analyse, consolidate, store and report risk information. The risk information captured, analysed, consolidated and reported by the risk information system should have the following attributes:
- **Reliable:** It should be the best attainable information using appropriate techniques (IIA, 2010:Online).
- **Sufficient:** It should be factual, adequate and convincing (IIA, 2010:Online).
- **Relevant:** It should be consistent with the organisational objectives (IIA, 2010:Online).
- **Useful:** It should assist the organisation in meeting its goals (IIA, 2010:Online).
- **Accurate:** It should be factually correct.
- **Timely:** Information should be reported without any long delay to maintain relevance.

7.4.4 Monitoring, review and continuous improvement

The final stage of the risk management process depicted in Figure 7.6, consists of monitoring, review and continuous improvement activities, whereby the effectiveness of the risk management actions are evaluated and assessed in terms of relevance to the changing external and internal environment, and continuous improvement activities promoted. The following monitoring, review and continuous improvement process is proposed for execution by executive management, the risk task team or the designated party:

- **Assign responsibility:** Responsibility should be assigned for monitoring and review actions over the entire risk management process. Responsibility may be assigned holistically for the entire process, or segmentally per activity or department, or in any manner as deemed appropriate. However, if the responsibility is segmented, consolidation of monitoring and review activities should occur with the overall responsibility vested in one individual or team.
- **Establish information flow:** Information should be channelled top-down and bottom-up to enable senior management, the risk task team or the designated party to assess this risk information as well as empower the employees closest to the risk, to take action.
- **Identify and select monitoring and review techniques:** Identify all possible monitoring and review techniques that are appropriate to the enterprise, for example internal audit, external audit, regular reporting, systems testing, etc.
- **Determine timing:** Monitoring, review and continuous improvement activities should be scheduled throughout the entire risk management process on a regular basis. This may be supplemented by ad hoc special investigations into the effectiveness of the risk management process.
- **Assess control effectiveness:** Effectiveness is measured in terms of meeting the process/departmental/organisational objectives. The effectiveness of internal control design and operation, as well as the effectiveness of each of the risk management activities/procedures, should be assessed.
- **Organisational and environmental change assessment:** Sustained focus should be directed at identifying changes in the organisational and external environment in terms of emerging risks, changes in risk character, changing risk priorities and changes in risk action.
- **Control enhancement:** Ineffective controls identified in assessing control effectiveness actions and organisational and environmental change assessment actions should be revised, enhanced and re-implemented to facilitate continuous improvement.

- **Event optimisation:** Analyse the effect of realised risk events, and include this knowledge in the risk management process.
- **Report:** The results from the risk monitoring and review activities, including the progress in implementing risk treatment options, should be captured and reported in the risk register or appendixes thereto.

The monitoring, review and continuous improvement process, which should be operationalised within the organisational environment as well as within the risk management process, is graphically depicted in Figure 7.12.

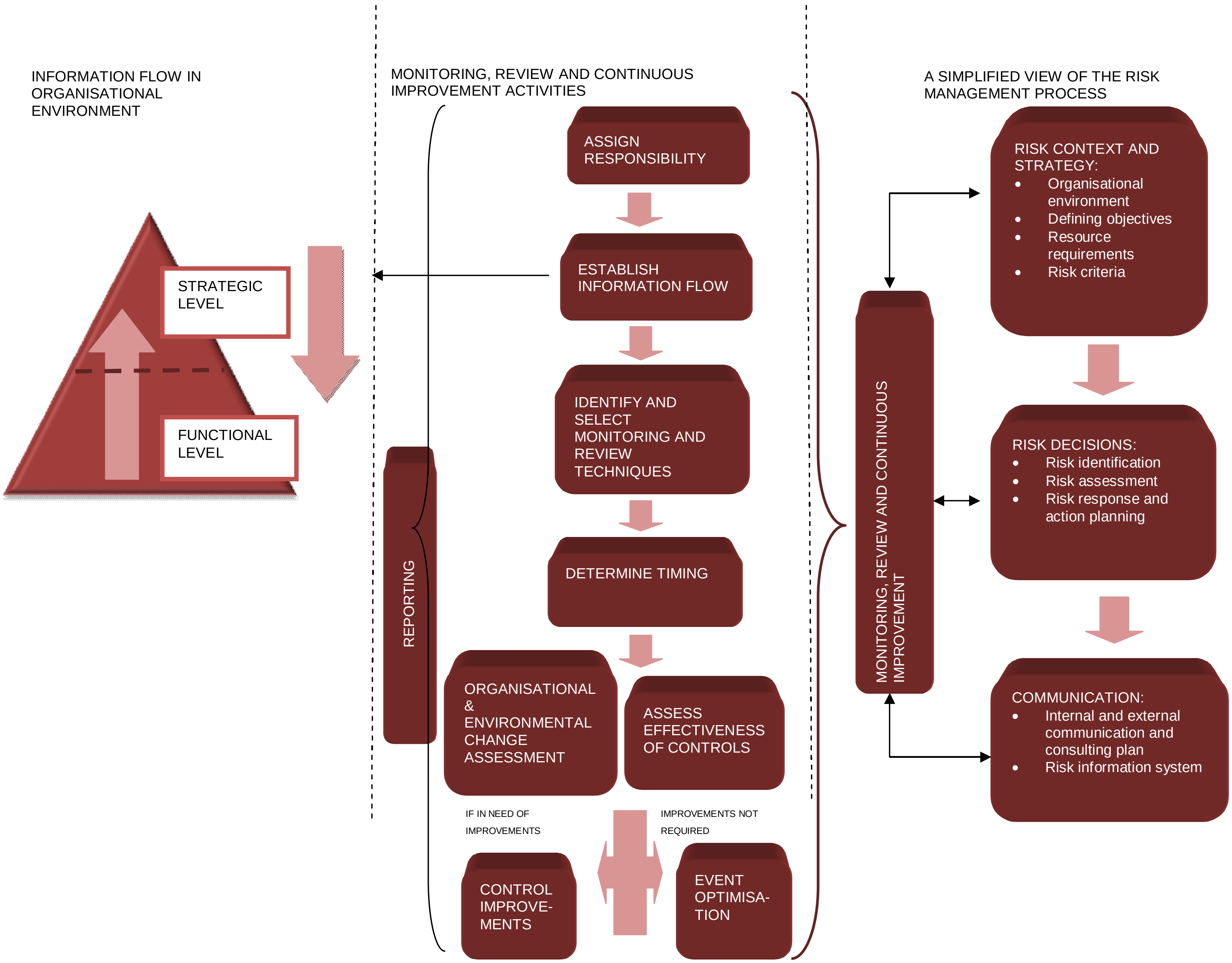


Figure 7.12: Placement of the monitoring, review and continuous improvement activities in the organisational environment and risk management process.

7.5 SME RISK MANAGEMENT FRAMEWORK

The SME risk management framework as depicted in Figure 7.13, provides SME management with an approach to effectively deal with risks at all organisational levels, thereby facilitating the achievement of organisational objectives through effective risk planning, risk implementation and risk evaluation processes.

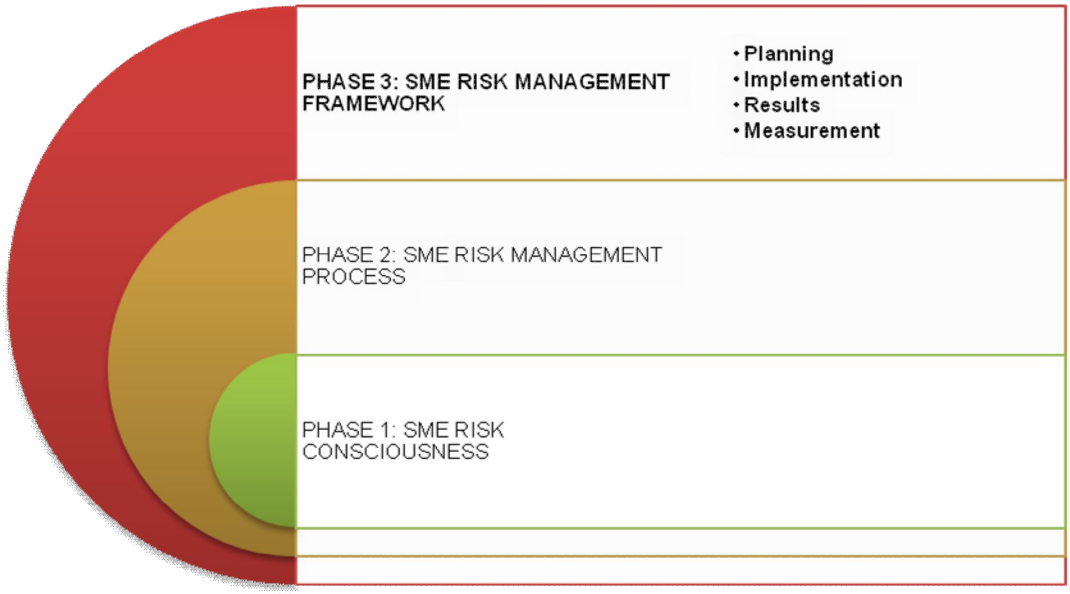
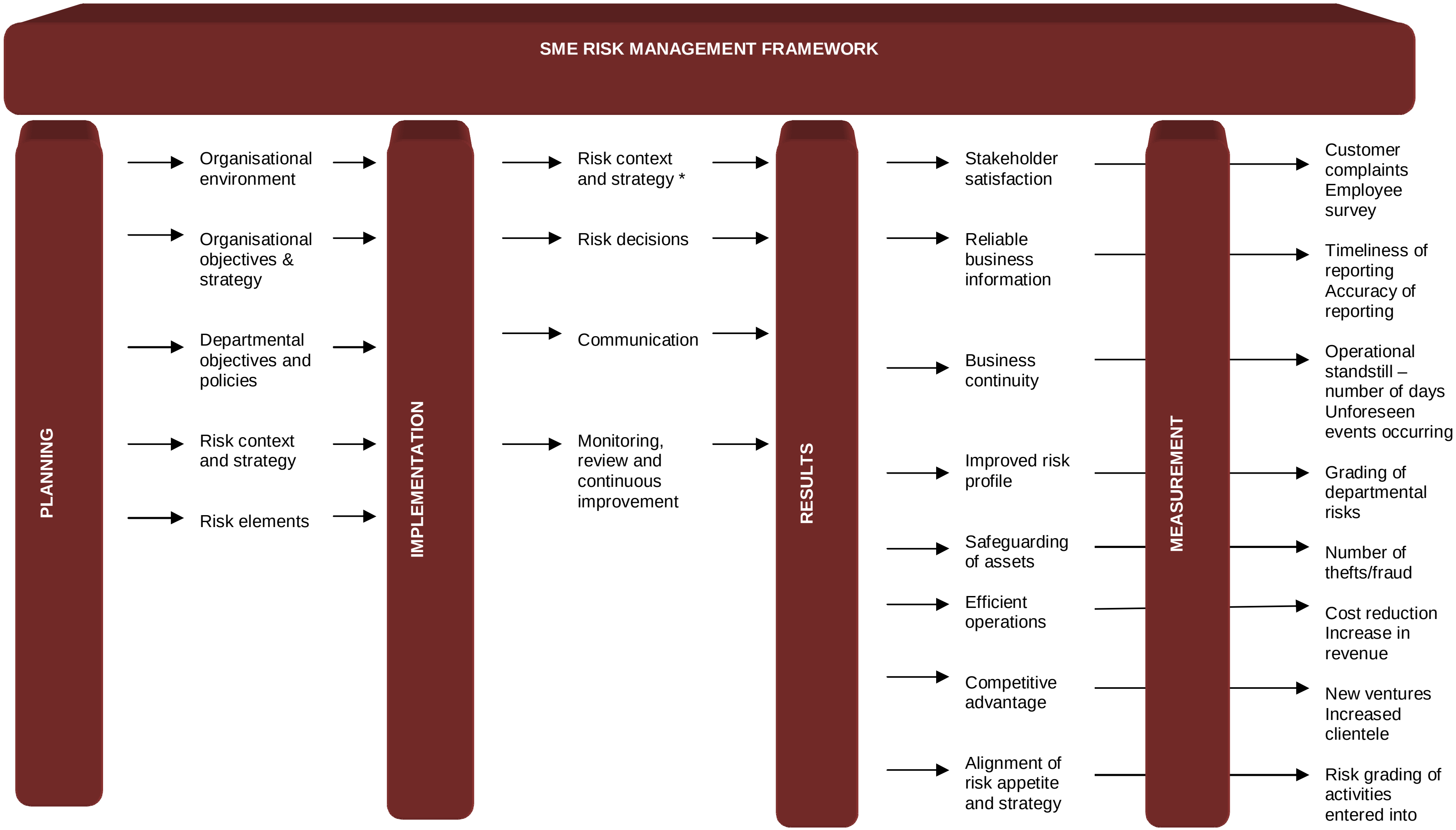


Figure 7.13: The SME risk management framework.

Organisational, departmental, and individual performance measurement are supported by the risk management framework through (a) mapping performance measurement indicators to the risk management framework results, and (b) evaluating its achievement.

7.5.1 SME risk management framework components

The value-adding capabilities of the SME risk management framework is derived from the underpinning four pillars that support the framework, namely planning, implementation, results and measurement. The four pillars or components of the framework are graphically depicted in Figure 7.14.



* Risk context and strategy are discussed under the SME risk management process to effect a better understanding of the initial stage preceding the risk decision process. However, the risk context and strategy phase resorts under the planning phase and provides the foundation for all risk activities to follow.

Figure 7.14: The risk management framework components.

7.5.1.1 Planning

The planning phase underpins all activities in the SME risk management framework. The following should be addressed by SME executive management:

- **Evaluate organisational environment:** Evaluate and develop an understanding of the organisation's internal and external environment. The understanding includes but is not limited to an evaluation of the competitive, social, regulatory and financial environment as well as the development of an understanding of the organisation's strength and weaknesses, the organisation's information systems, established policies and procedures, stakeholder relationships, and the organisation's ethical environment.
- **Formulate organisational objectives and strategy:** Develop organisational long-term objectives aligned with the organisation's risk appetite and its vision and mission. A strategy should be selected to facilitate achievement of the stated objectives. Objectives, whether organisational or departmental, should include measurable performance indicators to evaluate the effective achievement thereof.
- **Formulate departmental objectives and policies:** Departmental objectives should be formulated in alignment with the organisational objectives, along with policies and plans to provide guidance in the execution of the objectives.
- **Risk context and strategy:** As discussed in Paragraph 7.4.1, the risk context and strategy encompass the following:
  - The establishment of the risk management policy.
  - The formulation of objectives as discussed in 'Formulate departmental objectives and policies'.
  - Determining the risk management focus that includes the positioning of risk management within the organisation.
  - Assigning responsibility for risk processes.
  - Determining the resource requirements.
  - The formulation of the risk criteria used in assessing risk.

- **Risk elements:** Risk elements emanate from internal, external or a combination of internal/external risk sources posing a deterrent to organisational success. Management should determine the risk element most applicable to its organisation in order to direct risk management action. Refer to Paragraph 7.3 for a detailed discussion on risk elements.

7.5.1.2 Implementation

Executive management, the risk task team or the designated party is responsible for the implementation phase that entails the execution of the risk management process as extensively discussed in Paragraph 7.4. The implementation phase consists of the following activities:

- The identification of risks that might impede on the achievement of objectives.
- The evaluation and risk classification of risks in terms of frequency and impact.
- The development and implementation of appropriate risk responses.
- Communication, embedded in all risk management activities, consists of:
    - The development of an internal and external communication and consultation plan.
    - The development and implementation of a risk information system.
- The monitoring and review of risk management actions to facilitate continuous improvement.

7.5.1.3 Results

The results phase may also be termed the ‘risk action consequence’, consisting of key performance indicators indicating the achievement of departmental and organisational objectives as defined in the planning phase. The SME objectives highlighted in Figure 7.14 namely:

- Stakeholder satisfaction,
- reliable business information,

- business continuity,
- improved risk profile,
- safeguarding of assets,
- efficient operations,
- competitive advantage, and
- alignment of risk appetite and strategy;

are the most prevalent motivations and benefits according to the conducted survey (see Chapter 6) and literature review (Chapters 2 – 4), however it may differ in terms of the mission and vision of the SME.

The following actions should be taken by the SME executive management in determining the risk action consequence applicable to their SME:

- Assess the given results and determine whether they align with the SME's objectives.
- Make the necessary adjustments to the results.
- Assess and confirm the measurability of the results.

7.5.1.4 Measurement

The SME executive management should assess the effectiveness of the planning and risk management actions in meeting the stated objectives. In measuring the adequacy of the actions taken, management can use any formally defined performance measurement model or framework such as the balanced scorecard; or any informal, in-house designed performance measurement system. The following actions should be taken by executive management in the measurement phase:

- Determine the measurement indicator(s) for each objective, i.e. desired outputs as determined in Paragraph 7.5.1.3.
- Assign responsibility for the evaluation of the indicators.
- Determine the frequency of performance assessments for each indicator.
- Ensure the adequacy of the performance measurement system used in terms of documenting information and reporting information in a

timeous and appropriate manner to the appropriate level in the organisation.

The measurement indicators depicted in Figure 7.14, can be mapped to the desired outputs provided in the results phase.

7.5.2 Application of SME risk management framework

The SME risk management framework provides a structured approach to micro- and small enterprises to effectively manage their risks. Although medium enterprises are excluded from the research, larger enterprises are not prohibited to adjust and apply a similar structured risk management framework.

Due to the diverse nature of SMEs, this framework was developed to primarily address the needs of organisations in the retail sector. The retail-directed focus is prominent in the planning phase of the framework, where the SME risk elements were proposed that generally pose the greatest number of risks to micro- and small enterprises. Although the risk elements are provided, it does not absolve SME owner-managers from the critical tasks of evaluating the given risk elements in the context of their organisational setting, and adjusting the stated elements to reflect the risks impeding on their specific organisational objectives.

The third phase of the framework, namely the results phase, highlights the preferred achievements of effective risk management actions in retail SMEs according to the cited literature sources and survey results. The proposed achievements should however be assessed by executive management and adjusted according to the specific SME objectives. Changes in the results phase will directly affect and thus change the performance evaluation criteria as proposed in the measurement phase, as the listed performance evaluation criteria are related to the desired achievement. SME owner-managers can adjust the performance indicators to include any appropriate indicator that complies with the following criteria:

- The performance indicator should be measurable.
- The performance indicator should be directly related to the specified results objective.

The four phases of the SME risk management framework as depicted in Figure 7.14 imply a sequential approach to risk management with phase one consisting of ‘Planning’, phase two ‘Implementation’, phase three ‘Results’, and phase four ‘Measurement’. However, actions within the different phases can occur simultaneously, or for that matter in a different order, depending on the specific circumstances of the SME. This framework does not purport a rigid risk management approach, as its guidance-providing values flow from its adaptability to any micro- and small retail enterprise.

7.6 HYPOTHESIS, SUBQUESTIONS AND OBJECTIVES RE-VISITED

The research hypothesis, subquestions and objectives are revisited and discussed based on the extensive literature review conducted and the results obtained from the analysis of the survey data.

7.6.1 Subquestions

The following subquestions in support of the research hypothesis were posed in this study:

- “Does a general absence of risk management knowledge by SME owners, adversely impact on the risk efficiency of SMEs?” Survey results indicate that SMEs who follows a structured risk management approach have a clear understanding of risks impacting on their business structure and processes. It was furthermore empirically proven that the absence of a structured risk management approach has an adverse effect on the risk efficiency of SMEs.

- “To what extent can a small organisation like an SME successfully adopt a structured approach to risk management?” and

- "Can a structured approach to risk management, which normally encompasses complex mechanisms, be formulated within SMEs in terms of simplicity and ease of application?" Given the size and managerial structure of SMEs, the process of establishing and using a strategic risk management function is relatively simple, given the close relationship between the owners, managers and operators of the enterprise. It is relatively easy for SME executive management to embed a risk management policy and be routinely and actively involved in the application of a strategic risk management policy (Watt, 2007:34-35). ERM should apply basic risk management activities, embedding the risk champions, i.e. the owner-manager's knowledge of exposure across the entire scope of an enterprises risk, and should not be reduced to a process based solely on risk formulas (Bradford, 2009:4-28). Simplistic risk identification should be used in answering questions such as 'What, how, and why'. The process should be built on expertise and incorporate a forward-thinking approach (Watt, 2007:36-40). Evidence has shown that SMEs flourish on their adaptability and openness towards new ways of working (Berry, 2002:14).

  It is evident from the survey results that 44% of enterprises have five or fewer employees, which imply a more enterprise involved SME owner-manager. The proposed SME risk architecture model provides a detailed, yet simplistic process whereby SME owner-managers can establish a structured risk approach within their SME's, with relative ease.

- "How can control mechanisms for risk exposure be mapped into a structured approach to risk management, to effectively control risks of SMEs?" Control mechanisms are incorporated in phase 2 'SME risk management process' of the proposed SME risk architecture model. Within the SME risk management process, the subprocess of 'risk decisions' deals with the risk control options available to the SME owner-managers based on the defined risk tolerance of their organisations.

- “How can a structured approach to risk management be effectively implemented within South African SMEs, to the benefit of the industry as a whole?” Given the importance of SMEs to the local economy with its ability to provide for the needs of the poor, the use of local resources and its potential contribution to employment, a structured approach to risk management can aid in SMEs’ improved understanding of risk as well as in the formulation of appropriate risk action contributing towards the survival and success of SMEs.

7.6.2 Research objectives

The research objectives defined in Chapter 1 are discussed as follows:

- “Formulate a structured risk model for South African SMEs”.
  An SME risk architecture model, incorporating SME specific risk elements, was developed for use by South African SMEs. The SME risk architecture model details the activities and processes to be followed by the SME owner-manager (or designated individuals), in formulating and embedding a structured risk approach within the SME.

- “Determine the level of risk knowledge by SME owner-managers”. According to the literature review conducted in Chapter 2, 3 and 4, SME owner-managers over-estimate the importance of external risks while they under-estimate internal risk factors. Survey results returned that SME owner-managers rate their level of risk knowledge as sufficient. However, survey results indicate that their primary area of risk focus is directed at financial risks.

- “To determine the current use of risk management models by SME owner-managers, and the adequacy of the current risk methodology applied”. Survey results returned that:

- o 27% of respondents indicated that they had a complete or partial risk management framework in place, primarily focused on financial risks.
- o 37,3% of enterprises do not have a risk management framework, but are planning to implement one.
- o 24,6% of enterprises do not have a risk management framework, and are not planning to implement one.

The adequacy of the current risk management frameworks in place within SMEs is questionable, as 61.4% of respondents indicated that their SMEs experienced financial difficulties in the past. This is reflected in the survival rate of SMEs with the majority of enterprises in operation for 10 years or less.

➢ "To develop a simplistic risk management model". A simplistic SME risk architecture model was developed taking into account:
   - o The ease of use by an SME owner-manager or designated individuals.
   - o The limited resources in terms of time, finance, staff, and information technology available to SMEs.
   - o The level of training and education required to effectively embed this model within SMEs' activities in order to make this model as accessible as possible to all SMEs.

➢ "To determine the implementation viability of the proposed formulated risk management model for South African SMEs, and associated potential benefits, that can be gleaned from such an application". Survey results returned that 60% of respondents without a risk management framework were interested in using such a framework, citing profit maximisation, improved customer service, cost reduction and the safeguarding of assets as motivating factors**.** Arguably, this percentage can be improved since the main obstacles to implementing a risk management framework namely cost, lack of skills or expertise and lack of formalised processes, are reduced when the proposed SME risk architecture model is used.

7.6.3 Research hypothesis

As a result of the research findings of this thesis, the research hypothesis which nedds: "A structured approach to risk management for South African SMEs would significantly limit their risk exposure, and improve the risk efficiency of the industry", is herewith 'accepted'.

7.7 FINAL CONCLUSION

Organisational success was traditionally measured in terms of the organisation's financial achievement. With the collapse of large established enterprises, nationally and internationally over the last two decades, it became apparent that a more balanced organisational perspective should be used by organisations and stakeholders in evaluating the holistic performance of the enterprise. This need gave rise to the 'triple bottom line' effect, where organisations take cognisance of the importance of financial achievement in addition to the importance of their social and environmental impact.

The need for effective holistic management was also echoed in the establishment and maturity of corporate governance[119] codes that proclaimed principles and in some instances rules, to be adhered to by organisations in the effective management of their enterprises. It is evident in these corporate governance codes[120] that the importance of risk management should be escalated to executive management due to the strategic impact risks may have on an organisation. Although it is usually the larger enterprises that strive for and report on corporate governance compliance, smaller enterprises can benefit alike as stakeholder confidence is greatly increased by a well-balanced, managed enterprise.

[119] "Corporate Governance is concerned with the holding of the balance between economic and social goals and between individual and communal goals. The aim is to align as nearly as possible the interest of individuals, corporations and society" (Word Bank Report, 1999. Corporate Governance Overview.)

[120] Reference is specifically made in King 3 - South Africa (King III, 2009: Online), the UK Corporate Governance Code (UK Code, 2010: Online) and the Sarbanes-Oxley Act - United States of America (SOX, 2002:Online).

The SME risk architecture model can assist smaller organisations in aligning their activities to achieve corporate governance compliance in respect of risk management and risk reporting as this model provides structure to the managerial process to be followed, as well as specific guidance on SME areas of risk concern. The SME risk architecture model is therefore not limited to a ‘stand alone’ application, but can be utilised concurrently with the various corporate governance frameworks, as well as the organisational performance management system.

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APPENDIX A

Appendix A depicts the survey questionnaire that will be posted to SME owner-managers in the retail sector in the Western Cape.

BACKGROUND

1. What is the annual turnover of your business?

> R25 million	1
>R20 million – R25 million	2
>R15 million – R20 million	3
>R10 million – R15 million	4
>R5 million – R10 million	5
>R1 million – R5 million	6
>R500 000 – R1 million	7
>R300 000 – R500 000	8
>R150 000 – R300 000	9
R100 000 – R150 000	10
<R100 000	11

2. How many permanent employees does your business employ?

>100	1
50 – 100	2
21 – 49	3
11 – 20	4
6 – 10	5
1 - 5	6

3. What type of entity is your business?

Sole proprietorship	1
Partnership	2
Close corporation	3
Limited company	4
Other	5

3.1 If ‘Other’, please specify the type.

……………………………………………………………………………..

4. What is the age of your business?

> 20 years	1
11 – 20 years	2
6 -10 years	3
3 – 5 years	4
< 3 years	5

5. What is the highest qualification the owner (if an active participant in the business) or else the executive manager hold?

5.1 Owner's qualification (if an active participant in the business):

Post-graduate degree	1
Degree	2
Diploma	3
Post-matriculation (other than the above)	4
Matriculation certificate	5
Grade 8 – Grade 10 / St 6 – St 8	6
Grade 7 / St 5	7
None	8

5.2 Executive manager's qualification:

Post-graduate degree	1
Degree	2
Diploma	3
Post-matriculation (other than the above)	4
Matriculation certificate	5
Grade 8 – Grade 10 (St 6 – St 8)	6
Grade 7 (St 5)	7
None	8

BUSINESS PROCESSES/ACTIVITIES

6. In what area does/did your business receive support from external consultants (ad hoc basis / continuous basis / both)? Mark all the applicable areas.

1. Financial management	yes	no

2. Marketing management	yes	no
3. Operational management	yes	no
4. Administrative management	yes	no
5. Information technology	yes	no
6. Human resource management	yes	no
7. Public relations management	yes	no
8. None	yes	no
9. Other	yes	no

6.1 If ‘Other’ is marked ‘yes’, please specify.

………………………………………………………………………………………………
……………………………………………………………………

7. Has your business experienced any financial problems in the past? Please mark the reason(s) for the financial state.

1.1	No problems experienced	yes	no

Problems experienced due to:			
2.1	Default payments by debtors	yes	no
2.2	Overspending or excessive expenditure	yes	no
2.3	Theft of business resources	yes	no
2.4	Information technology inefficiencies	yes	no
2.5	Personnel - lack of skill	yes	no
2.6	Operational problems	yes	no
2.7	Catastrophic event	yes	no
2.8	Other	yes	no

7.2. If ‘Other’ is marked ‘yes’, please specify:

………………………………………………………………………………………………
…………………………………………………………………

8. Are your business objectives and strategies clearly defined to help determine which activities are critical for the survival of your business?

Yes	1
No	2

9. What type of risk is the most important to your business? Rate the following risks from 1 to 5 where 1 = most important and 5 = least important.

Type of risk	Description of risk	Rate
1.Management risk	Lack of management tools such as cash flow budgets; absence of designated head for each of the business functions	
2.Commercial risk	Competitive position of the company; competitor reaction; demand fluctuations; distribution difficulties	
3.Technological risk	Problems with suppliers; problems with equipment; inadequate production structure; absence of technological development monitoring; absence of research and development; absence of continuous improvement activities	
4. Financial risk	Profitability level; debt load; interest cover; capacity for indebtedness; financing contracts; capacity for reinvesting by current owners	
5.Entrepreneurial risk	Age, experience and training of owner and/or manager	

10. Do you have a clear understanding of the risks that have an impact on your business structure and processes?

Yes	1
No	2

11. To what extent are risks discussed in your business strategy planning?

High	1
Medium	2
Low	3
Do not know	4
Not discussed	5

12. To what extent are risks discussed in your business operational planning?

High	1
Medium	2
Low	3
Do not know	4
Not discussed	5

13. To what extent are risks discussed in your business financial planning?

High	1
Medium	2
Low	3
Do not know	4
Not discussed	5

14. Would you be interested in a risk framework?

Yes	1
No	2

15. What factors would motivate you to implement a risk framework? Mark all the applicable areas.

Improved customer service	yes	no
Minimise cost	yes	no
Maximise profit	yes	no
Reliable business information	yes	no
Safeguarding of assets	yes	no
Regulatory compliance	yes	no
Fraud prevention/detection	yes	no
Continuity of operations	yes	no
Internal compliance	yes	no
Minimise the occurrence of unforeseen events	yes	no
None	yes	no

16. How would you characterise the status of your risk management framework? Tick only one.

We have a completed risk management framework in place	1
We have a partial risk management framework in place	2
We do not have a risk management framework in place, but are planning to implement one	3
We are investigating the concept of a risk management framework	4
We do not have a risk management framework in	5

place and are not planning to implement one	

17. In which function(s) does/do a formal risk identification and assessment take place? Mark all the applicable areas.

Finance	yes	no
Sales/marketing	yes	no
Human resources	yes	no
Operational	yes	no
Procurement	yes	no
None	yes	no
Other	yes	no

17.1 If 'Other' is marked 'yes', please specify.

……………………………………………………………………………………………
……………………………………………………………………

18. What type of action does your business enterprise engage in when risks are identified? Mark the applicable action(s).

Take out insurance	yes	no
Improve internal controls	yes	no
Do not engage in the identified activity	yes	no
Other	yes	no

18.1 If 'Other' is marked 'yes', please specify:

………………………………………………………………………………
………………………………………………………………………………

19. How do you implement or plan to implement risk management activities? Indicate your response by marking one of the options provided.

Holistically – across the entire enterprise	1
Incrementally – by department/function	2
Incrementally – by type of risk (finance/operational etc)	3
Incrementally – other	4
Not applicable	5

19.1 If 'Other', please specify:

……………………………………………………………………………………………
………………………………………………………………………

20. Which obstacles hinder your business in implementing a risk management framework? Mark all the applicable obstacles.

No obstacles experienced	yes	no
Not perceived as a priority by management	yes	no
Lack of formalised processes	yes	no
Lack of technology	yes	no
Lack of intellectual capital (know-how)	yes	no
Benefit does not justify the effort	yes	no
Cost	yes	no
Lack of skills	yes	no

21. Would you like to receive feedback on the study?

Yes	No

Contact detail

Contact person	
Preferred method of contact: E-mail Telephone Fax	
Contact detail (e-mail address or telephone number or fax number)	

APPENDIX B

Descriptive statistics for each variable

Q01	Frequency	Percent	Cumulative Frequency	Cumulative Percent
>R25 million	5	3.16	5	3.16
>R20 million - R25 million	2	1.27	7	4.43
>R15 million - R20 million	2	1.27	9	5.70
>R10 million - R15 million	8	5.06	17	10.76
>R5 million - R10 million	7	4.43	24	15.19
>R1 million - R5 million	24	15.19	48	30.38
>R500 000 - R1 million	17	10.76	65	41.14
>R300 000 - R500 000	14	8.86	79	50.00
>R150 000 - R300 000	33	20.89	112	70.89
R100 000 - R150 000	22	13.92	134	84.81
<R100 000	24	15.19	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	75.6456
DF	10
Pr > ChiSq	<.0001

Sample Size = 158

Q02	Frequency	Percent	Cumulative Frequency	Cumulative Percent
>100	3	1.90	3	1.90
50-100	3	1.90	6	3.80
21-49	23	14.56	29	18.35
11-20	27	17.09	56	35.44
6-10	33	20.89	89	56.33
1-5	69	43.67	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	112.6076
DF	5
Pr > ChiSq	<.0001

Sample Size = 158

Q03	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Sole proprietorship	61	38.61	61	38.61
Partnership	30	18.99	91	57.59
Close Corporation	50	31.65	141	89.24
Limited Company	15	9.49	156	98.73
Other	2	1.27	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	74.5949
DF	4
Pr > ChiSq	<.0001

Sample Size = 158

Q03_1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Alleen Eienaar	1	100.00	1	100.00

Q04	Frequency	Percent	Cumulative Frequency	Cumulative Percent
> 20 years	9	5.70	9	5.70
11-20 years	29	18.35	38	24.05
6-10 years	42	26.58	80	50.63
3-5 years	48	30.38	128	81.01
<3 years	30	18.99	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	28.3924
DF	4
Pr > ChiSq	<.0001

Sample Size = 158

Q05_1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	7	4.43	7	4.43
Post graduate degree	21	13.29	28	17.72
Degree	27	17.09	55	34.81
Diploma	41	25.95	96	60.76
Post matriculation (other)	18	11.39	114	72.15
Matriculation certificate	36	22.78	150	94.94
Grade 8 - Grade 10	5	3.16	155	98.10
Grade 7	1	0.63	156	98.73
None	2	1.27	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	101.1772
DF	8
Pr > ChiSq	<.0001

Sample Size = 158

Q05_2	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	11	6.96	11	6.96
Post graduate degree	15	9.49	26	16.46
Degree	21	13.29	47	29.75
Diploma	50	31.65	97	61.39
Post matriculation (other)	15	9.49	112	70.89
Matriculation certificate	33	20.89	145	91.77
Grade 8 - Grade 10	3	1.90	148	93.67
Grade 7	1	0.63	149	94.30
None	9	5.70	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	109.2658
DF	8
Pr > ChiSq	<.0001

Sample Size = 158

Q06_01	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	62	39.24	62	39.24
No	96	60.76	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	7.3165
DF	1
Pr > ChiSq	0.0068

Sample Size = 158

Q06_02	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	56	35.44	56	35.44
No	102	64.56	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	13.3924
DF	1
Pr > ChiSq	0.0003

Sample Size = 158

Q06_03	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	29	18.35	29	18.35
No	129	81.65	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	63.2911
DF	1
Pr > ChiSq	<.0001

Sample Size = 158

Q06_04	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	29	18.35	29	18.35
No	129	81.65	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	63.2911
DF	1
Pr > ChiSq	<.0001

Sample Size = 158

Q06_05	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	52	32.91	52	32.91
No	106	67.09	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	18.4557
DF	1
Pr > ChiSq	<.0001

Sample Size = 158

Q06_06	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	25	15.82	25	15.82
No	133	84.18	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	73.8228
DF	1
Pr > ChiSq	<.0001

Sample Size = 158

Q06_07	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	25	15.82	25	15.82
No	133	84.18	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	73.8228
DF	1
Pr > ChiSq	<.0001

Sample Size = 158

Q06_08	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	52	32.91	52	32.91
No	106	67.09	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	18.4557
DF	1
Pr > ChiSq	<.0001

Sample Size = 158

Q06_09	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	3	1.90	3	1.90
No	155	98.10	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	146.2278
DF	1
Pr > ChiSq	<.0001

Sample Size = 158

Q06_1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Deals with things amongst employees	1	33.33	1	33.33
Financial Statements	1	33.33	2	66.67
We both worked overseas, gaining retail experience and fashion knowledge "Supply and Demand"	1	33.33	3	100.00

Q07_1_1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	61	38.61	61	38.61
No	97	61.39	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	8.2025
DF	1
Pr > ChiSq	0.0042

Sample Size = 158

Q07_2_01	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	35	22.15	35	22.15
No	123	77.85	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	49.0127
DF	1
Pr > ChiSq	<.0001

Sample Size = 158

Q07_2_02	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	44	27.85	44	27.85
No	114	72.15	158	100.00

Chi-Square Test for Equal Proportions	
Chi-Square	31.0127
DF	1
Pr > ChiSq	<.0001

Sample Size = 158

Q07_2_03	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	61	38.61	61	38.61
No	97	61.39	158	100.00

Chi-Square Test for Equal Proportions	
Chi-Square	8.2025
DF	1
Pr > ChiSq	0.0042

Sample Size = 158

Q07_2_04	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	30	18.99	30	18.99
No	128	81.01	158	100.00

Chi-Square Test for Equal Proportions	
Chi-Square	60.7848
DF	1
Pr > ChiSq	<.0001

Sample Size = 158

Q07_2_05	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	32	20.25	32	20.25
No	126	79.75	158	100.00

Chi-Square Test for Equal Proportions	
Chi-Square	55.9241
DF	1
Pr > ChiSq	<.0001

Sample Size = 158

Q07_2_06	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	36	22.78	36	22.78
No	122	77.22	158	100.00

Chi-Square Test for Equal Proportions	
Chi-Square	46.8101
DF	1
Pr > ChiSq	<.0001

Sample Size = 158

Q07_2_07	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	14	8.86	14	8.86
No	144	91.14	158	100.00

Chi-Square Test for Equal Proportions	
Chi-Square	106.9620
DF	1
Pr > ChiSq	<.0001

Sample Size = 158

Q07_2_08	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	7	4.43	7	4.43
No	151	95.57	158	100.00

Chi-Square Test for Equal Proportions	
Chi-Square	131.2405
DF	1
Pr > ChiSq	<.0001

Sample Size = 158

Q07_2_1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Bad Economy	1	16.67	1	16.67
Late Payments	1	16.67	2	33.33
Mismanagement	1	16.67	3	50.00
Not enough customers to buy from the shop	1	16.67	4	66.67

Retail is different everyday. Sales have dropped from time to time due to economic times	1	16.67	5	83.33
Suppliers	1	16.67	6	100.00

Q08	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	135	85.44	135	85.44
No	23	14.56	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	79.3924
DF	1
Pr > ChiSq	<.0001

Sample Size = 158

Q09_1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	0.63	1	0.63
Most important	38	24.05	39	24.68
Important	27	17.09	66	41.77
Neutral	35	22.15	101	63.92
Not so important	33	20.89	134	84.81
Least important	24	15.19	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	34.3038
DF	5
Pr > ChiSq	<.0001

Sample Size = 158

Q09_2	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	0.63	1	0.63
Most important	35	22.15	36	22.78
Important	31	19.62	67	42.41
Neutral	43	27.22	110	69.62
Not so important	28	17.72	138	87.34
Least important	20	12.66	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	40.2278
DF	5
Pr > ChiSq	<.0001

Sample Size = 158

Q09_3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	0.63	1	0.63
Most important	37	23.42	38	24.05
Important	28	17.72	66	41.77
Neutral	25	15.82	91	57.59
Not so important	30	18.99	121	76.58
Least important	37	23.42	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	33.6962
DF	5
Pr > ChiSq	<.0001

Sample Size = 158

Q09_4	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	0.63	1	0.63
Most important	52	32.91	53	33.54
Important	29	18.35	82	51.90
Neutral	32	20.25	114	72.15
Not so important	17	10.76	131	82.91
Least important	27	17.09	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	54.2025
DF	5
Pr > ChiSq	<.0001

Sample Size = 158

Q09_5	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	0.63	1	0.63
Most important	28	17.72	29	18.35
Important	23	14.56	52	32.91
Neutral	28	17.72	80	50.63
Not so important	33	20.89	113	71.52

Least important	45	28.48	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	39.9241
DF	5
Pr > ChiSq	<.0001

Sample Size = 158

Q10	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	138	87.34	138	87.34
No	20	12.66	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	88.1266
DF	1
Pr > ChiSq	<.0001

Sample Size = 158

Q11	Frequency	Percent	Cumulative Frequency	Cumulative Percent
High	41	25.95	41	25.95
Medium	55	34.81	96	60.76
Low	30	18.99	126	79.75
Do not know	14	8.86	140	88.61
Not discussed	18	11.39	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	35.8608
DF	4
Pr > ChiSq	<.0001

Sample Size = 158

Q12	Frequency	Percent	Cumulative Frequency	Cumulative Percent
High	40	25.32	40	25.32
Medium	64	40.51	104	65.82
Low	35	22.15	139	87.97
Do not know	7	4.43	146	92.41
Not discussed	12	7.59	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	67.1266
DF	4
Pr > ChiSq	<.0001

Sample Size = 158

Q13	Frequency	Percent	Cumulative Frequency	Cumulative Percent
High	66	41.77	66	41.77
Medium	56	35.44	122	77.22
Low	22	13.92	144	91.14
Do not know	7	4.43	151	95.57
Not discussed	7	4.43	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	97.5063
DF	4
Pr > ChiSq	<.0001

Sample Size = 158

Q14	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	97	61.39	97	61.39
No	61	38.61	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	8.2025
DF	1
Pr > ChiSq	0.0042

Sample Size = 158

Q15_01	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	130	82.28	130	82.28
No	28	17.72	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	65.8481

DF 1
Pr > ChiSq <.0001
Sample Size = 158

Q15_02	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	123	77.85	123	77.85
No	35	22.15	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	49.0127
DF	1
Pr > ChiSq	<.0001

Sample Size = 158

Q15_03	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	139	87.97	139	87.97
No	19	12.03	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	91.1392
DF	1
Pr > ChiSq	<.0001

Sample Size = 158

Q15_04	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	93	58.86	93	58.86
No	65	41.14	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	4.9620
DF	1
Pr > ChiSq	0.0259

Sample Size = 158

Q15_05	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	112	70.89	112	70.89
No	46	29.11	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	27.5696
DF	1
Pr > ChiSq	<.0001

Sample Size = 158

Q15_06	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	84	53.16	84	53.16
No	74	46.84	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	0.6329
DF	1
Pr > ChiSq	0.4263

Sample Size = 158

Q15_07	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	109	68.99	109	68.99
No	49	31.01	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	22.7848
DF	1
Pr > ChiSq	<.0001

Sample Size = 158

Q15_08	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	103	65.19	103	65.19
No	55	34.81	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	14.5823
DF	1

Pr > ChiSq	0.0001

Sample Size = 158

Q15_09	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	79	50.00	79	50.00
No	79	50.00	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	0.0000
DF	1
Pr > ChiSq	1.0000

Sample Size = 158

Q15_10	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	105	66.46	105	66.46
No	53	33.54	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	17.1139
DF	1
Pr > ChiSq	<.0001

Sample Size = 158

Q15_11	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	6	3.80	6	3.80
No	152	96.20	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	134.9114
DF	1
Pr > ChiSq	<.0001

Sample Size = 158

Q16	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Completed RMFW	19	12.03	19	12.03
Partial RMFW	31	19.62	50	31.65
Plan RMFW	44	27.85	94	59.49
Investigate RMFW	26	16.46	120	75.95
Do not plan RMFW	38	24.05	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	12.1899
DF	4
Pr > ChiSq	0.0160

Sample Size = 158

Q17_01	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	116	73.42	116	73.42
No	42	26.58	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	34.6582
DF	1
Pr > ChiSq	<.0001

Sample Size = 158

Q17_02	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	87	55.06	87	55.06
No	71	44.94	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	1.6203
DF	1
Pr > ChiSq	0.2031

Sample Size = 158

Q17_03	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	39	24.68	39	24.68
No	119	75.32	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	40.5063
DF	1
Pr > ChiSq	<.0001

Sample Size = 158

Q17_04	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	89	56.33	89	56.33
No	69	43.67	158	100.00

Chi-Square Test for Equal Proportions

Chi-Square	2.5316
DF	1
Pr > ChiSq	0.1116

Sample Size = 158

Q17_05	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	56	35.44	56	35.44
No	102	64.56	158	100.00

Chi-Square Test for Equal Proportions

Chi-Square	13.3924
DF	1
Pr > ChiSq	0.0003

Sample Size = 158

Q17_06	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	20	12.66	20	12.66
No	138	87.34	158	100.00

Chi-Square Test for Equal Proportions

Chi-Square	88.1266
DF	1
Pr > ChiSq	<.0001

Sample Size = 158

Q17_07	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	158	100.00	158	100.00

Chi-Square Test for Equal Proportions

Chi-Square	0.0000
DF	0
Pr > ChiSq	.

Sample Size = 158

Q17_1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Handled by himself	1	100.00	1	100.00

Q18_01	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	92	58.23	92	58.23
No	66	41.77	158	100.00

Chi-Square Test for Equal Proportions

Chi-Square	4.2785
DF	1
Pr > ChiSq	0.0386

Sample Size = 158

Q18_02	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	120	75.95	120	75.95
No	38	24.05	158	100.00

Chi-Square Test for Equal Proportions

Chi-Square	42.5570
DF	1
Pr > ChiSq	<.0001

Sample Size = 158

Q18_03	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	32	20.25	32	20.25
No	126	79.75	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	55.9241
DF	1
Pr > ChiSq	<.0001

Sample Size = 158

Q18_04	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	3	1.90	3	1.90
No	155	98.10	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	146.2278
DF	1
Pr > ChiSq	<.0001

Sample Size = 158

Q18_1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Investigate risk properly and discuss appropriate action to take	1	50.00	1	50.00
Security - late night functions	1	50.00	2	100.00

Q19	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	59	37.34	59	37.34
2	17	10.76	76	48.10
3	45	28.48	121	76.58
4	2	1.27	123	77.85
5	35	22.15	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	64.2785
DF	4
Pr > ChiSq	<.0001

Sample Size = 158

Q19_1	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Q20_1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	49	31.01	49	31.01
No	109	68.99	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	22.7848
DF	1
Pr > ChiSq	<.0001

Sample Size = 158

Q20_2	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	36	22.78	36	22.78
No	122	77.22	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	46.8101
DF	1
Pr > ChiSq	<.0001

Sample Size = 158

Q20_3

Q20_3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	51	32.28	51	32.28
No	107	67.72	158	100.00

Chi-Square Test
for Equal Proportions

Chi-Square	19.8481
DF	1
Pr > ChiSq	<.0001

Sample Size = 158

Q20_4	Frequency	Percent	Cumulative Frequency	Cumulative Percent

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ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
  Yes          45       28.48            45        28.48
  No          113       71.52           158       100.00

                     Chi-Square Test
                  for Equal Proportions
                  ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
                  Chi-Square    29.2658
                  DF                  1
                  Pr > ChiSq     <.0001
                    Sample Size = 158

                                  Cumulative    Cumulative
Q20_5    Frequency     Percent     Frequency      Percent
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
  Yes          47       29.75            47        29.75
  No          111       70.25           158       100.00


                     Chi-Square Test
                  for Equal Proportions
                  ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
                  Chi-Square    25.9241
                  DF                  1
                  Pr > ChiSq     <.0001
                    Sample Size = 158

                                  Cumulative    Cumulative
Q20_6    Frequency     Percent     Frequency      Percent
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
  Yes          36       22.78            36        22.78
  No          122       77.22           158       100.00

                     Chi-Square Test
                  for Equal Proportions
                  ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
                  Chi-Square    46.8101
                  DF                  1
                  Pr > ChiSq     <.0001
                    Sample Size = 158

                                  Cumulative    Cumulative
Q20_7    Frequency     Percent     Frequency      Percent
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
  Yes          70       44.30            70        44.30
  No           88       55.70           158       100.00

                     Chi-Square Test
                  for Equal Proportions
                  ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
                  Chi-Square     2.0506
                  DF                  1
                  Pr > ChiSq     0.1521
                    Sample Size = 158

                                  Cumulative    Cumulative
Q20_8    Frequency     Percent     Frequency      Percent
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
  Yes          52       32.91            52        32.91
  No          106       67.09           158       100.00

                     Chi-Square Test
                  for Equal Proportions
                  ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
                  Chi-Square    18.4557
                  DF                  1
                  Pr > ChiSq     <.0001
                    Sample Size = 158

                                 Cumulative    Cumulative
 Q21    Frequency     Percent     Frequency      Percent
 ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
 Yes           62       39.24            62        39.24
 No            96       60.76           158       100.00

                     Chi-Square Test
                  for Equal Proportions
                  ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
                  Chi-Square     7.3165
                  DF                  1
                  Pr > ChiSq     0.0068
                    Sample Size = 158
```

APPENDIX C

Cronbach Alpha Coefficients

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum	Label
Q06_01	158	1.60759	0.48984	254.00000	1.00000	2.00000	Q06_01
Q06_02	158	1.64557	0.47986	260.00000	1.00000	2.00000	Q06_02
Q06_03	158	1.81646	0.38834	287.00000	1.00000	2.00000	Q06_03
Q06_04	158	1.81646	0.38834	287.00000	1.00000	2.00000	Q06_04
Q06_05	158	1.67089	0.47139	264.00000	1.00000	2.00000	Q06_05
Q06_06	158	1.84177	0.36611	291.00000	1.00000	2.00000	Q06_06
Q06_07	158	1.84177	0.36611	291.00000	1.00000	2.00000	Q06_07
q06_08n	158	1.32911	0.47139	210.00000	1.00000	2.00000	
Q06_09	158	1.98101	0.13691	313.00000	1.00000	2.00000	Q06_09
q07_1_1n	158	1.38608	0.48840	219.00000	1.00000	2.00000	
Q07_2_01	158	1.77848	0.41659	281.00000	1.00000	2.00000	Q07_2_01
Q07_2_02	158	1.72152	0.44968	272.00000	1.00000	2.00000	Q07_2_02
Q07_2_03	158	1.61392	0.48840	255.00000	1.00000	2.00000	Q07_2_03
Q07_2_04	158	1.81013	0.39345	286.00000	1.00000	2.00000	Q07_2_04
Q07_2_05	158	1.79747	0.40316	284.00000	1.00000	2.00000	Q07_2_05
Q07_2_06	158	1.77215	0.42078	280.00000	1.00000	2.00000	Q07_2_06
Q07_2_07	158	1.91139	0.28508	302.00000	1.00000	2.00000	Q07_2_07
Q07_2_08	158	1.95570	0.20642	309.00000	1.00000	2.00000	Q07_2_08
Q08	158	1.14557	0.35380	181.00000	1.00000	2.00000	Q08
Q09_1	157	2.85987	1.39807	449.00000	1.00000	5.00000	Q09_1
Q09_2	157	2.78981	1.32061	438.00000	1.00000	5.00000	Q09_2
Q09_3	157	3.01274	1.50634	473.00000	1.00000	5.00000	Q09_3
Q09_4	157	2.60510	1.47091	409.00000	1.00000	5.00000	Q09_4
Q09_5	157	3.28025	1.46688	515.00000	1.00000	5.00000	Q09_5
Q10	158	1.12658	0.33356	178.00000	1.00000	2.00000	Q10
Q11	158	2.44937	1.27967	387.00000	1.00000	5.00000	Q11
Q12	158	2.28481	1.12353	361.00000	1.00000	5.00000	Q12
Q13	158	1.94304	1.06624	307.00000	1.00000	5.00000	Q13
Q14	158	1.38608	0.48840	219.00000	1.00000	2.00000	Q14
Q15_01	158	1.17722	0.38306	186.00000	1.00000	2.00000	Q15_01
Q15_02	158	1.22152	0.41659	193.00000	1.00000	2.00000	Q15_02
Q15_03	158	1.12025	0.32629	177.00000	1.00000	2.00000	Q15_03
Q15_04	158	1.41139	0.49365	223.00000	1.00000	2.00000	Q15_04
Q15_05	158	1.29114	0.45573	204.00000	1.00000	2.00000	Q15_05
Q15_06	158	1.46835	0.50058	232.00000	1.00000	2.00000	Q15_06
Q15_07	158	1.31013	0.46402	207.00000	1.00000	2.00000	Q15_07
Q15_08	158	1.34810	0.47788	213.00000	1.00000	2.00000	Q15_08
Q15_09	158	1.50000	0.50159	237.00000	1.00000	2.00000	Q15_09
Q15_10	158	1.33544	0.47365	211.00000	1.00000	2.00000	Q15_10
q15_11n	158	1.03797	0.19174	164.00000	1.00000	2.00000	
Q16	158	3.20886	1.33093	507.00000	1.00000	5.00000	Q16
Q17_01	158	1.26582	0.44318	200.00000	1.00000	2.00000	Q17_01
Q17_02	158	1.44937	0.49901	229.00000	1.00000	2.00000	Q17_02
Q17_03	158	1.75316	0.43254	277.00000	1.00000	2.00000	Q17_03
Q17_04	158	1.43671	0.49756	227.00000	1.00000	2.00000	Q17_04
Q17_05	158	1.64557	0.47986	260.00000	1.00000	2.00000	Q17_05
q17_06n	158	1.12658	0.33356	178.00000	1.00000	2.00000	
Q18_01	158	1.41772	0.49475	224.00000	1.00000	2.00000	Q18_01
Q18_02	158	1.24051	0.42875	196.00000	1.00000	2.00000	Q18_02
Q18_03	158	1.79747	0.40316	284.00000	1.00000	2.00000	Q18_03
Q18_04	158	1.98101	0.13691	313.00000	1.00000	2.00000	Q18_04
Q19	158	2.60127	1.53490	411.00000	1.00000	5.00000	Q19
q20_1n	158	1.31013	0.46402	207.00000	1.00000	2.00000	
Q20_2	158	1.77215	0.42078	280.00000	1.00000	2.00000	Q20_2
Q20_3	158	1.67722	0.46903	265.00000	1.00000	2.00000	Q20_3
Q20_4	158	1.71519	0.45276	271.00000	1.00000	2.00000	Q20_4
Q20_5	158	1.70253	0.45860	269.00000	1.00000	2.00000	Q20_5
Q20_6	158	1.77215	0.42078	280.00000	1.00000	2.00000	Q20_6
Q20_7	158	1.55696	0.49832	246.00000	1.00000	2.00000	Q20_7
Q20_8	158	1.67089	0.47139	264.00000	1.00000	2.00000	Q20_8

Cronbach Coefficient Alpha

Variables	Alpha
Raw	0.759912
Standardized	0.826737

Cronbach Coefficient Alpha with Deleted Variable

	Raw Variables		Standardized Variables		
Deleted Variable	Correlation with Total	Alpha	Correlation with Total	Alpha	Label
Q06_01	0.240717	0.755962	0.252226	0.824192	Q06_01
Q06_02	0.325871	0.753956	0.345306	0.822172	Q06_02
Q06_03	0.168426	0.757951	0.170144	0.825956	Q06_03
Q06_04	0.268883	0.756002	0.246054	0.824325	Q06_04
Q06_05	0.316195	0.754268	0.332544	0.822450	Q06_05
Q06_06	0.155256	0.758258	0.136740	0.826669	Q06_06
Q06_07	0.216944	0.757133	0.203462	0.825241	Q06_07
q06_08n	0.477256	0.750408	0.489306	0.819006	
Q06_09	0.078731	0.759729	0.041883	0.828680	Q06_09
q07_1_1n	0.163996	0.757842	0.251917	0.824198	
Q07_2_01	0.106754	0.759151	0.116425	0.827101	Q07_2_01
Q07_2_02	0.238708	0.756223	0.275869	0.823680	Q07_2_02
Q07_2_03	0.221885	0.756431	0.316032	0.822809	Q07_2_03
Q07_2_04	0.192128	0.757472	0.227154	0.824732	Q07_2_04
Q07_2_05	0.059086	0.760095	0.142378	0.826549	Q07_2_05
Q07_2_06	0.011951	0.761122	0.080756	0.827858	Q07_2_06
Q07_2_07	0.123388	0.758961	0.148261	0.826423	Q07_2_07
Q07_2_08	-.081933	0.761260	-.122191	0.832108	Q07_2_08
Q08	0.172492	0.757987	0.111468	0.827207	Q08
Q09_1	0.206491	0.760069	0.138650	0.826628	Q09_1

Q09_2	-.002955	0.772703	0.021274	0.829114	Q09_2
Q09_3	0.168241	0.764200	0.149487	0.826397	Q09_3
Q09_4	0.248443	0.757833	0.178422	0.825778	Q09_4
Q09_5	-.022651	0.777024	-.021449	0.830011	Q09_5
Q10	0.170388	0.758098	0.094588	0.827565	Q10
Q11	0.383780	0.747321	0.285224	0.823478	Q11
Q12	0.319743	0.751251	0.221212	0.824860	Q12
Q13	0.388230	0.747473	0.292864	0.823312	Q13
Q14	0.314898	0.754146	0.354148	0.821979	Q14
Q15_01	0.273998	0.755946	0.332672	0.822447	Q15_01
Q15_02	0.335924	0.754379	0.404722	0.820871	Q15_02
Q15_03	0.252333	0.756793	0.334143	0.822415	Q15_03
Q15_04	0.370355	0.752713	0.404692	0.820872	Q15_04
Q15_05	0.285125	0.755127	0.321261	0.822695	Q15_05
Q15_06	0.402368	0.751817	0.444942	0.819986	Q15_06
Q15_07	0.359716	0.753315	0.399965	0.820976	Q15_07
Q15_08	0.187381	0.757299	0.222159	0.824840	Q15_08
Q15_09	0.362874	0.752811	0.388548	0.821226	Q15_09
Q15_10	0.372889	0.752888	0.410415	0.820746	Q15_10
q15_11n	0.250407	0.758010	0.285365	0.823475	
Q16	0.315171	0.752062	0.276409	0.823669	Q16
Q17_01	0.492731	0.750559	0.455403	0.819755	Q17_01
Q17_02	0.211704	0.756642	0.218028	0.824928	Q17_02
Q17_03	0.334187	0.754243	0.352148	0.822022	Q17_03
Q17_04	0.282736	0.754873	0.312440	0.822887	Q17_04
Q17_05	0.324549	0.753988	0.385665	0.821289	Q17_05
q17_06n	0.443137	0.753534	0.458525	0.819687	
Q18_01	0.071791	0.760097	0.079727	0.827880	Q18_01
Q18_02	0.329782	0.754379	0.264027	0.823937	Q18_02
Q18_03	-.064071	0.762534	-.069356	0.831011	Q18_03
Q18_04	0.163739	0.759154	0.140009	0.826599	Q18_04
Q19	0.248148	0.758549	0.247825	0.824287	Q19
q20_1n	0.258192	0.755691	0.343433	0.822213	
Q20_2	0.090808	0.759486	0.153041	0.826321	Q20_2
Q20_3	0.302340	0.754618	0.379636	0.821421	Q20_3
Q20_4	0.238014	0.756221	0.283096	0.823524	Q20_4
Q20_5	0.298226	0.754802	0.380149	0.821410	Q20_5
Q20_6	0.062173	0.760081	0.148855	0.826410	Q20_6
Q20_7	0.318113	0.753978	0.414850	0.820649	Q20_7
Q20_8	0.086870	0.759669	0.194248	0.825439	Q20_8

APPENDIX C1

Table 6.1: Cronbach's Alpha coefficients for survey measuring instrument.

Statements		Variable nr.	Correlation with total	Cronbach Alpha coefficient
6.1	Area receiving support from external consultants: Financial Management.	Q06_01	0.2522	0.8242
6.2	Area receiving support from external consultants: Marketing Management.	Q06_02	0.3453	0.8222
6.3	Area receiving support from external consultants: Operational Management.	Q06_03	0.1701	0.8260
6.4	Area receiving support from external consultants: Administrative Management.	Q06_04	0.2460	0.8243
6.5	Area receiving support from external consultants: Information Technology.	Q06_05	0.3325	0.8224
6.6	Area receiving support from external consultants: Human Resource Management.	Q06_06	0.1367	0.8267
6.7	Area receiving support from external consultants: Public Relation Management.	Q06_07	0.2035	0.8252
6.8	Area receiving support from external consultants: None.	Q06_08n	0.4893	0.8190
6.9	Area receiving support from external consultants: Other.	Q06_09	0.0419	0.8287
7.1.1	Business experienced no problems.	Q07_1_01n	0.2519	0.8242
7.2.1	Business experience problems due to: Default payments by debtors.	Q07_2_01	0.1164	0.8271
7.2.2	Business experience problems due to: Overspending or excessive expenditure.	Q07_2_02	0.2759	0.8237
7.2.3	Business experience problems due to: Theft of business resources.	Q07_2_03	0.3160	0.8228
7.2.4	Business experience problems due to: Information Technology inefficiencies.	Q07_2_04	0.2272	0.8247
7.2.5	Business experience problems due to: Personnel – lack of skill.	Q07_2_05	0.1424	0.8265
7.2.6	Business experience problems due to: Operational problems.	Q07_2_06	0.0808	0.8279
7.2.7	Business experience problems due to: Catastrophic event.	Q07_2_07	0.1483	0.8264
7.2.8	Business experience problems due to: Other.	Q07_2_08	-0.1222	0.8321
8.	Are your business objectives and strategies clearly defined to help determine which activities are critical for the survival of your business?	Q08	0.1115	0.8272
9.1	Management risk.	Q09_1	0.1386	0.8266
9.2	Commercial risk.	Q09_2	0.0213	0.8291
9.3	Technological risk.	Q09_3	0.1495	0.8264
9.4	Financial risk.	Q09_4	0.1784	0.8258
9.5	Entrepreneurial risk.	Q09_5	-0.0214	0.8300
10.	Do you have a clear understanding of the risks that have an impact on your business structure and processes?	Q10	0.0946	0.8276

Statements	Variable nr.	Correlation with total	Cronbach Alpha coefficient
11. To what extent are risks discussed in your business strategic planning?	Q11	0.2852	0.8235
12. To what extent are risks discussed in your business operational planning?	Q12	0.2212	0.8249
13. To what extent are risks discussed in your business financial planning?	Q13	0.2929	0.8233
14. Would you be interested in a risk framework?	Q14	0.3541	0.8220
15.1 Factors to motivate implementation of risk framework: Improved customer service.	Q15_01	0.3327	0.8224
15.2 Factors to motivate implementation of risk framework: Minimised costs.	Q15_02	0.4047	0.8209
15.3 Factors to motivate implementation of risk framework: Maximise profit.	Q15_03	0.3341	0.8224
15.4 Factors to motivate implementation of risk framework: Reliable business information.	Q15_04	0.4047	0.8209
15.5 Factors to motivate implementation of risk framework: Safeguarding of assets.	Q15_05	0.3213	0.8227
15.6 Factors to motivate implementation of risk framework: Regulatory compliance.	Q15_06	0.4449	0.8200
15.7 Factors to motivate implementation of risk framework: Fraud prevention / detection.	Q15_07	0.4000	0.8210
15.8 Factors to motivate implementation of risk framework: Continuity of operations.	Q15_08	0.2222	0.8248
15.9 Factors to motivate implementation of risk framework: Internal compliance.	Q15_09	0.3885	0.8212
15.10 Factors to motivate implementation of risk framework: Minimise the occurrence of unforeseen events.	Q15_10	0.4104	0.8207
15.11 Factors to motivate implementation of risk framework: None.	Q15_11n	0.2854	0.8235
16. How would you characterise the status of your risk management framework?	Q16	0.2764	0.8237
17.1 Functions where formal risk identification and assessment is taking place: Finance.	Q17_01	0.4554	0.8198
17.2 Functions where formal risk identification and assessment is taking place: Sales / Marketing.	Q17_02	0.2180	0.8249
17.3 Functions where formal risk identification and assessment is taking place: Human Resources.	Q17_03	0.3521	0.8220
17.4 Functions where formal risk identification and assessment is taking place: Operational.	Q17_04	0.3124	0.8229
17.5 Functions where formal risk identification and assessment is taking place: Procurement.	Q17_05	0.3857	0.8213
17.6 Functions where formal risk identification and assessment is taking place: None.	Q17_06n	0.4585	0.8197
17.7 Functions where formal risk identification and assessment is taking place: Other.	Q17_07	Left out due to only “No” responses	

Statements	Variable nr.	Correlation with total	Cronbach Alpha coefficient
18.1 Action engaged in when risks are identified: Take out insurance.	Q18_01	0.0797	0.8279
18.2 Action engaged in when risks are identified: Improve internal controls.	Q18_02	0.2640	0.8239
18.3 Action engaged in when risks are identified: Do not engage in the identified activity.	Q18_03	-0.0694	0.8310
18.4 Action engaged in when risks are identified: Other.	Q18_04	0.1400	0.8266
19. How do you implement or plan to implement risk management activities?	Q19	0.2478	0.8243
20.1 Obstacles for implementing RMF: No obstacles.	Q20_01n	0.3434	0.8222
20.2 Obstacles for implementing RMF: Not perceived as a priority by management.	Q20_02	0.1530	0.8263
20.3 Obstacles for implementing RMF: Lack of formalised processes.	Q20_03	0.3796	0.8214
20.4 Obstacles for implementing RMF: Lack of technology.	Q20_04	0.2831	0.8235
20.5 Obstacles for implementing RMF: Lack of intellectual capital.	Q20_05	0.3801	0.8214
20.6 Obstacles for implementing RMF: Benefit does not justify the effort.	Q20_06	0.1489	0.8264
20.7 Obstacles for implementing RMF: Cost.	Q20_07	0.4149	0.8206
20.8 Obstacles for implementing RMF: Lack of skills.	Q20_08	0.1942	0.8254
Cronbach's Coefficient Alpha for standardised variables			**0.8267**
Cronbach's Coefficient Alpha for raw variables			**0.7599**

APPENDIX C2

Table 6.2: Descriptive statistics for all the variables.

Variables	Categories	Frequency	Percentage out of total
Biographic information of companies			
1. What is the annual turnover of your business?	>R25million	5	3.2%
	>R20million–R25million	2	1.3%
	>R15million–R20million	2	1.3%
	>R10million–R15million	8	5.1%
	>R5million–R10million	7	4.4%
	>R1million–R5million	24	15.2%
	>R500 000–R1 million	17	10.8%
	>R300 000–R500 000	14	8.9%
	>R150 000–R300 000	33	20.9%
	R100 000–R150 000	22	13.9%
	<R100 000	24	15.2%
2. How many permanent employees does your business employ?	>100	3	1.9%
	50-100	3	1.9%
	21-49	23	14.6%
	11-20	27	17.1%
	6-10	33	20.9%
	1-5	69	43.7%
3. What type of entity is your business?	Sole proprietorship	61	38.6%
	Partnership	30	19.0%
	Close corporation	50	31.6%
	Limited company	15	9.5%
	Other	2	1.3%
4. What is the age of your business?	> 20 years	9	5.7%
	11 – 20 years	29	18.4%
	6 – 10 years	42	26.6%
	3 – 5 years	48	30.4%
	< 3 years	30	19.0%
5.1 What is the highest qualification the owner holds?	Post graduate degree	21	13.3%
	Degree	27	17.1%
	Diploma	41	26.0%
	Post matriculation	18	11.4%
	Matriculation Certificate	36	22.8%
	Grade 8 – Grade 10	5	3.2%
	Grade 7	1	0.6%
	None	2	1.3%
	Unknown	7	4.4%

Variables		Categories	Frequency	Percentage out of total
5.2	What is the highest qualification the executive manager holds?	Post graduate degree	15	9.5%
		Degree	21	13.3%
		Diploma	50	31.6%
		Post matriculation	15	9.5%
		Matriculation Certificate	33	20.9%
		Grade 8 – Grade 10	3	1.9%
		Grade 7	1	0.6%
		None	9	5.7%
		Unknown	11	7.0%
Measuring instrument				
6.1	Area receiving support from external consultants: Financial Management.	Yes	62	39.2%
		No	96	60.8%
6.2	Area receiving support from external consultants: Marketing Management.	Yes	56	35.4%
		No	102	64.6%
6.3	Area receiving support from external consultants: Operational Management.	Yes	29	18.4%
		No	129	81.6%
6.4	Area receiving support from external consultants: Administrative Management.	Yes	29	18.4%
		No	129	81.6%
6.5	Area receiving support from external consultants: Information Technology.	Yes	52	32.9%
		No	106	67.1%
6.6	Area receiving support from external consultants: Human Resource Management.	Yes	25	15.8%
		No	133	84.2%
6.7	Area receiving support from external consultants: Public Relation Management.	Yes	25	15.8%
		No	133	84.2%
6.8	Area receiving support from external consultants: None.	Yes	52	32.9%
		No	106	67.1%
6.9	Area receiving support from external consultants: Other.	Yes	3	1.9%
		No	155	98.1%
7.1.1	Business experienced no problems.	Yes	61	38.6%
		No	97	61.3%
7.2.1	Business experience problems due to: Default payments by debtors.	Yes	35	22.2%
		No	123	77.8%
7.2.2	Business experience problems due to: Overspending or excessive expenditure.	Yes	44	27.8%
		No	114	72.2%
7.2.3	Business experience problems due to: Theft of business resources.	Yes	61	38.6%
		No	97	61.4%
7.2.4	Business experience problems due to: Information Technology inefficiencies.	Yes	30	19.0%
		No	128	81.0%
7.2.5	Business experience problems due to: Personnel – lack of skill.	Yes	32	20.2%
		No	126	79.8%

Variables	Categories	Frequency	Percentage out of total
7.2.6 Business experience problems due to: Operational problems.	Yes	36	22.8%
	No	122	77.2%
7.2.7 Business experience problems due to: Catastrophic event.	Yes	14	8.9%
	No	144	91.1%
7.2.8 Business experience problems due to: Other.	Yes	7	4.4%
	No	151	95.6%
8. Are your business objectives and strategies clearly defined to help determine which activities are critical for the survival of your business?	Yes	135	85.4%
	No	23	14.6%
9.1 Management risk.	Most important – 5	38	24.0%
	Important – 4	27	17.1%
	Less important – 3	35	22.2%
	Not so important – 2	33	20.9%
	Least important – 1	24	15.2%
	Unknown	1	0.6%
9.2 Commercial risk.	Most important – 5	35	22.2%
	Important – 4	31	19.6%
	Less important – 3	43	27.2%
	Not so important – 2	28	17.7%
	Least important – 1	20	12.7%
	Unknown	1	0.6%
9.3 Technological risk.	Most important – 5	37	23.4%
	Important – 4	28	17.7%
	Less important – 3	25	15.8%
	Not so important – 2	30	19.0%
	Least important – 1	37	23.4%
	Unknown	1	0.6%
9.4 Financial risk.	Most important – 5	52	32.9%
	Important – 4	29	18.4%
	Less important – 3	32	20.2%
	Not so important – 2	17	10.8%
	Least important – 1	27	17.1%
	Unknown	1	0.6%
9.5 Entrepreneurial risk.	Most important – 5	28	17.7%
	Important – 4	23	14.6%
	Less important – 3	28	17.7%
	Not so important – 2	33	20.9%
	Least important – 1	45	28.5%
	Unknown	1	0.6%
10. Do you have a clear understanding of the	Yes	138	87.3%

Variables		Categories	Frequency	Percentage out of total
	risks that have an impact on your business structure and processes?	No	20	12.7%
11.	To what extent are risks discussed in your business strategic planning?	High	41	26.0%
		Medium	55	34.8%
		Low	30	19.0%
		Do not know	14	8.9%
		Not discussed	18	11.4%
12.	To what extent are risks discussed in your business operational planning?	High	40	25.3%
		Medium	64	40.5%
		Low	35	22.2%
		Do not know	7	4.4%
		Not discussed	12	7.6%
13.	To what extent are risks discussed in your business financial planning?	High	66	41.8%
		Medium	56	35.4%
		Low	22	13.9%
		Do not know	7	4.4%
		Not discussed	7	4.4%
14.	Would you be interested in a risk framework?	Yes	97	61.4%
		No	61	38.6%
15.1	Factors to motivate implementation of risk framework: Improved customer service.	Yes	130	82.3%
		No	28	17.7%
15.2	Factors to motivate implementation of risk framework: Minimised costs.	Yes	123	77.8%
		No	35	22.2%
15.3	Factors to motivate implementation of risk framework: Maximise profit.	Yes	139	88.0%
		No	19	12.0%
15.4	Factors to motivate implementation of risk framework: Reliable business information.	Yes	93	58.9%
		No	65	41.1%
15.5	Factors to motivate implementation of risk framework: Safeguarding of assets.	Yes	112	70.9%
		No	46	29.1%
15.6	Factors to motivate implementation of risk framework: Regulatory compliance.	Yes	84	53.2%
		No	74	46.8%
15.7	Factors to motivate implementation of risk framework: Fraud prevention / detection.	Yes	109	69.0%
		No	49	31.0%
15.8	Factors to motivate implementation of risk framework: Continuity of operations.	Yes	103	65.2%
		No	55	34.8%
15.9	Factors to motivate implementation of risk framework: Internal compliance.	Yes	79	50.0%
		No	79	50.0%
15.10	Factors to motivate implementation of risk framework: Minimise the occurrence of unforeseen events.	Yes	105	66.5%
		No	53	33.5%
15.11	Factors to motivate implementation of risk	Yes	6	3.8%

Variables		Categories	Frequency	Percentage out of total
	framework: None.	No	152	96.2%
16.	How would you characterise the status of your risk management framework?	Complete risk management framework in place.	19	12.0%
		Partial risk management framework in place.	31	19.6%
		Do not have a risk management framework in place but plan to implement one.	44	27.8%
		Investigate the concept of risk management framework.	26	16.5%
		Do not have a risk management framework in place and do not plan to implement one.	38	24.0%
17.1	Functions where formal risk identification and assessment is taking place: Finance.	Yes	116	73.4%
		No	42	26.6%
17.2	Functions where formal risk identification and assessment is taking place: Sales / Marketing.	Yes	87	55.1%
		No	71	44.9%
17.3	Functions where formal risk identification and assessment is taking place: Human Resources.	Yes	39	24.7%
		No	119	75.3%
17.4	Functions where formal risk identification and assessment is taking place: Operational.	Yes	89	56.3%
		No	69	43.7%
17.5	Functions where formal risk identification and assessment is taking place: Procurement.	Yes	56	35.4%
		No	102	64.6%
17.6	Functions where formal risk identification and assessment is taking place: None.	Yes	20	12.7%
		No	138	87.3%
17.7	Functions where formal risk identification and assessment is taking place: Other.	Yes	0	0.0%
		No	158	100.0%
18.1	Action engaged in when risks are identified: Take out insurance.	Yes	92	58.2%
		No	66	41.8%
18.2	Action engaged in when risks are identified: Improve internal controls.	Yes	120	76.0%
		No	38	24.0%
18.3	Action engaged in when risks are identified: Do not engage in the identified activity.	Yes	32	20.2%
		No	126	79.8%
18.4	Action engaged in when risks are identified: Other.	Yes	3	1.9%
		No	155	98.1%

Variables		Categories	Frequency	Percentage out of total
19.	How do you implement or plan to implement risk management activities?	Holistically	59	37.3%
		Incrementally – by department	17	10.8%
		Incrementally – By type of risk	45	28.5%
		Incrementally – Other	2	1.3%
		Not applicable	35	22.2%
20.1	Barriers for implementing RMF: No barriers.	Yes	49	31.0%
		No	109	69.0%
20.2	Barriers for implementing RMF: Not perceived as a priority by management.	Yes	36	22.8%
		No	122	77.2%
20.3	Barriers for implementing RMF: Lack of formalised processes.	Yes	51	32.3%
		No	107	67.7%
20.4	Barriers for implementing RMF: Lack of technology.	Yes	45	28.5%
		No	113	71.5%
20.5	Barriers for implementing RMF: Lack of intellectual capital.	Yes	47	29.8%
		No	111	70.2%
20.6	Barriers for implementing RMF: Benefit does not justify the effort.	Yes	36	22.8%
		No	122	77.2%
20.7	Barriers for implementing RMF: Cost.	Yes	70	44.3%
		No	88	55.7%
20.8	Barriers for implementing RMF: Lack of skills.	Yes	52	32.9%
		No	106	67.1%
21.	Would you like to receive feedback on this study?	Yes	62	39.2%

APPENDIX D

Univariate statistics

```
                    The UNIVARIATE Procedure
                   Variable:  Q09_1  (Q09_1)

N                         157    Sum Weights                157
Mean               2.85987261    Sum Observations           449
Std Deviation      1.39806918    Variance            1.95459742
Skewness           0.05373159    Kurtosis            -1.2648661
Uncorrected SS           1589    Corrected SS        304.917197
Coeff Variation     48.885715    Std Error Mean      0.11157807

                   Basic Statistical Measures
         Location                    Variability
     Mean     2.859873     Std Deviation            1.39807
     Median   3.000000     Variance                 1.95460
     Mode     1.000000     Range                    4.00000
                           Interquartile Range      2.00000

                    Quantiles (Definition 5)
                     Quantile      Estimate
                     100% Max             5
                     99%                  5
                     95%                  5
                     90%                  5
                     75% Q3               4
                     50% Median           3
                     25% Q1               2
                     10%                  1
                     5%                   1
                     1%                   1
                     0% Min               1


                   Variable:  Q09_2  (Q09_2)
N                         157    Sum Weights                157
Mean               2.78980892    Sum Observations           438
Std Deviation      1.32060518    Variance            1.74399804
Skewness           0.14099908    Kurtosis            -1.0684798
Uncorrected SS           1494    Corrected SS        272.063694
Coeff Variation     47.336761    Std Error Mean      0.10539577

                   Basic Statistical Measures
         Location                    Variability
     Mean     2.789809     Std Deviation            1.32061
     Median   3.000000     Variance                 1.74400
     Mode     3.000000     Range                    4.00000
                           Interquartile Range      2.00000

                    Quantiles (Definition 5)
                     Quantile      Estimate
                     100% Max             5
                     99%                  5
                     95%                  5
                     90%                  5
                     75% Q3               4
                     50% Median           3
                     25% Q1               2
                     10%                  1
                     5%                   1
                     1%                   1
                     0% Min               1


                   Variable:  Q09_3  (Q09_3)
N                         157    Sum Weights                157
Mean               3.01273885    Sum Observations           473
Std Deviation      1.50634241    Variance            2.26906745
Skewness           -0.0218991    Kurtosis            -1.4512878
Uncorrected SS           1779    Corrected SS        353.974522
Coeff Variation    49.9991032    Std Error Mean      0.12021921

                   Basic Statistical Measures
         Location                    Variability
     Mean     3.012739     Std Deviation            1.50634
     Median   3.000000     Variance                 2.26907
     Mode     1.000000     Range                    4.00000
                           Interquartile Range      2.00000

NOTE: The mode displayed is the smallest of 2 modes with a count of 37.

                    Quantiles (Definition 5)
                     Quantile      Estimate
                     100% Max             5
                     99%                  5
                     95%                  5
                     90%                  5
                     75% Q3               4
                     50% Median           3
                     25% Q1               2
                     10%                  1
                     5%                   1
                     1%                   1
                     0% Min               1
```

Variable: Q09_4 (Q09_4)

N	157	Sum Weights	157
Mean	2.60509554	Sum Observations	409
Std Deviation	1.47090571	Variance	2.16356361
Skewness	0.40301259	Kurtosis	-1.2051169
Uncorrected SS	1403	Corrected SS	337.515924
Coeff Variation	56.4626398	Std Error Mean	0.11739106

Basic Statistical Measures

Location		Variability	
Mean	2.605096	Std Deviation	1.47091
Median	2.000000	Variance	2.16356
Mode	1.000000	Range	4.00000
		Interquartile Range	3.00000

Quantiles (Definition 5)

Quantile	Estimate
100% Max	5
99%	5
95%	5
90%	5
75% Q3	4
50% Median	2
25% Q1	1
10%	1
5%	1
1%	1
0% Min	1

Variable: Q09_5 (Q09_5)

N	157	Sum Weights	157
Mean	3.28025478	Sum Observations	515
Std Deviation	1.46687525	Variance	2.15172301
Skewness	-0.2873294	Kurtosis	-1.3011575
Uncorrected SS	2025	Corrected SS	335.66879
Coeff Variation	44.718333	Std Error Mean	0.11706939

Basic Statistical Measures

Location		Variability	
Mean	3.280255	Std Deviation	1.46688
Median	3.000000	Variance	2.15172
Mode	5.000000	Range	4.00000
		Interquartile Range	3.00000

Quantiles (Definition 5)

Quantile	Estimate
100% Max	5
99%	5
95%	5
90%	5
75% Q3	5
50% Median	3
25% Q1	2
10%	1
5%	1
1%	1
0% Min	1

Variable: Q11 (Q11)

N	158	Sum Weights	158
Mean	2.44936709	Sum Observations	387
Std Deviation	1.2796669	Variance	1.63754737
Skewness	0.69597004	Kurtosis	-0.5195441
Uncorrected SS	1205	Corrected SS	257.094937
Coeff Variation	52.2447984	Std Error Mean	0.10180483

Basic Statistical Measures

Location		Variability	
Mean	2.449367	Std Deviation	1.27967
Median	2.000000	Variance	1.63755
Mode	2.000000	Range	4.00000
		Interquartile Range	2.00000

Quantiles (Definition 5)

Quantile	Estimate
100% Max	5
99%	5
95%	5
90%	5
75% Q3	3
50% Median	2
25% Q1	1
10%	1
5%	1
1%	1
0% Min	1

Variable: Q12 (Q12)

N	158	Sum Weights	158
Mean	2.28481013	Sum Observations	361
Std Deviation	1.12352818	Variance	1.26231557
Skewness	0.91889536	Kurtosis	0.39445227
Uncorrected SS	1023	Corrected SS	198.183544
Coeff Variation	49.1738095	Std Error Mean	0.0893831

Basic Statistical Measures

Location	Variability

Location		Variability	
Mean	2.284810	Std Deviation	1.12353
Median	2.000000	Variance	1.26232
Mode	2.000000	Range	4.00000
		Interquartile Range	2.00000

Quantiles (Definition 5)

Quantile	Estimate
100% Max	5
99%	5
95%	5
90%	4
75% Q3	3
50% Median	2
25% Q1	1
10%	1
5%	1
1%	1
0% Min	1

Variable: Q13 (Q13)

N	158	Sum Weights	158
Mean	1.94303797	Sum Observations	307
Std Deviation	1.06623733	Variance	1.13686205
Skewness	1.23219328	Kurtosis	1.12127379
Uncorrected SS	775	Corrected SS	178.487342
Coeff Variation	54.8747552	Std Error Mean	0.08482529

Basic Statistical Measures

Location		Variability	
Mean	1.943038	Std Deviation	1.06624
Median	2.000000	Variance	1.13686
Mode	1.000000	Range	4.00000
		Interquartile Range	1.00000

Quantiles (Definition 5)

Quantile	Estimate
100% Max	5
99%	5
95%	4
90%	3
75% Q3	2
50% Median	2
25% Q1	1
10%	1
5%	1
1%	1
0% Min	1

Variable: Q16 (Q16)

N	158	Sum Weights	158
Mean	3.20886076	Sum Observations	507
Std Deviation	1.33093424	Variance	1.77138596
Skewness	-0.0785231	Kurtosis	-1.1181766
Uncorrected SS	1905	Corrected SS	278.107595
Coeff Variation	41.4768462	Std Error Mean	0.10588344

Basic Statistical Measures

Location		Variability	
Mean	3.208861	Std Deviation	1.33093
Median	3.000000	Variance	1.77139
Mode	3.000000	Range	4.00000
		Interquartile Range	2.00000

Quantiles (Definition 5)

Quantile	Estimate
100% Max	5
99%	5
95%	5
90%	5
75% Q3	4
50% Median	3
25% Q1	2
10%	1
5%	1
1%	1
0% Min	1

Variable: Q19 (Q19)

N	158	Sum Weights	158
Mean	2.60126582	Sum Observations	411
Std Deviation	1.53490128	Variance	2.35592195
Skewness	0.43791044	Kurtosis	-1.201017
Uncorrected SS	1439	Corrected SS	369.879747
Coeff Variation	59.0059375	Std Error Mean	0.12211019

Basic Statistical Measures

Location		Variability	
Mean	2.601266	Std Deviation	1.53490
Median	3.000000	Variance	2.35592
Mode	1.000000	Range	4.00000
		Interquartile Range	2.00000

Quantiles (Definition 5)

Quantile	Estimate
100% Max	5
99%	5
95%	5

90%	5
75% Q3	3
50% Median	3
25% Q1	1
10%	1
5%	1
1%	1
0% Min	

APPENDIX E

Factor analysis

The FACTOR Procedure

Means and Standard Deviations from 157 Observations

Variable	Mean	Std Dev
Q06_01	1.6050955	0.4903944
Q06_02	1.6433121	0.4805544
Q06_03	1.8216561	0.3840270
Q06_04	1.8152866	0.3893067
Q06_05	1.6687898	0.4721546
Q06_06	1.8407643	0.3670666
Q06_07	1.8471338	0.3610101
q06_08n	1.3312102	0.4721546
Q06_09	1.9808917	0.1373437
q07_1_1n	1.3885350	0.4889770
Q07_2_01	1.7770701	0.4175436
Q07_2_02	1.7197452	0.4505608
Q07_2_03	1.6114650	0.4889770
Q07_2_04	1.8089172	0.3944122
Q07_2_05	1.8025478	0.3993503
Q07_2_06	1.7707006	0.4217274
Q07_2_07	1.9108280	0.2859038
Q07_2_08	1.9617834	0.1923322
Q08	1.1401274	0.3482299
Q10	1.1273885	0.3344746
Q14	1.3885350	0.4889770
Q15_01	1.1783439	0.3840270
Q15_02	1.2165605	0.4132186
Q15_03	1.1210191	0.3271932
Q15_04	1.4076433	0.4929687
Q15_05	1.2866242	0.4536314
Q15_06	1.4649682	0.5003673
Q15_07	1.3121019	0.4648339
Q15_08	1.3439490	0.4765444
Q15_09	1.4968153	0.5015898
Q15_10	1.3312102	0.4721546
q15_11n	1.0382166	0.1923322
Q18_01	1.4140127	0.4941269
Q18_02	1.2420382	0.4296879
Q18_03	1.7961783	0.4041270
Q18_04	1.9808917	0.1373437
q20_1n	1.3121019	0.4648339
Q20_2	1.7707006	0.4217274
Q20_3	1.6815287	0.4673742
Q20_4	1.7133758	0.4536314
Q20_5	1.7006369	0.4594446
Q20_6	1.7770701	0.4175436
Q20_7	1.5541401	0.4986508
Q20_8	1.6751592	0.4698139
Q21	1.6050955	0.4903944
Q11	2.4458599	1.2829998
Q12	2.2802548	1.1256588
Q13	1.9363057	1.0662751
Q16	3.2101911	1.3350879
Q09_1	2.8598726	1.3980692
Q09_2	2.7898089	1.3206052
Q09_3	3.0127389	1.5063424
Q09_4	2.6050955	1.4709057
Q09_5	3.2802548	1.4668753
Q19	2.6114650	1.5344325

Initial Factor Method: Principal Factors

Prior Communality Estimates: SMC

Q06_01	Q06_02	Q06_03	Q06_04	Q06_05	Q06_06	Q06_07	q06_08n	Q06_09	q07_1_1n
0.61475451	0.58186603	0.38180336	0.57786324	0.58303629	0.50854588	0.57354536	0.70083573	0.40749733	0.83788315
Q07_2_01	Q07_2_02	Q07_2_03	Q07_2_04	Q07_2_05	Q07_2_06	Q07_2_07	Q07_2_08	Q08	Q10
0.55995411	0.59471728	0.68312436	0.50309270	0.44616137	0.55957197	0.35755205	0.45858318	0.44612556	0.45053618
Q14	Q15_01	Q15_02	Q15_03	Q15_04	Q15_05	Q15_06	Q15_07	Q15_08	Q15_09
0.55356925	0.53478371	0.52551933	0.69712782	0.60218200	0.57323980	0.67945037	0.65222347	0.53504778	0.60582274
Q15_10	q15_11n	Q18_01	Q18_02	Q18_03	Q18_04	q20_1n	Q20_2	Q20_3	Q20_4
0.58876803	0.65022822	0.37967307	0.58851189	0.47100695	0.32953024	0.71186481	0.50287015	0.50672253	0.56892195
Q20_5	Q20_6	Q20_7	Q20_8	Q21	Q11	Q12	Q13	Q16	Q09_1
0.57176665	0.56446152	0.67802473	0.51681565	0.38011928	0.75118465	0.73239983	0.70162144	0.58117439	0.41987492

Q09_2	Q09_3	Q09_4	Q09_5	Q19
0.37733713	0.41772727	0.53238131	0.33489663	0.50734904

Eigenvalues of the Reduced Correlation Matrix: Total = 30.1512482 Average = 0.54820451

	Eigenvalue	Difference	Proportion	Cumulative
1	5.53635963	1.08048359	0.1836	0.1836
2	4.45587604	1.53063612	0.1478	0.3314
3	2.92523992	0.55969321	0.0970	0.4284
4	2.36554671	0.36516931	0.0785	0.5069
5	2.00037740	0.18134189	0.0663	0.5732
6	1.81903551	0.44695557	0.0603	0.6336
7	1.37207994	0.09225729	0.0455	0.6791
8	1.27982265	0.10026802	0.0424	0.7215
9	1.17955464	0.14425904	0.0391	0.7606
10	1.03529559	0.16367856	0.0343	0.7950
11	0.87161704	0.02701864	0.0289	0.8239
12	0.84459840	0.06818017	0.0280	0.8519
13	0.77641823	0.01617183	0.0258	0.8776
14	0.76024640	0.01923042	0.0252	0.9029
15	0.74101598	0.06634872	0.0246	0.9274

16	0.67466725	0.06996161	0.0224	0.9498
17	0.60470564	0.09865018	0.0201	0.9699
18	0.50605546	0.02505949	0.0168	0.9866
19	0.48099597	0.01158441	0.0160	1.0026
20	0.46941156	0.04155474	0.0156	1.0182
21	0.42785682	0.06432468	0.0142	1.0324
22	0.36353214	0.01495761	0.0121	1.0444
23	0.34857453	0.02362951	0.0116	1.0560
24	0.32494502	0.04718026	0.0108	1.0667
25	0.27776476	0.02324113	0.0092	1.0760
26	0.25452363	0.02281360	0.0084	1.0844
27	0.23171003	0.06205229	0.0077	1.0921
28	0.16965775	0.02281623	0.0056	1.0977
29	0.14684151	0.01700830	0.0049	1.1026
30	0.12983322	0.04662883	0.0043	1.1069
31	0.08320439	0.01237389	0.0028	1.1097
32	0.07083050	0.01968057	0.0023	1.1120
33	0.05114993	0.02806458	0.0017	1.1137
34	0.02308535	0.02471396	0.0008	1.1145
35	-.00162861	0.02944230	-0.0001	1.1144
36	-.03107091	0.01038948	-0.0010	1.1134
37	-.04146039	0.01692932	-0.0014	1.1120
38	-.05838972	0.01052565	-0.0019	1.1101
39	-.06891537	0.01346036	-0.0023	1.1078
40	-.08237572	0.02321804	-0.0027	1.1050
41	-.10559376	0.00851275	-0.0035	1.1015
42	-.11410651	0.02436987	-0.0038	1.0978
43	-.13847638	0.01194053	-0.0046	1.0932
44	-.15041691	0.00922628	-0.0050	1.0882
45	-.15964319	0.02427440	-0.0053	1.0829
46	-.18391759	0.02347356	-0.0061	1.0768
47	-.20739116	0.00925010	-0.0069	1.0699
48	-.21664125	0.01807757	-0.0072	1.0627
49	-.23471883	0.01335558	-0.0078	1.0549
50	-.24807440	0.00540054	-0.0082	1.0467
51	-.25347495	0.00669199	-0.0084	1.0383
52	-.26016694	0.01726524	-0.0086	1.0297
53	-.27743218	0.02437342	-0.0092	1.0205
54	-.30180560	0.01367539	-0.0100	1.0105
55	-.31548099		-0.0105	1.0000

8 factors will be retained by the NFACTOR criterion.

Factor Pattern

		Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8
Q20_7	Q20_7	56 *	-17	19	41 *	7	0	-9	-4
Q15_02	Q15_02	54 *	-2	-19	5	-23	-16	17	0
Q15_10	Q15_10	54 *	-2	-31	-7	-1	9	2	-14
Q15_07	Q15_07	53 *	3	-28	-15	5	19	-23	-31
Q20_5	Q20_5	52 *	-20	14	33	-6	-6	-7	4
Q20_3	Q20_3	51 *	-21	9	24	14	3	11	15
Q15_04	Q15_04	50 *	6	-35	2	-5	11	2	5
Q15_06	Q15_06	49 *	14	-31	-5	6	41 *	-21	-18
Q15_05	Q15_05	47 *	0	-38	-11	-11	-3	-15	-18
Q15_03	Q15_03	47 *	7	-20	-5	-21	-46 *	16	26
Q07_2_03	Q07_2_03	46 *	-30	23	-36	10	-11	-9	-19
q15_11n		45 *	-1	-37	-16	-10	-32	-1	24
Q15_09	Q15_09	43 *	9	-42 *	-14	6	33	-7	8
Q15_01	Q15_01	43 *	4	-27	-8	-28	-26	12	11
Q14	Q14	42 *	11	18	-19	16	-13	-6	8
Q07_2_02	Q07_2_02	39	-22	17	-36	26	2	18	-13
Q20_8	Q20_8	38	-36	16	35	0	-1	-7	6
Q20_4	Q20_4	36	-7	15	32	15	-24	-20	16
Q07_2_04	Q07_2_04	32	-6	21	-29	23	-3	-4	8
Q07_2_05	Q07_2_05	29	-26	26	-19	5	-14	-21	12
Q07_2_08	Q07_2_08	-21	9	8	2	21	8	13	-3
Q11	Q11	7	73 *	-18	10	30	-5	-1	0
Q12	Q12	4	64 *	-18	11	42 *	4	-1	23
Q13	Q13	15	62 *	-12	9	36	-12	12	7
Q16	Q16	11	55 *	5	-22	7	-13	-23	11
q06_08n		35	52 *	40 *	0	-28	-9	10	-15
Q18_02	Q18_02	14	48 *	6	28	5	-19	12	-32

Q06_07	Q06_07	11	45 *	24	-21	-9	24	-4	19
Q06_02	Q06_02	24	43 *	41 *	-14	-13	-4	-13	-11
Q19	Q19	11	38	17	3	16	-1	-18	1
Q06_05	Q06_05	29	38	27	8	-31	-11	2	-14
Q06_06	Q06_06	2	35	28	-7	-20	27	-4	14
Q06_03	Q06_03	8	31	27	-6	-23	17	-6	16
Q18_04	Q18_04	12	21	-8	-3	-16	15	11	2
Q07_2_06	Q07_2_06	16	-28	25	-19	10	13	-3	23
q07_1_1n		40 *	-36	44 *	-38	34	-2	14	-9
Q15_08	Q15_08	39	-12	-41 *	-9	-8	22	3	15
q20_1n		48 *	-19	28	53 *	8	14	10	8
Q08	Q08	3	28	5	41 *	20	-7	-14	-16
Q20_2	Q20_2	18	-6	5	37	-4	29	4	6
Q20_6	Q20_6	29	-27	16	33	-12	9	-6	-3
Q10	Q10	-1	29	-2	10	30	8	-5	-11
Q21	Q21	19	20	0	4	25	3	-2	13
Q06_01	Q06_01	19	34	29	1	-49 *	8	9	-17
Q06_04	Q06_04	14	30	31	-22	-21	34	9	31
Q18_03	Q18_03	-1	-12	7	11	11	33	9	15
Q07_2_07	Q07_2_07	19	-16	14	-14	16	25	3	10
Q09_5	Q09_5	3	-12	-13	2	-3	13	4	-9
Q09_4	Q09_4	15	20	-10	-2	4	1	56 *	6
Q09_1	Q09_1	8	10	-12	3	14	27	37	-16
Q09_2	Q09_2	7	-10	0	9	-14	21	33	-11
Q09_3	Q09_3	18	4	7	-19	13	-14	24	-17
Q06_09	Q06_09	1	0	0	8	16	-19	19	13
Q18_01	Q18_01	7	5	-10	-4	-6	5	-23	-16
Q07_2_01	Q07_2_01	16	-3	26	-14	20	-6	20	-27

Printed values are multiplied by 100 and rounded to the nearest integer. Values greater than 0.4 are flagged by an '*'.

Variance Explained by Each Factor

Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8
5.5363596	4.4558760	2.9252399	2.3655467	2.0003774	1.8190355	1.3720799	1.2798227

Final Communality Estimates: Total = 21.754338

Q06_01	Q06_02	Q06_03	Q06_04	Q06_05	Q06_06	Q06_07	q06_08n	Q06_09	q07_1_1n
0.51449901	0.47533985	0.28927262	0.52426014	0.43234313	0.33655303	0.42111095	0.67215662	0.12247215	0.77749138
Q07_2_01	**Q07_2_02**	**Q07_2_03**	**Q07_2_04**	**Q07_2_05**	**Q07_2_06**	**Q07_2_07**	**Q07_2_08**	**Q08**	**Q10**
0.26887363	0.47566443	0.55576299	0.29032801	0.34430809	0.28511838	0.19752294	0.12671245	0.34091432	0.20291009
Q14	**Q15_01**	**Q15_02**	**Q15_03**	**Q15_04**	**Q15_05**	**Q15_06**	**Q15_07**	**Q15_08**	**Q15_09**
0.31130900	0.43518837	0.43599957	0.61950424	0.39092965	0.44415085	0.60954981	0.57732730	0.41926774	0.51191821
Q15_10	**q15_11n**	**Q18_01**	**Q18_02**	**Q18_03**	**Q18_04**	**q20_1n**	**Q20_2**	**Q20_3**	**Q20_4**
0.41463357	0.53446492	0.10653480	0.48610286	0.18354632	0.12525645	0.66583490	0.26599155	0.43528062	0.40804539
Q20_5	**Q20_6**	**Q20_7**	**Q20_8**	**Q21**	**Q11**	**Q12**	**Q13**	**Q16**	**Q09_1**
0.45715451	0.31664071	0.57204874	0.42990611	0.15332176	0.67321050	0.68065991	0.59655663	0.45877227	0.28226016

Q09_2	Q09_3	Q09_4	Q09_5	Q19
0.20640777	0.19659060	0.39113193	0.05918825	0.24603760

Prerotation Method: Varimax

Orthogonal Transformation Matrix

	1	2	3	4	5	6	7	8
1	0.53408	0.13912	0.19386	0.44224	0.50045	0.45639	0.02692	0.05272
2	-0.29170	0.68436	0.54818	-0.21885	0.04727	0.03445	0.29995	0.06905
3	0.29835	-0.12151	0.50755	0.43556	-0.40310	-0.49544	0.11619	-0.16569
4	0.72109	0.18504	-0.17979	-0.55633	-0.13671	-0.16076	0.21552	

								0.11393
5	0.02605	0.65687	-0.48283	0.41827	-0.32155	-0.06518	-0.22827	0.00279
6	0.08866	-0.06772	0.31889	-0.12958	-0.51542	0.45700	-0.49646	0.38482
7	-0.06605	-0.04673	-0.03200	0.15616	0.22054	-0.39053	0.02338	0.87541
8	0.08823	0.15822	0.19011	-0.20293	0.38528	-0.39193	-0.74178	-0.19384

Rotated Factor Pattern

		Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8
q20_1n		79 *	5	6	9	0	-2	-4	15
Q20_7	Q20_7	71 *	6	0	17	8	14	9	-4
Q20_5	Q20_5	62 *	-5	2	12	20	9	6	-6
Q20_8	Q20_8	61 *	-13	-10	10	8	2	-5	-7
Q20_3	Q20_3	55 *	7	-5	22	19	4	-15	11
Q20_6	Q20_6	52 *	-19	1	1	-1	8	2	0
Q20_4	Q20_4	50 *	20	-6	9	17	-7	3	-27
Q20_2	Q20_2	42 *	1	8	-15	-9	9	-10	18
Q12	Q12	-10	79 *	10	-14	4	1	-9	5
Q11	Q11	-15	75 *	15	-13	6	9	18	7
Q13	Q13	-7	73 *	8	0	14	-2	12	13
Q16	Q16	-23	43 *	35	6	13	6	9	-27
Q10	Q10	-2	39	-1	0	-19	8	7	5
Q08	Q08	24	38	-3	-15	-17	0	29	-6
Q19	Q19	4	38	24	6	-8	2	10	-15
Q21	Q21	9	35	5	8	5	4	-9	-1
Q06_04	Q06_04	-3	4	66 *	7	2	-3	-27	10
q06_08n		12	15	63 *	16	14	-3	43 *	7
Q06_01	Q06_01	7	-13	59 *	-4	6	5	34	12
Q06_07	Q06_07	-11	21	59 *	6	-2	4	-12	-1
Q06_06	Q06_06	-3	7	56 *	-6	-11	0	-7	1
Q06_02	Q06_02	1	16	55 *	22	-1	3	28	-15
Q06_03	Q06_03	2	4	53 *	-4	-1	-2	-4	-4
Q06_05	Q06_05	15	6	47 *	3	15	1	40	1
Q18_04	Q18_04	-4	5	22	-9	11	14	0	18
q07_1_1n		17	-11	-2	85 *	-4	-4	-13	1
Q07_2_02	Q07_2_02	5	-4	-4	66 *	6	11	-8	13
Q07_2_03	Q07_2_03	12	-19	-1	65 *	11	20	5	-16
Q07_2_04	Q07_2_04	6	9	8	48 *	8	4	-15	-12
Q07_2_01	Q07_2_01	3	3	0	45 *	-9	-5	18	15
Q14	Q14	11	21	17	40 *	20	6	-1	-14
Q07_2_05	Q07_2_05	19	-14	4	39	11	-1	-12	-33
Q09_3	Q09_3	-7	6	-2	35	10	-2	15	17
Q15_03	Q15_03	10	6	4	7	77 *	-4	9	-3
q15_11n		0	7	-8	8	68 *	18	-7	-11
Q15_01	Q15_01	5	-4	5	2	63 *	15	9	4
Q15_02	Q15_02	24	-5	5	9	53 *	21	13	15
Q07_2_08	Q07_2_08	-10	15	-5	1	-22	-15	-3	13
Q15_06	Q15_06	13	18	10	5	3	73 *	-8	9
Q15_07	Q15_07	9	8	-1	21	11	71 *	8	-1
Q15_09	Q15_09	2	18	4	2	23	57 *	-28	14
Q15_05	Q15_05	5	-1	-7	8	35	54 *	12	-3

		Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8
Q15_10	Q15_10	15	5	-4	16	31	49 *	2	15
Q15_08	Q15_08	8	-4	-5	-2	34	43 *	-29	16
Q15_04	Q15_04	18	12	2	0	37	43 *	-9	14
Q18_01	Q18_01	-3	-1	2	-3	-4	27	10	-14
Q09_5	Q09_5	2	-10	-9	-3	-3	15	-4	12
Q06_09	Q06_09	5	15	-13	5	13	-23	-2	8
Q18_02	Q18_02	10	38	13	-4	2	0	54 *	15
Q07_2_07	Q07_2_07	12	-2	7	27	-9	9	-29	7
Q18_03	Q18_03	17	0	2	-2	-18	-2	-31	17
Q07_2_06	Q07_2_06	14	-14	7	32	-2	-6	-36	-9
Q09_4	Q09_4	-5	17	7	8	26	-12	1	52 *
Q09_1	Q09_1	-1	13	-2	6	-7	13	-2	49 *
Q09_2	Q09_2	12	-18	4	-1	-1	3	1	40

Variance Explained by Each Factor

Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8
3.4803408	3.2247727	3.0760760	3.0499780	2.8628718	2.7318879	1.8117883	1.5166224

Final Communality Estimates: Total = 21.754338

Q06_01	Q06_02	Q06_03	Q06_04	Q06_05	Q06_06	Q06_07	q06_08n	Q06_09	q07_1_1n
0.51449901	0.47533985	0.28927262	0.52426014	0.43234313	0.33655303	0.42111095	0.67215662	0.12247215	0.77749138
Q07_2_01	Q07_2_02	Q07_2_03	Q07_2_04	Q07_2_05	Q07_2_06	Q07_2_07	Q07_2_08	Q08	Q10
0.26887363	0.47566443	0.55576299	0.29032801	0.34430809	0.28511838	0.19752294	0.12671245	0.34091432	0.20291009
Q14	Q15_01	Q15_02	Q15_03	Q15_04	Q15_05	Q15_06	Q15_07	Q15_08	Q15_09
0.31130900	0.43518837	0.43599957	0.61950424	0.39092965	0.44415085	0.60954981	0.57732730	0.41926774	0.51191821
Q15_10	q15_11n	Q18_01	Q18_02	Q18_03	Q18_04	q20_1n	Q20_2	Q20_3	Q20_4
0.41463357	0.53446492	0.10653480	0.48610286	0.18354632	0.12525645	0.66583490	0.26599155	0.43528062	0.40804539
Q20_5	Q20_6	Q20_7	Q20_8	Q21	Q11	Q12	Q13	Q16	Q09_1
0.45715451	0.31664071	0.57204874	0.42990611	0.15332176	0.67321050	0.68065991	0.59655663	0.45877227	0.28226016
Q09_2	Q09_3	Q09_4	Q09_5	Q19					
0.20640777	0.19659060	0.39113193	0.05918825	0.24603760					

Scoring Coefficients Estimated by Regression

Squared Multiple Correlations of the Variables with Each Factor

Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8
0.88697419	0.88932591	0.86350770	0.90747341	0.85576656	0.85076002	0.79045162	0.75219530

Standardized Scoring Coefficients

		Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8
q20_1n		0.33323	0.01616	0.02962	-0.12071	-0.04965	-0.05034	-0.05286	0.12150
Q20_7	Q20_7	0.22500	0.04284	-0.02837	-0.01917	-0.01111	0.01656	0.03418	-0.06167
Q20_5	Q20_5	0.14595	-0.02050	0.01359	0.01522	0.04381	-0.03328	0.01730	-0.02953
Q20_8	Q20_8	0.13633	-0.00311	-0.02343	0.00103	-0.00873	0.00286	-0.01339	-0.05268
Q20_3	Q20_3	0.12251	0.03600	-0.00979	0.00280	0.02560	-0.03255	-0.07893	0.04590
Q20_6	Q20_6	0.12386	-0.05804	0.02401	-0.07165	-0.02429	0.02636	0.04100	-0.00580
Q20_4	Q20_4	0.09763	0.11027	-0.05305	0.05075	0.01980	-0.05378	-0.00003	-0.15989
Q20_2	Q20_2	0.10032	0.01465	0.02221	0.00246	-0.04825	0.00284	-0.05788	0.05924
Q12	Q12	0.00385	0.29549	-0.00900	-0.01797	-0.00804	-0.03201	-0.15902	-0.02078
Q11	Q11	-0.05574	0.27917	-0.03189	0.03237	-0.03403	0.01119	0.06034	0.03581
Q13	Q13	-0.01537	0.21956	-0.05423	0.02946	0.05209	-0.06496	0.02726	0.06826
Q16	Q16	-0.04756	0.05707	0.08706	0.00128	0.04466	0.02693	-0.00345	-0.16730
Q10	Q10	0.00734	0.06820	-0.01671	0.00313	-0.06787	0.03472	0.03050	0.00231
Q08	Q08	0.05982	0.06589	-0.03469	-0.05908	-0.04857	0.02385	0.10464	-0.04542
Q19	Q19	0.04831	0.09201	0.03995	-0.00517	-0.02715	0.00369	-0.00453	-0.08913
Q21	Q21	0.02392	0.07199	0.00937	0.02665	0.00715	-0.02667	-0.04465	0.01392

Q06_04	Q06_04	-0.00271	-0.03845	0.24947	-0.05251	0.00714	-0.02335	-0.18175	0.06162
q06_08n		0.00703	-0.03374	0.21724	0.04996	0.03378	-0.04598	0.21177	0.04638
Q06_01	Q06_01	0.01995	-0.12243	0.18436	-0.01343	-0.01014	0.02045	0.12170	0.08804
Q06_07	Q06_07	-0.04647	0.03797	0.18595	0.03996	-0.00553	-0.00821	-0.12030	-0.01797
Q06_06	Q06_06	-0.01767	-0.00057	0.14267	-0.00111	-0.02241	0.01070	-0.07133	-0.01373
Q06_02	Q06_02	0.00062	-0.00104	0.13058	0.05598	-0.03760	0.02244	0.07551	-0.08867
Q06_03	Q06_03	0.01359	-0.00041	0.10610	-0.00466	-0.00941	-0.00802	-0.05543	-0.02129
Q06_05	Q06_05	0.00807	-0.02193	0.11425	0.01202	0.04042	-0.02378	0.14668	-0.00559
Q18_04	Q18_04	-0.00931	-0.01264	0.04963	-0.03057	0.01721	0.02730	-0.01452	0.05768
q07_1_1n		-0.07379	0.05382	-0.07635	0.68220	-0.12457	-0.14166	-0.05610	0.10873
Q07_2_02	Q07_2_02	-0.04359	0.01091	-0.02527	0.19237	-0.01593	0.01132	-0.00604	0.12393
Q07_2_03	Q07_2_03	-0.00405	-0.07437	-0.01331	0.09028	0.00707	0.10274	0.08145	-0.12417
Q07_2_04	Q07_2_04	0.00195	0.03113	0.02274	0.05706	0.01562	0.00957	-0.06613	-0.06795
Q07_2_01	Q07_2_01	-0.00413	0.00205	-0.00869	0.04269	-0.02658	-0.00430	0.09874	0.06874
Q14	Q14	0.00652	0.06776	0.02707	0.04364	0.04090	-0.00589	-0.01584	-0.08851
Q07_2_05	Q07_2_05	0.02024	-0.00872	0.02582	0.02190	0.04350	-0.01854	-0.03506	-0.14555
Q09_3	Q09_3	-0.04068	-0.00356	-0.03430	0.07757	0.02428	-0.01455	0.06793	0.07225
Q15_03	Q15_03	-0.00373	-0.03916	0.00680	-0.10878	0.39083	-0.10474	0.02373	-0.06473
q15_11n		-0.04269	0.02236	-0.04596	0.06480	0.24844	-0.05186	-0.07637	-0.07150
Q15_01	Q15_01	-0.00986	-0.02623	0.01478	-0.02088	0.15096	-0.00690	0.02566	0.02814
Q15_02	Q15_02	0.03436	-0.02527	-0.00497	-0.01458	0.11507	0.00629	0.05090	0.07890
Q07_2_08	Q07_2_08	0.01012	0.02501	-0.00732	-0.07442	-0.01984	-0.02262	-0.00455	0.04949
Q15_06	Q15_06	0.04099	0.00069	0.03533	-0.12078	-0.09266	0.35238	-0.03325	-0.01586
Q15_07	Q15_07	-0.05478	0.01394	-0.03700	0.07439	-0.07379	0.28036	0.09635	-0.04329
Q15_09	Q15_09	-0.02094	0.04628	0.01248	-0.00625	0.02580	0.14510	-0.14632	0.05479
Q15_05	Q15_05	-0.02772	-0.04550	-0.02891	-0.02576	0.07344	0.16486	0.07575	-0.03843
Q15_10	Q15_10	0.02067	0.00911	-0.02622	0.04379	0.01176	0.12900	0.03077	0.07774
Q15_08	Q15_08	-0.02736	-0.02419	0.01902	-0.01941	0.08497	0.07274	-0.11319	0.06069
Q15_04	Q15_04	0.02027	0.02706	-0.00236	0.01836	0.08535	0.07367	-0.06502	0.04997
Q18_01	Q18_01	0.00121	-0.00813	-0.01396	0.01528	-0.04602	0.06806	0.03871	-0.03850
Q09_5	Q09_5	-0.00834	-0.01610	-0.00947	-0.00934	-0.00649	0.03124	0.01128	0.04843
Q06_09	Q06_09	0.01082	0.05794	-0.04981	0.02313	0.04862	-0.08468	-0.02445	0.04453
Q18_02	Q18_02	0.01922	0.07380	-0.05509	0.07116	-0.05265	0.00055	0.24011	0.10005
Q07_2_07	Q07_2_07	0.01744	0.00052	0.02339	0.05604	-0.03272	0.00595	-0.08880	0.03155
Q18_03	Q18_03	0.02990	-0.00502	0.02772	-0.00456	-0.04439	-0.01135	-0.10859	0.06947
Q07_2_06	Q07_2_06	0.02651	-0.00474	0.05579	-0.01091	0.01202	-0.00425	-0.15845	-0.06561
Q09_4	Q09_4	-0.02647	0.00216	0.00005	0.01339	0.10479	-0.07730	-0.00591	0.28548
Q09_1	Q09_1	-0.00607	0.02601	-0.01151	0.02659	-0.02691	0.01429	-0.00250	0.20039
Q09_2	Q09_2	0.00652	-0.03133	0.00677	-0.00129	0.00791	0.00503	0.01419	0.15619

Rotation Method: Promax (power = 3)

Target Matrix for Procrustean Transformation

		Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8
q20_1n		100 *	0	0	0	0	0	0	1
Q20_7	Q20_7	92 *	0	0	1	0	1	0	0
Q20_5	Q20_5	85 *	0	0	1	3	0	0	0
Q20_8	Q20_8	91 *	-1	0	0	0	0	0	0
Q20_3	Q20_3	64 *	0	0	4	3	0	-2	1
Q20_6	Q20_6	89 *	-4	0	0	0	0	0	0
Q20_4	Q20_4	53 *	3	0	0	2	0	0	-10
Q20_2	Q20_2	61 *	0	0	-3	-1	1	-2	5

Q12	Q12	0	100 *	0	-1	0	0	0	0
Q11	Q11	-1	86 *	1	0	0	0	2	0
Q13	Q13	0	95 *	0	0	1	0	1	1
Q16	Q16	-4	29	14	0	1	0	1	-8
Q10	Q10	0	74 *	0	0	-8	1	1	0
Q08	Q08	7	32	0	-2	-3	0	26	0
Q19	Q19	0	50 *	12	0	-1	0	2	-4
Q21	Q21	2	80 *	0	1	0	0	-3	0
Q06_04	Q06_04	0	0	78 *	0	0	0	-11	0
q06_08n		0	1	48 *	1	1	0	32	0
Q06_01	Q06_01	0	-1	59 *	0	0	0	24	1
Q06_07	Q06_07	-1	4	77 *	0	0	0	-1	0
Q06_06	Q06_06	0	0	93 *	0	-1	0	0	0
Q06_02	Q06_02	0	1	52 *	4	0	0	15	-1
Q06_03	Q06_03	0	0	100 *	0	0	0	0	0
Q06_05	Q06_05	1	0	39	0	1	0	49 *	0
Q18_04	Q18_04	0	0	27	-2	3	7	0	16
q07_1_1n		1	0	0	100 *	0	0	-1	0
Q07_2_02	Q07_2_02	0	0	0	98 *	0	1	0	1
Q07_2_03	Q07_2_03	0	-2	0	76 *	0	2	0	-1
Q07_2_04	Q07_2_04	0	1	0	79 *	0	0	-4	-1
Q07_2_01	Q07_2_01	0	0	0	72 *	-1	0	9	3
Q14	Q14	1	6	3	43 *	5	0	0	-2
Q07_2_05	Q07_2_05	3	-1	0	33	1	0	-2	-23
Q09_3	Q09_3	0	0	0	57 *	1	0	9	7
Q15_03	Q15_03	0	0	0	0	100 *	0	0	0
q15_11n		0	0	0	0	88 *	2	0	0
Q15_01	Q15_01	0	0	0	0	94 *	1	1	0
Q15_02	Q15_02	5	0	0	0	57 *	4	2	1
Q07_2_08	Q07_2_08	-2	8	0	0	-27	-10	0	7
Q15_06	Q15_06	1	1	0	0	0	100 *	0	0
Q15_07	Q15_07	0	0	0	3	0	99 *	0	0
Q15_09	Q15_09	0	2	0	0	4	62 *	-13	1
Q15_05	Q15_05	0	0	0	0	16	66 *	1	0
Q15_10	Q15_10	1	0	0	2	12	56 *	0	1
Q15_08	Q15_08	0	0	0	0	16	35	-20	2
Q15_04	Q15_04	2	1	0	0	22	39	-1	1
Q18_01	Q18_01	0	0	0	0	0	70 *	7	-9
Q09_5	Q09_5	0	-9	-5	0	0	30	-1	14
Q06_09	Q06_09	0	8	-6	0	6	-35	0	2
Q18_02	Q18_02	0	18	1	0	0	0	100 *	1
Q07_2_07	Q07_2_07	2	0	0	26	-1	1	-60 *	0
Q18_03	Q18_03	6	0	0	0	-8	0	-80 *	8
Q07_2_06	Q07_2_06	2	-2	0	24	0	0	-65 *	-1
Q09_4	Q09_4	0	2	0	0	7	-1	0	72 *
Q09_1	Q09_1	0	2	0	0	0	2	0	100 *
Q09_2	Q09_2	2	-7	0	0	0	0	0	85 *

Procrustean Transformation Matrix

	1	2	3	4	5	6	7	8
1	1.22857123	0.02591277	0.00089227	-0.1482583	-0.0580863	-0.0645297	-0.0055549	-

	1	2	3	4	5	6	7	8
								0.0272588
2	0.09257755	1.09486164	-0.140507	0.05260121	-0.0741689	-0.0327215	0.0076946	-0.0352354
3	-0.0069988	-0.1122552	1.14838824	-0.0879083	-0.01184	-0.0147167	-0.0114816	-0.002581
4	-0.1741562	0.03512492	-0.0629782	1.21146447	-0.0865988	-0.0304697	-0.0218175	0.06796605
5	-0.0714447	-0.0624093	-0.0120582	-0.1231812	1.03716581	-0.1661799	0.0086395	0.00034435
6	-0.1150531	-0.0609206	-0.0122243	-0.0519879	-0.1473688	1.24290547	0.01293375	-0.0667879
7	-0.0892853	-0.0801199	-0.1563627	0.03178582	-0.0151423	0.05437647	1.05548738	0.02510594
8	-0.0351069	-0.0586362	-0.0015785	0.11044432	-0.0183392	-0.0531759	0.03321948	0.99126418

Normalized Oblique Transformation Matrix

	1	2	3	4	5	6	7	8
1	0.42461	0.09066	0.14305	0.32343	0.37823	0.36497	0.02571	0.03368
2	-0.25341	0.60611	0.44658	-0.19725	0.01724	0.03641	0.31395	0.04244
3	0.30442	-0.10545	0.50646	0.43331	-0.40630	-0.48648	0.08625	-0.10696
4	0.85769	0.20505	-0.20325	-0.62438	-0.13216	-0.17456	0.23140	0.06741
5	0.06317	0.78769	-0.56639	0.54108	-0.41184	-0.05888	-0.23479	0.00730
6	0.11768	-0.08595	0.41322	-0.11884	-0.60986	0.51403	-0.49406	0.33821
7	-0.09896	-0.08245	-0.03849	0.25468	0.27102	-0.48317	0.04595	0.93511
8	0.21111	0.20635	0.29127	-0.29815	0.48305	-0.50268	-0.76111	-0.21275

Inter-Factor Correlations

	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8
Factor1	100 *	-8	3	28	18	19	6	3
Factor2	-8	100 *	22	-6	13	10	9	10
Factor3	3	22	100 *	13	7	6	16	0
Factor4	28	-6	13	100 *	22	13	3	-14
Factor5	18	13	7	22	100 *	31	2	3
Factor6	19	10	6	13	31	100 *	-3	12
Factor7	6	9	16	3	2	-3	100 *	-5
Factor8	3	10	0	-14	3	12	-5	100 *

Rotated Factor Pattern (Standardized Regression Coefficients)

		Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8
q20_1n		82 *	7	6	1	-6	-8	-5	14
Q20_7	Q20_7	70 *	7	-3	7	0	10	8	-6
Q20_8	Q20_8	62 *	-11	-9	2	4	-2	-5	-8
Q20_5	Q20_5	60 *	-5	1	1	15	4	6	-8
Q20_3	Q20_3	54 *	9	-5	16	14	-3	-15	10
Q20_4	Q20_4	53 *	24	-10	0	14	-11	2	-29
Q20_6	Q20_6	52 *	-19	3	-7	-4	6	2	-2
Q20_2	Q20_2	47 *	1	10	-20	-13	7	-10	15
Q12	Q12	-2	81 *	2	-11	0	-1	-8	1
Q11	Q11	-11	73 *	4	-9	0	8	20	4
Q13	Q13	-4	72 *	-2	3	10	-6	14	11
Q10	Q10	1	41 *	-7	4	-24	10	8	3
Q16	Q16	-23	40 *	28	5	10	6	8	-28
Q08	Q08	29	39	-11	-15	-21	2	29	-8
Q19	Q19	6	37	18	5	-13	3	10	-17
Q21	Q21	11	36	2	8	1	1	-9	-2
Q06_04	Q06_04	-2	-2	71 *	3	1	-6	-28	10
Q06_07	Q06_07	-11	16	59 *	4	-5	3	-13	-1
Q06_06	Q06_06	0	2	58 *	-9	-12	0	-8	0
Q06_01	Q06_01	3	-24	58 *	-9	5	5	35	13
q06_08n		7	5	56 *	11	10	-5	43 *	8
Q06_03	Q06_03	3	-1	55 *	-8	-1	-3	-4	-5
Q06_02	Q06_02	-3	10	49 *	19	-6	3	28	-14
Q06_05	Q06_05	11	-2	42 *	-2	12	0	40 *	1
Q18_04	Q18_04	-5	0	23	-10	10	12	0	

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		Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8
q07_1_1n		6	-6	-4	88 *	-11	-7	-15	7
Q07_2_02	Q07_2_02	-6	-2	-7	69 *	-1	8	-9	17
Q07_2_03	Q07_2_03	-1	-18	-4	64 *	3	19	3	-12
Q07_2_01	Q07_2_01	-4	4	-5	50 *	-14	-5	18	19
Q07_2_04	Q07_2_04	0	11	7	47 *	3	1	-16	-10
Q09_3	Q09_3	-14	5	-7	40	7	-4	16	20
Q14	Q14	6	21	12	37	15	2	-3	-13
Q07_2_05	Q07_2_05	14	-11	5	34	9	-3	-14	-32
Q15_03	Q15_03	5	1	1	-2	80 *	-15	9	-2
q15_11n		-5	4	-10	0	69 *	9	-7	-12
Q15_01	Q15_01	-2	-10	3	-6	64 *	7	10	3
Q15_02	Q15_02	17	-11	2	1	51 *	13	14	14
Q07_2_08	Q07_2_08	-7	17	-6	8	-22	-14	-3	15
Q15_06	Q15_06	7	14	8	1	-10	75 *	-7	3
Q15_07	Q15_07	-2	4	-5	18	-2	73 *	8	-5
Q15_09	Q15_09	-2	15	5	-2	15	55 *	-27	9
Q15_05	Q15_05	-4	-6	-10	2	28	53 *	13	-6
Q15_10	Q15_10	6	1	-7	11	23	46 *	3	12
Q15_08	Q15_08	4	-7	-1	-8	30	38	-28	12
Q15_04	Q15_04	13	8	1	-7	31	38	-8	10
Q18_01	Q18_01	-6	-3	1	-5	-8	31	10	-16
Q09_5	Q09_5	1	-11	-7	-3	-4	16	-3	11
Q06_09	Q06_09	7	17	-16	7	16	-27	-2	10
Q18_02	Q18_02	10	33	1	-2	-3	0	55 *	15
Q07_2_07	Q07_2_07	10	0	10	27	-13	8	-30	7
Q18_03	Q18_03	21	2	7	-2	-20	-2	-31	16
Q07_2_06	Q07_2_06	12	-11	13	30	-4	-8	-38	-8
Q09_4	Q09_4	-8	13	4	12	26	-19	2	54 *
Q09_1	Q09_1	-3	11	-4	12	-12	12	0	49 *
Q09_2	Q09_2	9	-21	6	0	-2	2	2	41 *

Reference Axis Correlations

	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8
Factor1	100 *	11	0	-24	-9	-13	-8	-6
Factor2	11	100 *	-21	8	-12	-7	-7	-8
Factor3	0	-21	100 *	-13	0	-2	-14	-1
Factor4	-24	8	-13	100 *	-17	-5	1	16
Factor5	-9	-12	0	-17	100 *	-26	-1	-1
Factor6	-13	-7	-2	-5	-26	100 *	5	-11
Factor7	-8	-7	-14	1	-1	5	100 *	5
Factor8	-6	-8	-1	16	-1	-11	5	100 *

Reference Structure (Semipartial Correlations)

		Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8
q20_1n		77 *	6	6	1	-5	-8	-5	13
Q20_7	Q20_7	66 *	6	-3	7	0	9	8	-6
Q20_8	Q20_8	58 *	-10	-8	1	4	-1	-5	-8
Q20_5	Q20_5	56 *	-5	1	1	14	4	5	-8
Q20_3	Q20_3	51 *	8	-5	14	13	-3	-15	10
Q20_4	Q20_4	49 *	22	-9	0	13	-11	2	-28
Q20_6	Q20_6	49 *	-18	3	-7	-4	6	2	-2
Q20_2	Q20_2	44 *	0	10	-18	-12	7	-10	14
Q12	Q12	-2	77 *	2	-10	0	-1	-8	1
Q11	Q11	-11	69 *	4	-9	0	8	19	4
Q13	Q13	-4	69 *	-2	3	9	-5	13	11
Q10	Q10	1	39	-7	4	-22	10	8	

3

		Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8
Q16	Q16	-21	38	27	4	9	6	8	-27
Q08	Q08	27	37	-10	-14	-20	2	29	-8
Q19	Q19	5	36	17	5	-12	3	9	-16
Q21	Q21	11	35	2	7	1	1	-9	-2
Q06_04	Q06_04	-2	-2	67 *	3	1	-6	-27	10
Q06_07	Q06_07	-10	15	56 *	4	-5	3	-13	-1
Q06_06	Q06_06	0	2	55 *	-8	-11	0	-8	0
Q06_01	Q06_01	2	-23	55 *	-8	5	5	34	13
q06_08n		7	5	53 *	10	9	-5	43 *	8
Q06_03	Q06_03	3	-1	52 *	-8	-1	-3	-4	-5
Q06_02	Q06_02	-3	10	47 *	17	-5	3	27	-14
Q06_05	Q06_05	11	-2	40 *	-2	11	0	39	1
Q18_04	Q18_04	-5	0	22	-9	9	12	0	16
q07_1_1n		5	-6	-4	81 *	-10	-6	-15	7
Q07_2_02	Q07_2_02	-6	-2	-6	64 *	-1	8	-9	16
Q07_2_03	Q07_2_03	-1	-17	-3	59 *	3	17	3	-12
Q07_2_01	Q07_2_01	-3	3	-5	46 *	-13	-4	18	19
Q07_2_04	Q07_2_04	0	11	6	44 *	2	1	-16	-10
Q09_3	Q09_3	-13	5	-7	37	7	-4	15	20
Q14	Q14	5	20	12	34	14	2	-3	-13
Q07_2_05	Q07_2_05	13	-10	5	31	8	-3	-14	-31
Q15_03	Q15_03	5	1	1	-1	74 *	-14	9	-2
q15_11n		-5	4	-9	0	64 *	9	-7	-12
Q15_01	Q15_01	-2	-10	3	-6	59 *	7	10	3
Q15_02	Q15_02	16	-11	2	1	47 *	12	14	14
Q07_2_08	Q07_2_08	-6	16	-6	8	-21	-13	-2	14
Q15_06	Q15_06	7	13	8	1	-10	69 *	-7	3
Q15_07	Q15_07	-2	3	-5	16	-2	67 *	8	-5
Q15_09	Q15_09	-2	15	5	-2	14	51 *	-26	8
Q15_05	Q15_05	-4	-5	-9	2	26	49 *	12	-6
Q15_10	Q15_10	6	1	-7	10	21	43 *	3	12
Q15_08	Q15_08	4	-7	-1	-8	28	36	-28	12
Q15_04	Q15_04	12	8	1	-6	28	35	-7	10
Q18_01	Q18_01	-5	-3	1	-5	-7	28	10	-15
Q09_5	Q09_5	1	-10	-7	-3	-4	15	-3	11
Q06_09	Q06_09	7	16	-15	7	14	-26	-2	9
Q18_02	Q18_02	9	32	1	-2	-2	0	54 *	15
Q07_2_07	Q07_2_07	10	0	9	25	-12	7	-29	7
Q18_03	Q18_03	19	2	7	-1	-18	-2	-30	15
Q07_2_06	Q07_2_06	11	-10	12	27	-3	-8	-37	-7
Q09_4	Q09_4	-7	13	4	11	24	-17	2	52 *
Q09_1	Q09_1	-3	10	-3	11	-11	11	0	48 *
Q09_2	Q09_2	9	-20	6	0	-2	2	2	40

Variance Explained by Each Factor Eliminating Other Factors

Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8
2.9687214	2.8326635	2.6588022	2.5707702	2.3273209	2.2838941	1.8157182	1.4476182

Factor Structure (Correlations)

	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8
q20_1n	79 *	0	8	20	8	8	2	16

Q20_7	Q20_7	74 *	1	3	29	18	23	13	-4
Q20_8	Q20_8	63 *	-19	-10	20	13	9	-3	-7
Q20_5	Q20_5	65 *	-8	4	24	27	19	10	-6
Q20_3	Q20_3	59 *	4	-1	31	27	16	-11	11
Q20_4	Q20_4	50 *	15	-2	19	21	1	8	-26
Q20_6	Q20_6	53 *	-22	0	9	3	12	4	0
Q20_2	Q20_2	40 *	0	7	-9	-5	12	-7	20
Q12	Q12	-13	81 *	17	-17	7	6	-1	11
Q11	Q11	-17	78 *	22	-15	9	13	25	12
Q13	Q13	-7	75 *	16	-2	18	5	19	17
Q10	Q10	-3	38	3	-3	-15	7	10	7
Q16	Q16	-21	48 *	39	7	15	8	16	-24
Q08	Q08	20	35	0	-13	-14	1	32	-3
Q19	Q19	3	38	28	7	-4	3	17	-14
Q21	Q21	10	35	10	10	9	9	-5	1
Q06_04	Q06_04	-2	12	66 *	9	4	0	-17	10
Q06_07	Q06_07	-10	28	60 *	7	1	5	-3	0
Q06_06	Q06_06	-4	13	55 *	-4	-10	-1	1	2
Q06_01	Q06_01	8	-5	58 *	1	7	7	41 *	11
q06_08n		16	22	66 *	22	18	4	54 *	5
Q06_03	Q06_03	1	10	53 *	0	0	-1	5	-4
Q06_02	Q06_02	4	20	58 *	26	4	5	37	-17
Q06_05	Q06_05	17	11	49 *	10	17	6	48 *	0
Q18_04	Q18_04	-3	10	23	-7	12	16	2	20
q07_1_1n		27	-16	3	85 *	6	2	-13	-6
Q07_2_02	Q07_2_02	15	-6	0	65 *	15	17	-9	8
Q07_2_03	Q07_2_03	23	-21	2	69 *	20	24	3	-21
Q07_2_01	Q07_2_01	8	1	4	42 *	-4	-2	18	11
Q07_2_04	Q07_2_04	12	8	13	49 *	15	9	-12	-14
Q09_3	Q09_3	-2	6	1	33	13	3	14	14
Q14	Q14	17	21	22	45 *	28	14	4	-15
Q07_2_05	Q07_2_05	24	-16	6	44 *	16	2	-10	-36
Q15_03	Q15_03	16	10	7	16	77 *	10	12	-2
q15_11n		7	10	-5	15	71 *	29	-7	-8
Q15_01	Q15_01	11	1	7	9	64 *	25	10	5
Q15_02	Q15_02	31	-2	7	18	58 *	32	15	16
Q07_2_08	Q07_2_08	-12	13	-4	-4	-24	-18	-3	13
Q15_06	Q15_06	18	21	14	10	17	75 *	-6	13
Q15_07	Q15_07	17	9	3	26	24	73 *	6	1
Q15_09	Q15_09	8	23	8	6	33	62 *	-27	19
Q15_05	Q15_05	12	2	-4	14	43 *	59 *	10	-1
Q15_10	Q15_10	22	7	-1	22	41 *	57 *	1	17
Q15_08	Q15_08	13	-1	-4	2	40	49 *	-30	19
Q15_04	Q15_04	23	15	5	7	45 *	51 *	-7	18
Q18_01	Q18_01	-2	0	2	-2	-1	24	9	-13
Q09_5	Q09_5	3	-10	-10	-4	-1	14	-6	12
Q06_09	Q06_09	5	13	-11	5	11	-18	-2	8
Q18_02	Q18_02	10	39	17	-3	4	4	58 *	16
Q07_2_07	Q07_2_07	16	-3	8	27	-3	11	-28	6
Q18_03	Q18_03	15	-1	1	-3	-17	-1	-29	

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Q07_2_06	Q07_2_06	17	-16	8	33	1	-3	-34	-12
Q09_4	Q09_4	-2	21	10	6	25	-3	3	52 *
Q09_1	Q09_1	1	14	0	2	-4	15	-2	49 *
Q09_2	Q09_2	13	-16	2	-1	-1	6	0	39

Variance Explained by Each Factor Ignoring Other Factors

Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8
3.9581984	3.5544840	3.3491325	3.5868647	3.5681851	3.4630440	2.1562253	1.6206335

Final Communality Estimates: Total = 21.754338

Q06_01	Q06_02	Q06_03	Q06_04	Q06_05	Q06_06	Q06_07	q06_08n	Q06_09	q07_1_1n
0.51449901	0.47533985	0.28927262	0.52426014	0.43234313	0.33655303	0.42111095	0.67215662	0.12247215	0.77749138
Q07_2_01	**Q07_2_02**	**Q07_2_03**	**Q07_2_04**	**Q07_2_05**	**Q07_2_06**	**Q07_2_07**	**Q07_2_08**	**Q08**	**Q10**
0.26887363	0.47566443	0.55576299	0.29032801	0.34430809	0.28511838	0.19752294	0.12671245	0.34091432	0.20291009
Q14	**Q15_01**	**Q15_02**	**Q15_03**	**Q15_04**	**Q15_05**	**Q15_06**	**Q15_07**	**Q15_08**	**Q15_09**
0.31130900	0.43518837	0.43599957	0.61950424	0.39092965	0.44415085	0.60954981	0.57732730	0.41926774	0.51191821
Q15_10	**q15_11n**	**Q18_01**	**Q18_02**	**Q18_03**	**Q18_04**	**q20_1n**	**Q20_2**	**Q20_3**	**Q20_4**
0.41463357	0.53446492	0.10653480	0.48610286	0.18354632	0.12525645	0.66583490	0.26599155	0.43528062	0.40804539
Q20_5	**Q20_6**	**Q20_7**	**Q20_8**	**Q21**	**Q11**	**Q12**	**Q13**	**Q16**	**Q09_1**
0.45715451	0.31664071	0.57204874	0.42990611	0.15332176	0.67321050	0.68065991	0.59655663	0.45877227	0.28226016
Q09_2	**Q09_3**	**Q09_4**	**Q09_5**	**Q19**					
0.20640777	0.19659060	0.39113193	0.05918825	0.24603760					

Scoring Coefficients Estimated by Regression

Squared Multiple Correlations of the Variables with Each Factor

Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8
0.89886425	0.90032268	0.87241389	0.91773237	0.87650155	0.87540881	0.81154790	0.75981729

Standardized Scoring Coefficients

		Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8
q20_1n		0.30819	0.00020	0.02381	-0.08235	-0.03946	-0.01879	-0.02649	0.13529
Q20_7	Q20_7	0.21756	0.02066	-0.02205	0.01662	0.00886	0.03450	0.04778	-0.05436
Q20_8	Q20_8	0.13278	-0.01802	-0.02224	0.02248	0.00211	0.01186	-0.00748	-0.05009
Q20_5	Q20_5	0.14693	-0.02893	0.01499	0.04301	0.05060	-0.01247	0.02878	-0.03081
Q20_3	Q20_3	0.12082	0.02868	-0.00494	0.01623	0.03354	-0.00842	-0.06780	0.05093
Q20_4	Q20_4	0.09513	0.08695	-0.03733	0.06837	0.02998	-0.04067	0.01285	-0.15742
Q20_6	Q20_6	0.11399	-0.06190	0.01450	-0.04883	-0.02140	0.02635	0.04597	-0.00172
Q20_2	Q20_2	0.09667	0.00937	0.02317	0.00898	-0.03614	0.01218	-0.04861	0.06200
Q12	Q12	-0.00782	0.28965	0.01749	-0.02877	0.00453	-0.01389	-0.13116	0.00153
Q11	Q11	-0.05649	0.27300	-0.00128	0.01146	-0.01674	0.02037	0.07250	0.04555
Q13	Q13	-0.01416	0.21382	-0.02862	0.01710	0.05606	-0.03806	0.03791	0.07463
Q10	Q10	0.00377	0.06085	-0.01013	-0.00277	-0.05706	0.02798	0.03115	0.00516
Q16	Q16	-0.04575	0.06756	0.09299	0.01311	0.04832	0.02262	0.01444	-0.16133
Q08	Q08	0.04749	0.05350	-0.03101	-0.05078	-0.04394	0.01723	0.10685	-0.03884
Q19	Q19	0.04188	0.08702	0.04830	0.00522	-0.01667	0.00494	0.01326	-0.08234
Q21	Q21	0.02471	0.06991	0.01812	0.02625	0.01322	-0.01437	-0.03454	0.01640
Q06_04	Q06_04	-0.00793	-0.00242	0.23742	-0.04534	0.00293	-0.01578	-0.14622	0.06863
Q06_07	Q06_07	-0.04212	0.06103	0.18884	0.03907	0.00181	-0.00440	-0.09113	-0.01628
Q06_06	Q06_06	-0.01833	0.01657	0.13982	0.00171	-0.01810	0.00809	-0.05132	-0.01143
Q06_01	Q06_01	0.02448	-0.09752	0.17117	0.00005	-0.01022	0.02003	0.13441	0.07842
q06_08n		0.01727	-0.00928	0.21808	0.06595	0.03485	-0.03295	0.23775	0.03120
Q06_03	Q06_03	0.01149	0.01014	0.10387	0.00219	-0.00691	-0.00656	-0.03788	-0.01927
Q06_02	Q06_02	0.00594	0.00632	0.13337	0.06667	-0.02513	0.01544	0.09281	-0.09526
Q06_05	Q06_05	0.01289	-0.00865	0.11425	0.02627	0.03858	-0.01661	0.16087	-0.01300
Q18_04	Q18_04	-0.00839	-0.00027	0.04662	-0.02944	0.01730	0.03069	-0.01037	

									0.06116
q07_1_1n		-0.00185	0.01475	-0.02855	0.62609	-0.06733	-0.11210	-0.07218	0.04378
Q07_2_02	Q07_2_02	-0.01610	0.00773	-0.01053	0.17140	0.00525	0.02473	-0.01645	0.10683
Q07_2_03	Q07_2_03	0.01391	-0.07953	-0.01152	0.10313	0.02517	0.09222	0.07017	-0.13311
Q07_2_01	Q07_2_01	0.00122	-0.00060	-0.00494	0.03597	-0.02245	-0.00286	0.09351	0.06048
Q07_2_04	Q07_2_04	0.00886	0.03052	0.02961	0.06126	0.02580	0.01443	-0.05811	-0.06752
Q09_3	Q09_3	-0.02734	-0.00423	-0.02794	0.06682	0.02613	-0.00683	0.05777	0.06176
Q14	Q14	0.01175	0.06731	0.03766	0.05233	0.04902	0.00326	-0.00312	-0.08653
Q07_2_05	Q07_2_05	0.02180	-0.01066	0.02662	0.03762	0.04359	-0.01703	-0.02582	-0.14531
Q15_03	Q15_03	0.00400	-0.01232	0.00390	-0.06876	0.35204	-0.05567	0.03436	-0.05452
q15_11n		-0.02119	0.03080	-0.03413	0.07796	0.23997	-0.01562	-0.07488	-0.07041
Q15_01	Q15_01	-0.00031	-0.01142	0.01484	-0.00773	0.14223	0.01457	0.02729	0.03013
Q15_02	Q15_02	0.04341	-0.01655	-0.00396	-0.00143	0.11299	0.02961	0.04979	0.07968
Q07_2_08	Q07_2_08	-0.00208	0.02564	-0.01088	-0.07829	-0.02860	-0.02402	-0.00282	0.05577
Q15_06	Q15_06	0.04025	0.01172	0.03099	-0.10431	-0.05061	0.32613	-0.03754	0.01100
Q15_07	Q15_07	-0.03257	0.01231	-0.02603	0.07158	-0.02983	0.25681	0.07636	-0.04108
Q15_09	Q15_09	-0.01057	0.05905	0.01862	-0.00796	0.04764	0.15180	-0.14512	0.06960
Q15_05	Q15_05	-0.01433	-0.03673	-0.02937	-0.01221	0.08551	0.16055	0.06162	-0.03219
Q15_10	Q15_10	0.03685	0.01070	-0.01813	0.04661	0.03642	0.13742	0.02225	0.07950
Q15_08	Q15_08	-0.01727	-0.00708	0.01743	-0.01681	0.08904	0.08453	-0.11426	0.06922
Q15_04	Q15_04	0.03372	0.03529	0.00537	0.02677	0.09989	0.09435	-0.06287	0.05738
Q18_01	Q18_01	0.00360	-0.01307	-0.01316	0.01625	-0.03495	0.05641	0.03291	-0.03908
Q09_5	Q09_5	-0.00657	-0.01367	-0.01112	-0.01261	-0.00471	0.02984	0.00571	0.04878
Q06_09	Q06_09	0.01132	0.05203	-0.04211	0.01801	0.04191	-0.06649	-0.02297	0.04358
Q18_02	Q18_02	0.02629	0.06013	-0.04022	0.06212	-0.03977	0.00581	0.23168	0.08840
Q07_2_07	Q07_2_07	0.02274	-0.00012	0.02580	0.05200	-0.02191	0.00999	-0.08485	0.02938
Q18_03	Q18_03	0.02598	-0.00345	0.02451	-0.00969	-0.04151	-0.00870	-0.10328	0.07173
Q07_2_06	Q07_2_06	0.02342	0.00010	0.05270	-0.00208	0.01391	-0.00149	-0.14464	-0.05862
Q09_4	Q09_4	-0.01540	0.01927	0.00303	-0.00190	0.09287	-0.04173	-0.00885	0.28077
Q09_1	Q09_1	0.00022	0.03004	-0.00686	0.00955	-0.01928	0.02564	-0.00789	0.19820
Q09_2	Q09_2	0.01125	-0.02389	0.00439	-0.00752	0.00793	0.01515	0.00933	0.15338

APPENDIX F

The following tables and graphs indicate statistically significant associations between the dependent variable and the response variables.

Table 6.5: Contingency table - presence of structured/non-structured risk management approach compared to the annual turnover of SME.

Frequency/ Cell percentage/ Row percentage/ Column percentage/	More than R500 000	Less and equal to R500 000	TOTAL
Yes/presence	24 15.2% 60.0% 36.9%	16 10.1% 40.0% 17.2%	40 25.3%
No/non-presence	41 26.0% 34.8% 63.1%	77 48.7% 65.2% 82.8%	118 74.7%
TOTAL	65 41.1%	93 58.9%	158 100.0%

Table 6.6: Chi-square test for comparisons.

Question/statement	Sample size	Chi-square	DF	P-value
Comparisons between new1 and Q01 (annual turnover of SMEs)				
1. Annual turnover of your business	158	7.8681	1	0.0050**

******* *Significant at the 99,9% level of significance (<0.001).*

*** Significant at the 99,0% level of significance (<0.01).*

** Significant at the 95,0% level of significance (<0.05).*

The abovementioned Chi-square test shows that the modes of classification were not independent, indicating an association/relationship between the two variables. The analogy can be drawn that statistically significant more SMEs that did not have a structured risk management approach, had a less and equal to R500 000 turnover.

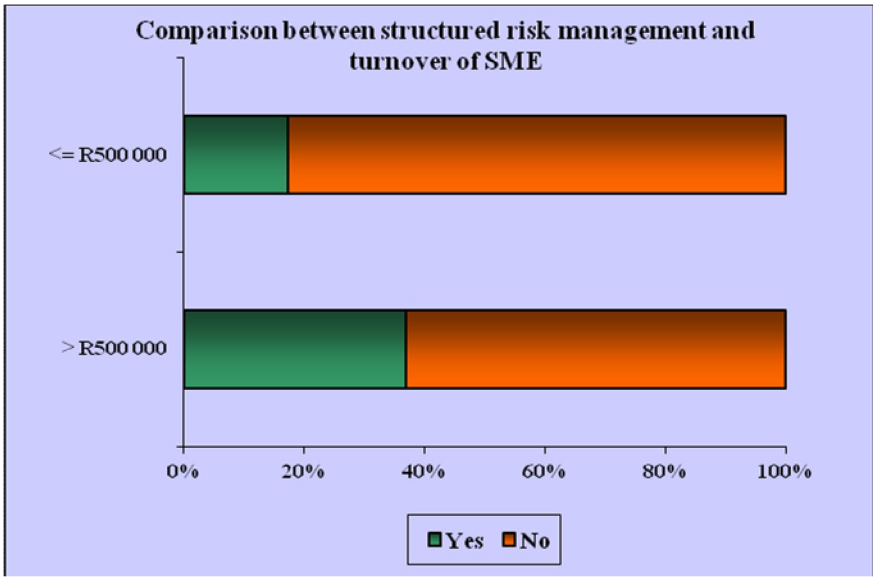

Figure 6.23: Comparison between structured risk management and turnover of SME.

Table 6.7: Contingency table - presence of structured/non-structured risk management approach compared to the number of permanent employees of SME.

Frequency/ Cell percentage/ Row percentage/ Column percentage/	More then 10	Less and equal to 10	TOTAL
Yes/presence	22 13.9% 55.0% 39.3%	18 11.4% 45.0% 17.6%	40 25.3%
No/non-presence	34 21.5% 28.8% 60.7%	84 53.2% 71.2% 82.4%	118 74.7%
TOTAL	56 35.4%	102 64.6%	158 100.0%

Table 6.8: Chi-square test for comparisons.

Question/statement	Sample size	Chi-square	DF	P-value
Comparisons between new1 and Q02 (number of permanent employees of SME's)				
2. Number of permanent employees in your business	158	8.9529	1	0.0.0028***

Statistically significant more SMEs that did not have a structured risk management approach, had less and equal to 10 permanent employees.

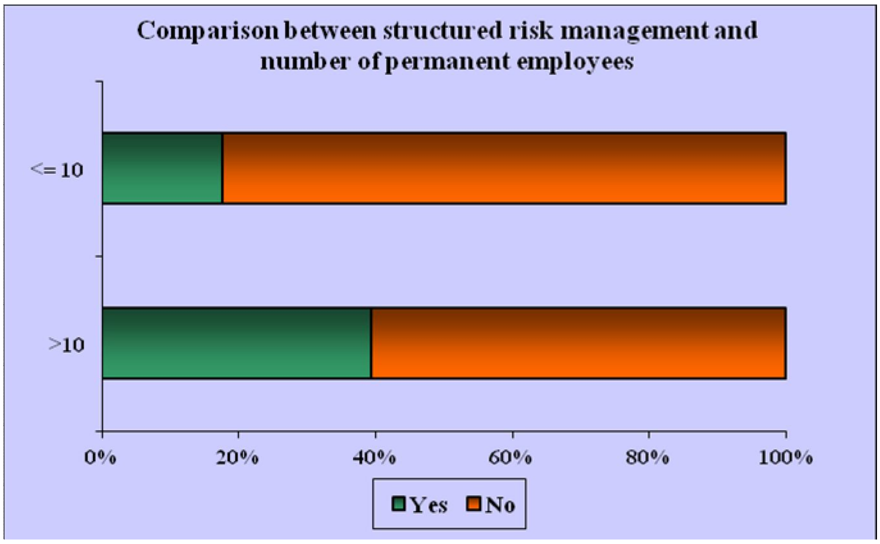

Figure 6.24: Comparison between structured risk management and number of permanent employees.

Table 6.9: Contingency table - presence of structured/non-structured risk management approach compared to entity type.

Frequency/ Cell percentage/ Row percentage/ Column percentage/	Sole proprietorship	Partnership	Closed corporation	Limited Company	Total
Yes/presence	10 6.4% 25.6% 16.4%	8 5.1% 20.5% 26.7%	12 7.7% 30.8% 24.0%	9 5.8% 23.1% 60.0%	39 25.0%
No/non-presence	51 32.7% 43.6% 83.6%	22 14.1% 18.8% 73.3%	38 24.4% 32.5% 76.0%	6 3.8% 5.1% 40.0%	117 75.0%
TOTAL	61 39.1%	30 19.2%	50 32.5%	15 9.6%	156 100.0%

Table 6.10: Chi-square test for comparisons.

Question/statement	Sample size	Chi-square	DF	P-value
Comparisons between new1 and Q03 (Entity type)				
1. Type of entity	156	12.2809	3	0.0065***

Statistically significant more SMEs that did not have a structured risk management approach were incorporated as sole proprietorship, partnership or closed corporation with sole proprietorship featuring the most.

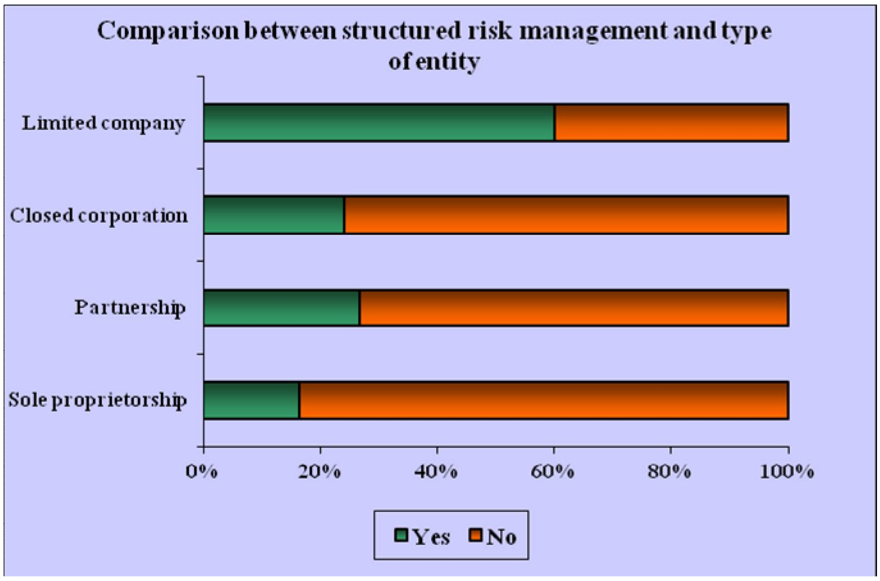

Figure 6.25: Comparison between structured risk management and type of entity.

Table 6.11: Contingency table – presence of structured/non-structured risk management approach compared to SME owner qualification.

Frequency/ Cell percentage/ Row percentage/ Column percentage/	Post-graduate degree	Post-matriculation (other /diploma /degree)	Up to matriculation certificate	TOTAL
Yes/presence	11 7.3% 29.0% 52.4%	21 13.9% 55.3% 24.4%	6 4.0% 15.8% 13.6%	38 25.2%
No/non-presence	10 6.6% 8.8% 47.6%	65 43.0% 57.5% 75.6%	38 25.2% 33.6% 86.4%	113 74.8%
TOTAL	21 13.9%	86 57.0%	44 29.1%	151 100.0%

Table 6.12: Chi-square test for comparisons.

Question/statement	Sample size	Chi-square	DF	P-value
Comparisons between new1 and Q05.1 (owner of SME's qualification)				
1. Owner of SME's qualification	151	11.3903	2	0.0034***

Statistically significant more owners of SMEs that did not have a structured risk management approach did not obtain any formal post-matriculation qualifications.

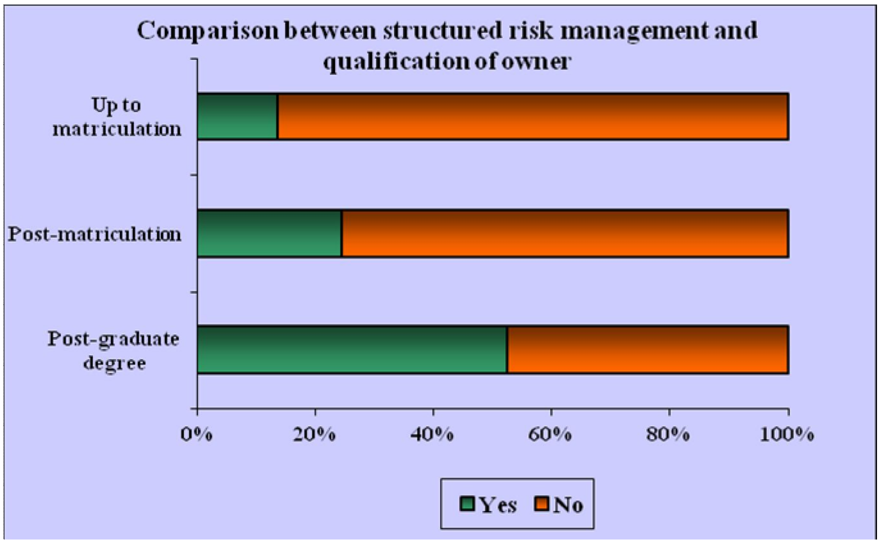

Figure 6.26: Comparison between structured risk management and qualification of owner.

Table 6.13: Contingency table – presence of structured/non-structured risk management approach compared to external support at marketing management (MM).

Frequency/ Cell percentage/ Row percentage/ Column percentage/	**Yes, received support**	**No, did not receive support**	**TOTAL**
Yes/presence	21 13.3% 52.5% 37.5%	19 12.0% 47.5% 18.6%	40 25.3%
No/non-presence	35 22.2% 29.7% 62.5%	83 52.5% 70.3% 81.4%	118 74.7%
TOTAL	56 35.4%	102 64.6%	158 100.0%

Table 6.14: Chi-square test for comparisons.

Question/statement	**Sample size**	**Chi-square**	**DF**	**P-value**
Comparisons between new1 and Q06.2 (external support to marketing management)				
1. External support to marketing management	158	6.8103	1	0.0091***

Statistically significant more SMEs that did not have a structured risk management approach did not have external support to their marketing management area.

Table 6.15: Contingency table – presence of structured/non-structured risk management approach compared to external support at human resource management (HRM).

Frequency/ Cell percentage/ Row percentage/ Column percentage/	Yes, received support	No, did not receive support	TOTAL
Yes/presence	12 7.6% 30.0% 48.0%	28 17.7% 70.0% 21.0%	40 25.3%
No/non-presence	13 8.2% 11.0% 52.0%	105 66.5% 89.0% 79.0%	118 74.7%
TOTAL	25 15.8%	133 84.2%	158 100.0%

Table 6.16: Chi-square test for comparisons.

Question/statement	Sample size	Chi-square	DF	P-value
Comparisons between new1 and Q06.6 (external support to human resource management)				
1. External support to human resource management	158	8.0824	1	0.0045***

Statistically significant more SMEs that did not have a structured risk management approach did not have external support to their human resource management area.

Table 6.17: Contingency table – presence of structured/non-structured risk management approach compared to external support at public relation management (PRM).

Frequency/ Cell percentage/ Row percentage/ Column percentage/	Yes, received support	No, did not receive support	TOTAL
Yes/presence	12 7.6% 30.0% 48.0%	28 17.7% 70.0% 21.0%	40 25.3%
No/non-presence	13 8.2% 11.0% 52.0%	105 66.5% 89.0% 79.0%	118 74.7%
TOTAL	25 15.8%	133 84.2%	158 100.0%

Table 6.18: Chi-square test for comparisons.

Question/statement	Sample size	Chi-square	DF	P-value
Comparisons between new1 and Q06.6 (external support to public relation management)				
1. External support to public relation management	158	8.0824	1	0.0045***

Statistically significant more SMEs that did not have a structured risk management approach did not have external support to their public relation management area.

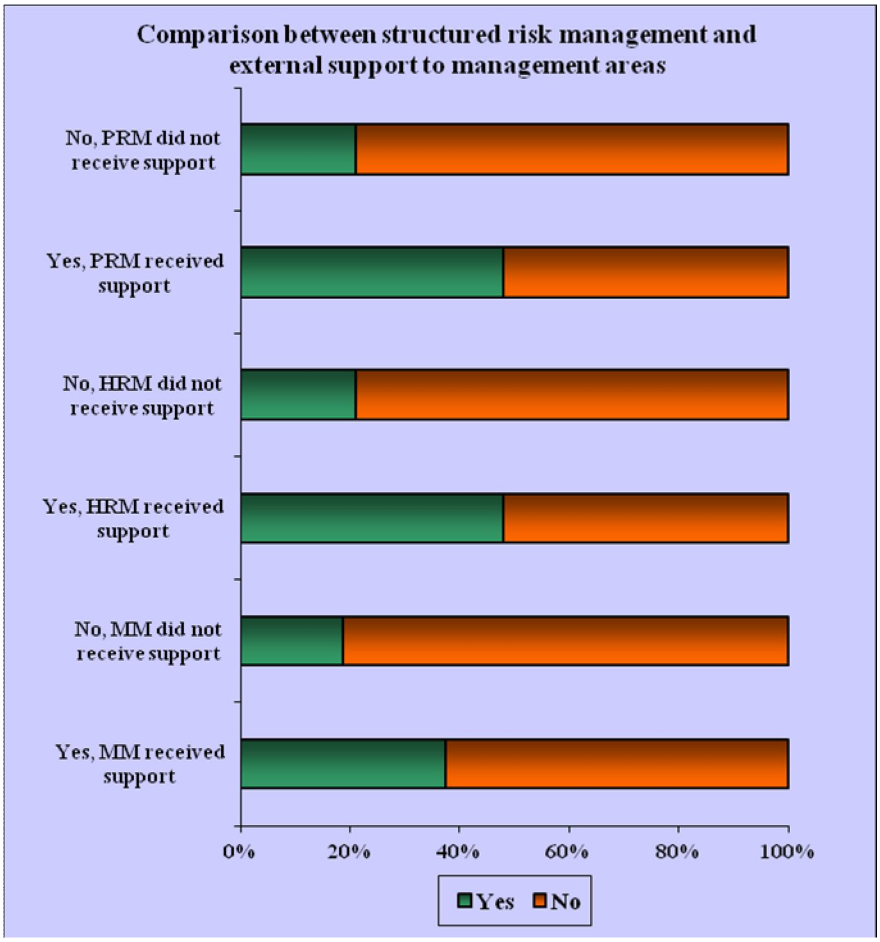

Figure 6.27: Comparison between structured risk management and external support to management areas.

Table 6.19: Contingency table – presence of structured/non-structured risk management approach compared to whether business objectives and strategies are clearly defined.

Frequency/ Cell percentage/ Row percentage/ Column percentage/	Yes, clearly defined	No, not clearly defined	TOTAL
Yes/presence	39 24.7% 97.5% 28.9%	1 0.6% 2.5% 4.4%	40 25.3%
No/non-presence	96 60.8% 81.4% 71.1%	22 13.9% 18.6% 95.6%	118 74.7%
TOTAL	135 85.4%	23 14.6%	158 100.0%

Table 6.20: Chi-square test for comparisons.

Question/statement	Sample size	Chi-square	DF	P-value
Comparisons between new1 and Q08 (whether business objectives and strategies are clearly defined)				
1. Whether business objectives and strategies are clearly defined	158	6.2598	1	0.0124*

Although most of the companies had their strategies and objectives clearly defined to help determine which activities are critical for the survival of their business enterprises, statistically significantly more SMEs that did not have a structured risk management approach did not have their strategies and objectives clearly defined.

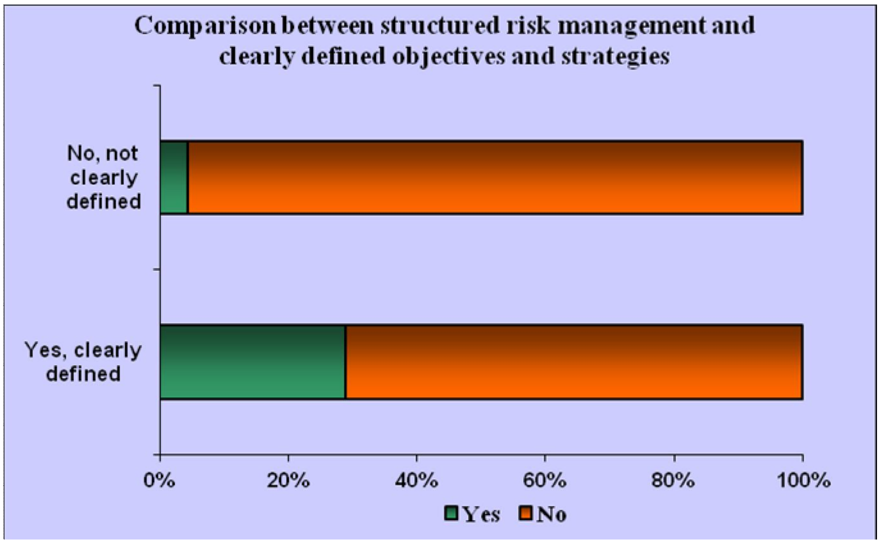

Figure 6.28: Comparison between structured risk management and clearly defined objectives and strategies

Table 6.21: Contingency table – presence of structured/non-structured risk management approach compared to understanding of risk.

Frequency/ Cell percentage/ Row percentage/ Column percentage/	Yes, understood impact	No, did not understand	TOTAL
Yes/presence	39 24.7% 97.5% 28.3%	1 0.6% 2.5% 5.0%	40 25.3%
No/non-presence	99 62.7% 83.9% 71.7%	19 12.0% 16.1% 95.0%	118 74.7%
TOTAL	138 87.3%	20 12.7%	158 100.0%

Table 6.22: Chi-square test for comparisons.

Question/statement	Sample size	Chi-square	DF	P-value
Comparisons between new1 and Q10 (understanding of risk)				
1. Understanding of risk that has an impact on business structure and processes	158	4.9999	1	0.0254*

Although most of the companies had an understanding of the risk that had an impact on their business structure and processes, statistically significantly more SMEs that did not have a structured risk management approach, did not have an understanding of that risk.

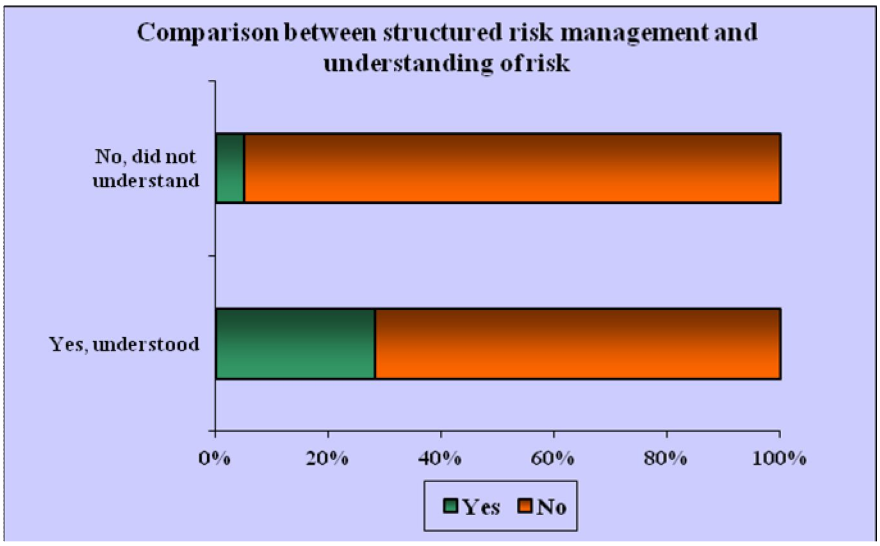

Figure 6.29: Comparison between structured risk management and understanding of risk.

Table 6.23: Contingency table – presence of structured/non-structured risk management approach compared to formal risk assessment in finance.

Frequency/ Cell percentage/ Row percentage/ Column percentage/	Yes, formal risk assessment took place	No, formal risk assessment did not take place	TOTAL
Yes/presence	36 22.8% 90.0% 31.0%	4 2.5% 10.0% 9.5%	40 25.3%
No/non-presence	80 50.6% 67.8% 69.0%	38 24.0% 32.2% 90.5%	118 74.7%
TOTAL	116 73.4%	42 26.6%	158 100.0%

Table 6.24: Chi-square test for comparisons.

Question/statement	Sample size	Chi-square	DF	P-value
Comparisons between new1 and Q17.1 (formal risk assessment)				
1. Formal risk identification or assessment takes place in the finance function	158	7.5462	1	0.0060***

Statistically significant more SMEs that did not have a structured risk management approach, did not have a formal risk identification and assessment at the finance function.

Table 6.25: Contingency table – presence of structured/non-structured risk management approach compared to formal risk assessment in human resources.

Frequency/ Cell percentage/ Row percentage/ Column percentage/	Yes, formal risk assessment took place	No, formal risk assessment did not take place	TOTAL
Yes/presence	20 12.7% 50.0% 51.3%	20 12.7 50.0% 16.8	40 25.3%
No/non-presence	19 12.0% 16.1% 48.7%	99 62.7% 83.9% 83.2%	118 74.7%
TOTAL	39 24.7%	119 75.3%	158 100.0%

Table 6.26: Chi-square test for comparisons.

Question/statement	Sample size	Chi-square	DF	P-value
Comparisons between new1 and Q17.3 (formal risk assessment)				
1. Formal risk identification or assessment takes place in the human resource function	158	18.4648	1	<0.0001***

Statistically significant more SMEs that did not have a structured risk management approach, did not have a formal risk identification and assessment at the human resource function.

Table 6.27: Contingency table – presence of structured/non-structured risk management approach compared to formal risk assessment in operational processes.

Frequency/ Cell percentage/ Row percentage/ Column percentage/	Yes, formal risk assessment took place	No, formal risk assessment did not take place	TOTAL
Yes/presence	28 17.7% 70.0% 31.5%	12 7.6% 30.0% 17.4%	40 25.3%
No/non-presence	61 38.6% 51.7% 68.5%	57 36.1% 48.3% 82.6%	118 74.7%
TOTAL	89 56.3%	69 43.7%	158 100.0%

Table 6.28: Chi-square test for comparisons.

Question/statement	Sample size	Chi-square	DF	P-value
Comparisons between new1 and Q17.4 (formal risk assessment)				
1. Formal risk identification or assessment takes place in the operational function	158	4.0691	1	0.0437*

Statistically significant more SMEs that did not have a structured risk management approach, did not have a formal risk identification and assessment in the operational function.

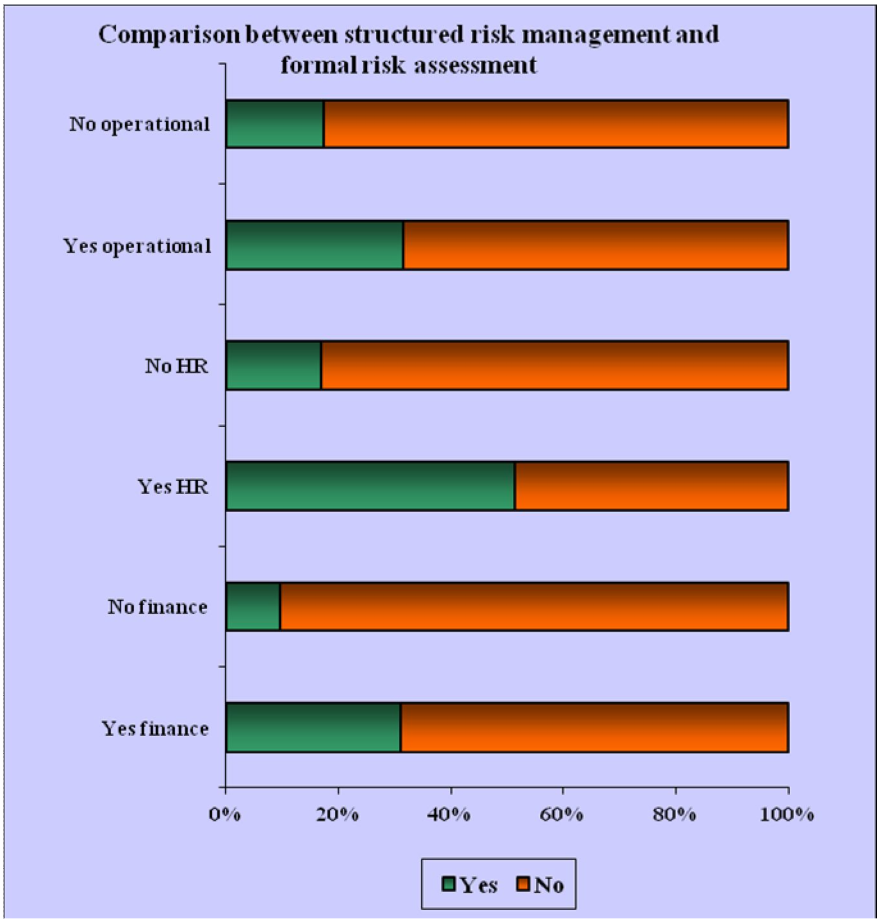

Figure 6.30: Comparison between structured risk management and formal risk assessment.

Table 6.29: Contingency table – presence of structured/non-structured risk management approach compared to improvement of internal controls.

Frequency/ Cell percentage/ Row percentage/ Column percentage/	Yes, improved internal controls	No, did not improve internal controls	TOTAL
Yes/presence	37 23.4% 92.5% 30.8%	3 1.9% 7.5% 7.9%	40 25.3%
No/non-presence	83 52.5% 70.3% 69.2%	35 22.2% 29.7% 92.1%	118 74.7%
TOTAL	120 76.0%	38 24.0%	158 100.0%

Table 6.30: Chi-square test for comparisons.

Question/statement	Sample size	Chi-square	DF	P-value
Comparisons between new1 and Q18.2 (improvement of internal controls)				
1. Improvement of internal controls	158	8.0318	1	0.0046***

Statistically significant more SMEs that did not have a structured risk management approach, did not have improvement of internal controls.

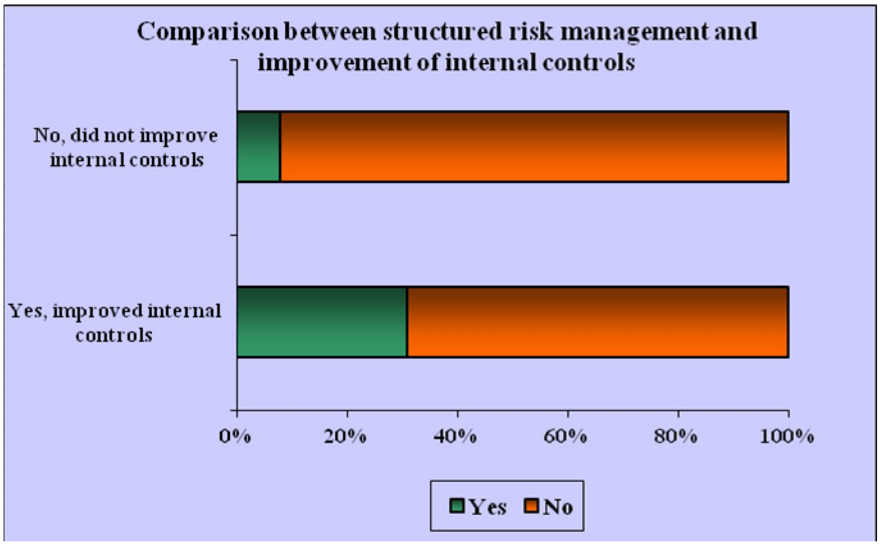

Figure 6.31: Comparison between structured risk management and improvement of internal controls.

Table 6.31: Contingency table – presence of structured/non-structured risk management approach compared to engagement in the identified activity.

Frequency/ Cell percentage/ Row percentage/ Column percentage/	Yes, did not engage	No, engaged	TOTAL
Yes/presence	2 1.3% 5.0% 6.2%	38 24.0% 95.0% 30.2%	40 25.3%
No/non-presence	30 19.0% 25.4% 94.0%	88 55.7% 74.6% 69.8%	118 74.7%
TOTAL	32 20.2%	126 79.8%	158 100.0%

Table 6.32: Chi-square test for comparisons.

Question/statement	Sample size	Chi-square	DF	P-value
Comparisons between new1 and Q18.3 (engagement of the identified activity)				
1. Do not engage in the identified activity	158	7.7152	1	0.0055***

Statistically significant more SMEs that did not have a structured risk management approach, did not engage in an identified risk activity.

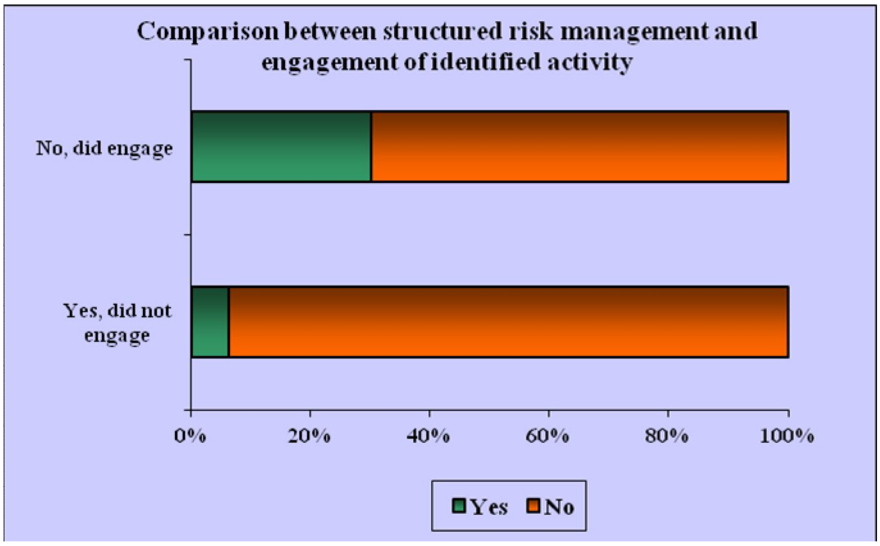

Figure 6.32: Comparison between structured risk management and engagement of identified activity.

Table 6.33: Contingency table – presence of structured/non-structured risk management approach compared to experiencing of obstacles.

Frequency/ Cell percentage/ Row percentage/ Column percentage/	Yes, experienced an obstacle	No, no obstacles experienced	TOTAL
Yes/presence	21 13.3% 52.5% 19.3%	19 12.0% 47.5% 38.8%	40 25.3%
No/non-presence	88 55.7% 74.6% 80.7%	30 19.0% 25.4% 61.2%	118 74.7%
TOTAL	109 69.0%	49 31.0%	158 100.0%

Table 6.34: Chi-square test for comparisons.

Question/statement	Sample size	Chi-square	DF	P-value
Comparisons between new1 and Q20.1 (experiencing obstacles)				
1. Experiencing obstacles	158	6.8050	1	0.0091***

Statistically significant more SMEs that did not have a structured risk management approach, experienced obstacles to implementing a risk management framework.

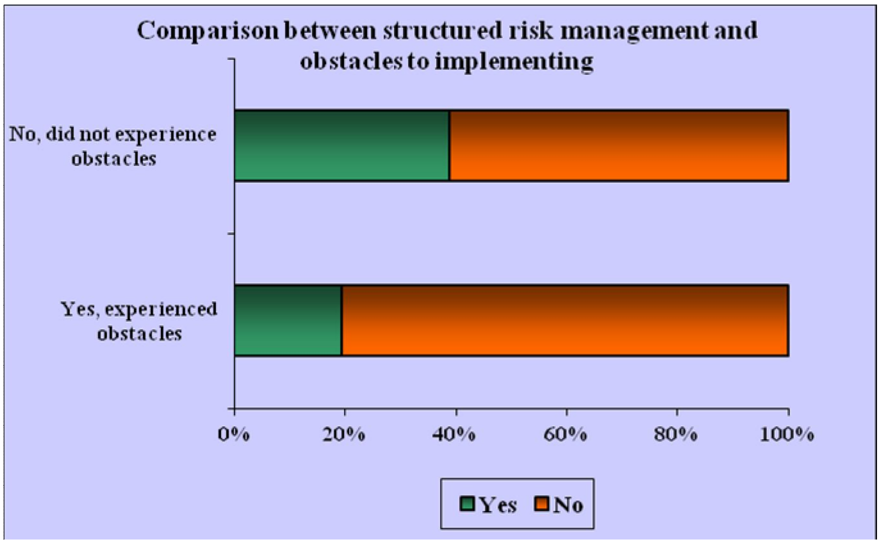

Figure 6.33: Comparison between structured risk management and obstacles to implementing.

Table 6.35: Contingency table – presence of structured/non-structured risk management approach compared to lack of intellectual capital.

Frequency/ Cell percentage/ Row percentage/ Column percentage/	Yes, lack of intellectual capital	No, no lack of intellectual capital	TOTAL
Yes/presence	7 4.4% 17.5% 14.9%	33 20.9% 82.5% 29.7%	40 25.3%
No/non-presence	40 25.3% 33.9% 85.1%	78 49.4% 66.1% 70.3%	118 74.7%
TOTAL	47 29.8%	111 70.2%	158 100.0%

Table 6.36: Chi-square test for comparisons.

Question/statement	Sample size	Chi-square	DF	P-value
Comparisons between new1 and Q20.5 (lack of intellectual capital)				
1. Lack of intellectual capital is an obstacle to implementing a RMF	158	3.8439	1	0.0499*

Statistically significant more SMEs that did not have a structured risk management approach, experienced that a lack of intellectual capital posed an obstacle when wanting to implement a risk management framework.

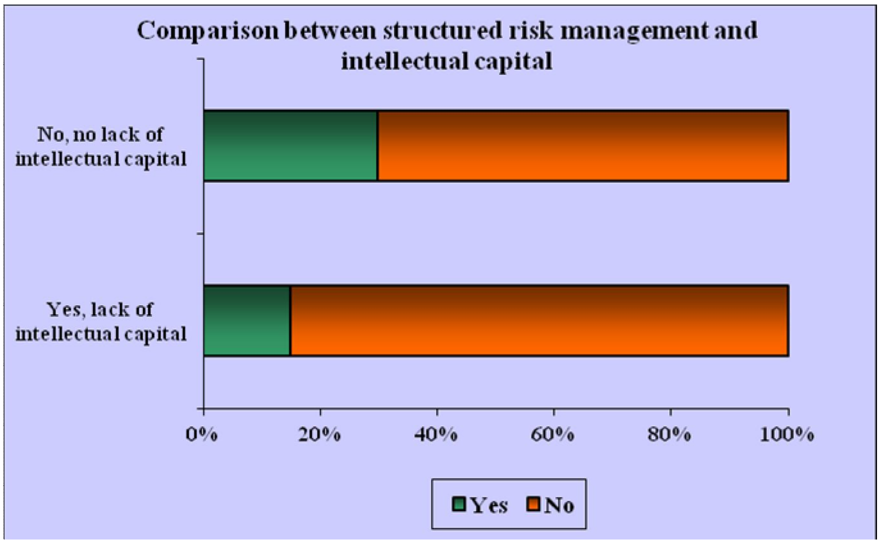

Figure 6.34: Comparison between structured risk management and intellectual capital.

Table 6.37: Contingency table – presence of structured/non-structured risk management approach compared to cost as an obstacle.

Frequency/ Cell percentage/ Row percentage/ Column percentage/	Yes, cost is an obstacle	No, cost is not an obstacle	TOTAL
Yes/presence	12 7.6% 30.0% 17.1%	28 17.7% 70.0% 31.8%	40 25.3%
No/non-presence	58 36.7% 49.2% 82.9%	60 38.0% 50.8% 68.2%	118 74.7%
TOTAL	70 44.3%	88 55.7%	158 100.0%

Table 6.38: Chi-square test for comparisons.

Question/statement	Sample size	Chi-square	DF	P-value
Comparisons between new1 and Q20.7 (Cost)				
1. Cost is an obstacle to implementing a RMF	158	4.4409	1	0.0351*

Statistically significant more SMEs that did not have a structured risk management approach, experienced cost as an obstacle to implementing a risk management framework.

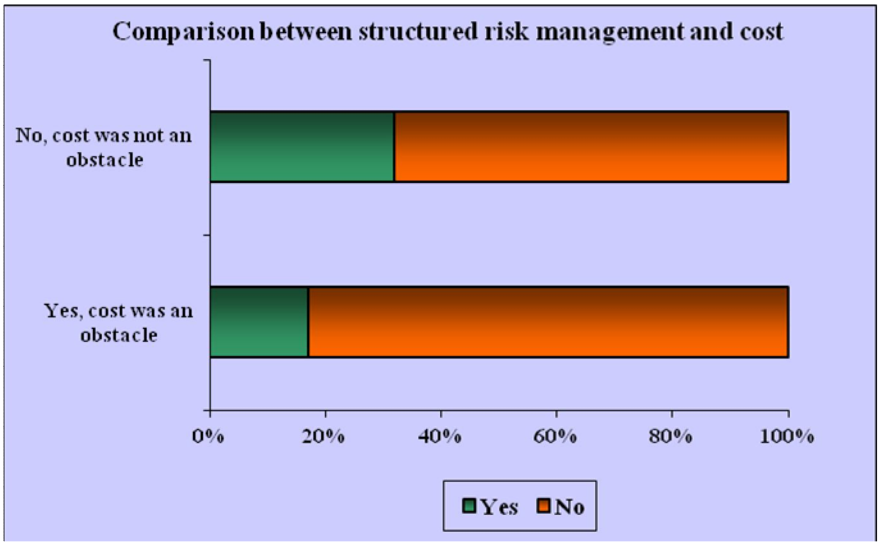

Figure 6.35: Comparison between structured risk management and cost.

Table 6.39: Contingency table – presence of structured/non-structured risk management approach compared to lack of skills as an obstacle.

Frequency/ Cell percentage/ Row percentage/ Column percentage/	Yes, formal risk assessment take place	No, formal risk assessment do not take place	TOTAL
Yes/presence	5 3.2% 12.5% 9.6%	35 22.2% 87.5% 33.0	40 25.3%
No/non-presence	47 30.0% 39.8% 90.4%	71 44.9% 60.2% 67.0%	118 74.7%
TOTAL	52 32.9%	106 67.1%	158 100.0%

Table 6.40: Chi-square test for comparisons.

Question/statement	Sample size	Chi-square	DF	P-value
Comparisons between new1 and Q20.8 (lack of skills as an obstacle)				
1. Lack of skills as an obstacle to implement a RMF	158	10.1061	1	0.0015***

Statistically significant more SMEs that did not have a structured risk management approach, experienced a lack of skills as an obstacle to implementing a risk management framework.

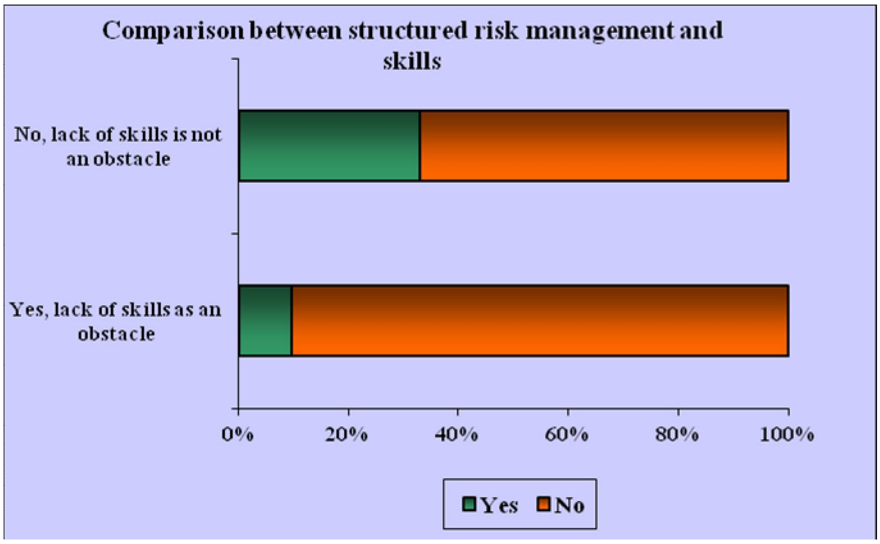

Figure 6.36: Comparison between structured risk management and skills.

Table 6.41: Contingency table – presence of structured/non-structured risk management approach compared to importance of management risk.

Frequency/ Cell percentage/ Row percentage/ Column percentage/	Most important	Important	Less important	Not so important	Least important	Total
Yes/presence	10 6.4% 25.0% 26.3%	9 5.7% 22.5% 33.3%	4 2.6% 10.0% 11.4%	6 3.8% 15.0% 18.2%	11 7.0% 27.5% 45.8%	40 25.5%
No/non-presence	28 17.8% 23.9% 73.7%	18 11.5% 15.4% 66.7%	31 19.8% 26.5% 88.6%	27 17.2% 23.1% 81.8%	13 8.3% 11.1% 54.2%	117 74.5%
TOTAL	38 24.2%	27 17.2%	35 22.3%	33 21.0%	24 15.3%	157 100.0%

Table 6.42: Chi-square test for comparisons.

Question/statement	Sample size	Chi-square	DF	P-value
Comparisons between new1 and Q09.1 (management risk)				
1. Importance of management risk	157	10.6929	4	0.0302*

Statistically significant more SMEs that do have a structured risk management approach, rate management risk as least important.

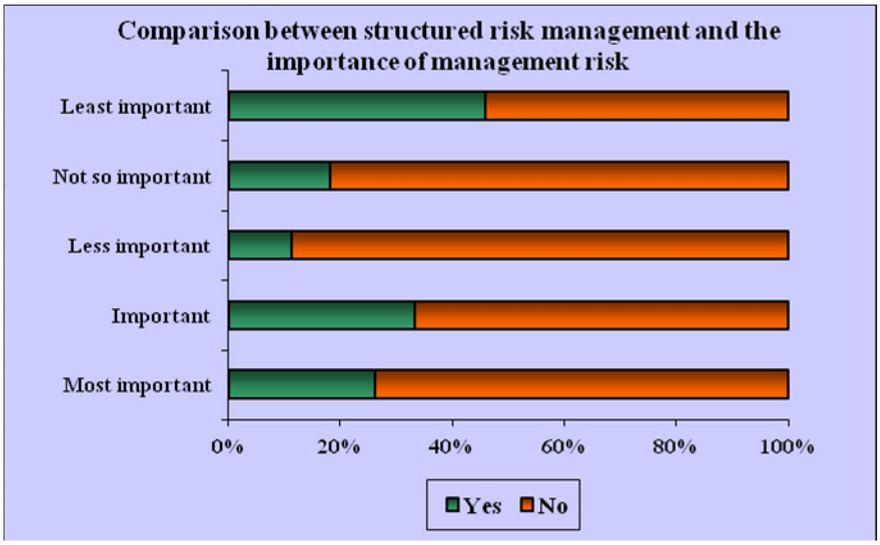

Figure 6.37: Comparison between structured risk management and the importance of management risk.

Table 6.43: Contingency table - presence of structured/non-structured risk management approach compared to importance of commercial risk.

Frequency/ Cell percentage/ Row percentage/ Column percentage/	Most important	Important	Less important	Not so important	Least important	Total
Yes/presence	8 5.1% 20.0% 22.9%	5 3.2% 12.5% 16.1%	13 8.3% 32.5% 30.2%	4 2.6% 10.0% 14.3%	10 6.4% 25.0% 50.0%	40 25.5%
No/non-presence	27 17.2% 23.1% 77.1%	26 16.6% 22.2% 83.9%	30 19.1% 25.6% 69.8%	24 15.3% 20.5% 85.7%	10 6.4% 8.6% 50.0%	117 74.5%
TOTAL	35 22.3%	31 19.8%	43 27.4%	28 17.8%	20 12.7%	157 100.0%

Table 6.44: Chi-square test for comparisons.

Question/statement	Sample size	Chi-square	DF	P-value
Comparisons between new1 and Q09.2 (commercial risk)				
1. Importance of commercial risk	157	10.2472	4	0.0365*

Statistically significant more SMEs that do have a structured risk management approach, rate commercial risk as least important.

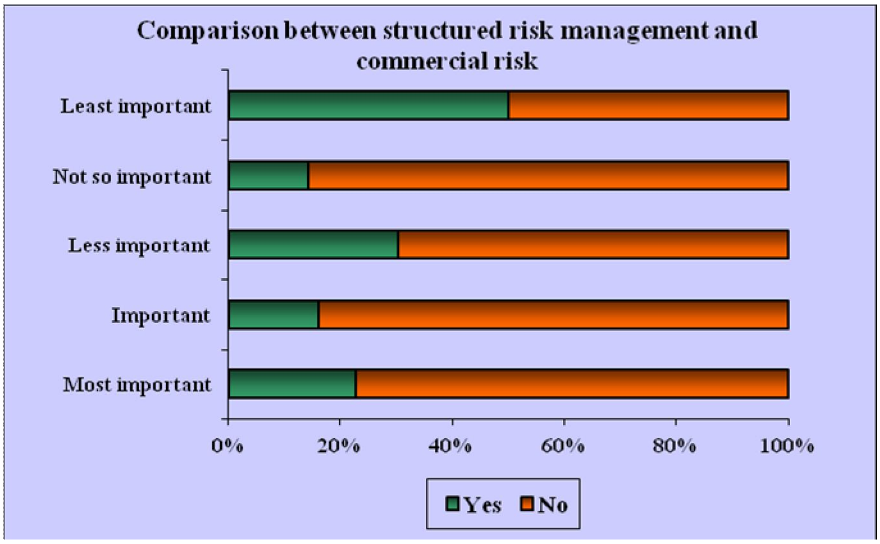

Figure 6.38: Comparison between structured risk management and commercial risk.

APPENDIX G

Contingency tables for new1 vs rest of variables

```
                 Table of new1 by Q01
         Frequency,
         Percent  ,
         Row Pct  ,
         Col Pct  ,>R500 00,<=R500 0,  Total
                  ,0       ,00      ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Yes      ,     24 ,     16 ,     40
                  ,  15.19 ,  10.13 ,  25.32
                  ,  60.00 ,  40.00 ,
                  ,  36.92 ,  17.20 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         No       ,     41 ,     77 ,    118
                  ,  25.95 ,  48.73 ,  74.68
                  ,  34.75 ,  65.25 ,
                  ,  63.08 ,  82.80 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Total          65       93      158
                     41.14    58.86   100.00

         Statistics for Table of new1 by Q01
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                     1      7.8681    0.0050
Likelihood Ratio Chi-Square    1      7.7826    0.0053
Continuity Adj. Chi-Square     1      6.8598    0.0088
Mantel-Haenszel Chi-Square     1      7.8183    0.0052
Phi Coefficient                       0.2232
Contingency Coefficient               0.2178
Cramer's V                            0.2232
                 Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)        24
          Left-sided Pr <= F          0.9985
          Right-sided Pr >= F         0.0046
          Table Probability (P)       0.0031
          Two-sided Pr <= P           0.0087
                  Sample Size = 158

                 Table of new1 by Q02
         Frequency,
         Percent  ,
         Row Pct  ,
         Col Pct  ,>10     ,<=10    ,  Total
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Yes      ,     22 ,     18 ,     40
                  ,  13.92 ,  11.39 ,  25.32
                  ,  55.00 ,  45.00 ,
                  ,  39.29 ,  17.65 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         No       ,     34 ,     84 ,    118
                  ,  21.52 ,  53.16 ,  74.68
                  ,  28.81 ,  71.19 ,
                  ,  60.71 ,  82.35 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Total          56      102      158
                     35.44    64.56   100.00

         Statistics for Table of new1 by Q02
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                     1      8.9529    0.0028
Likelihood Ratio Chi-Square    1      8.6832    0.0032
Continuity Adj. Chi-Square     1      7.8450    0.0051
Mantel-Haenszel Chi-Square     1      8.8962    0.0029
Phi Coefficient                       0.2380
Contingency Coefficient               0.2316
Cramer's V                            0.2380
                 Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)        22
          Left-sided Pr <= F          0.9992
          Right-sided Pr >= F         0.0028
          Table Probability (P)       0.0020
          Two-sided Pr <= P           0.0040
                  Sample Size = 158

                 Table of new1 by Q03
Frequency,
Percent  ,
Row Pct  ,
Col Pct  ,Sole pro,Partners,Close Co,Limited ,  Total
         ,prietors,hip     ,rporatio,Company ,
         ,hip     ,        ,n       ,        ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Yes      ,     10 ,      8 ,     12 ,      9 ,     39
         ,   6.41 ,   5.13 ,   7.69 ,   5.77 ,  25.00
         ,  25.64 ,  20.51 ,  30.77 ,  23.08 ,
         ,  16.39 ,  26.67 ,  24.00 ,  60.00 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
No       ,     51 ,     22 ,     38 ,      6 ,    117
```

```
         ,  32.69 ,  14.10 ,  24.36 ,   3.85 ,  75.00
         ,  43.59 ,  18.80 ,  32.48 ,   5.13 ,
         ,  83.61 ,  73.33 ,  76.00 ,  40.00 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Total          61       30       50       15      156
            39.10    19.23    32.05     9.62   100.00

         Statistics for Table of new1 by Q03
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                     3     12.2809    0.0065
Likelihood Ratio Chi-Square    3     10.9266    0.0121
Mantel-Haenszel Chi-Square     1      7.3058    0.0069
Phi Coefficient                       0.2806
Contingency Coefficient               0.2701
Cramer's V                            0.2806
             Effective Sample Size = 156
                Frequency Missing = 2


                 Table of new1 by Q04
         Frequency,
         Percent  ,
         Row Pct  ,
         Col Pct  ,> 10 yea,<=10 yea,  Total
                  ,rs      ,rs      ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Yes      ,     14 ,     26 ,     40
                  ,   8.86 ,  16.46 ,  25.32
                  ,  35.00 ,  65.00 ,
                  ,  36.84 ,  21.67 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         No       ,     24 ,     94 ,    118
                  ,  15.19 ,  59.49 ,  74.68
                  ,  20.34 ,  79.66 ,
                  ,  63.16 ,  78.33 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Total          38      120      158
                     24.05    75.95   100.00

         Statistics for Table of new1 by Q04
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                     1      3.5153    0.0608
Likelihood Ratio Chi-Square    1      3.3342    0.0679
Continuity Adj. Chi-Square     1      2.7585    0.0967
Mantel-Haenszel Chi-Square     1      3.4931    0.0616
Phi Coefficient                       0.1492
Contingency Coefficient               0.1475
Cramer's V                            0.1492

                 Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)        14
          Left-sided Pr <= F          0.9795
          Right-sided Pr >= F         0.0509

          Table Probability (P)       0.0304
          Two-sided Pr <= P           0.0855
                  Sample Size = 158

                Table of new1 by Q05_1
     Frequency,
     Percent  ,
     Row Pct  ,
     Col Pct  ,Post gra,Post mat,None to ,  Total
              ,duate de,riculati,Matricul,
              ,gree    ,on (Othe,ation Ce,
              ,        ,r, Diplo,rtificat,
              ,        ,ma, Degr,e       ,
              ,        ,ee)     ,        ,
     ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
     Yes      ,     11 ,     21 ,      6 ,     38
              ,   7.28 ,  13.91 ,   3.97 ,  25.17
              ,  28.95 ,  55.26 ,  15.79 ,
              ,  52.38 ,  24.42 ,  13.64 ,
     ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
     No       ,     10 ,     65 ,     38 ,    113
              ,   6.62 ,  43.05 ,  25.17 ,  74.83
              ,   8.85 ,  57.52 ,  33.63 ,
              ,  47.62 ,  75.58 ,  86.36 ,
     ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
     Total          21       86       44      151
                 13.91    56.95    29.14   100.00

        Statistics for Table of new1 by Q05_1
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                     2     11.3903    0.0034
Likelihood Ratio Chi-Square    2     10.6493    0.0049
Mantel-Haenszel Chi-Square     1      6.8918    0.0087
Phi Coefficient                       0.2746
Contingency Coefficient               0.2648
Cramer's V                            0.2746
             Effective Sample Size = 151
                Frequency Missing = 7

                Table of new1 by Q05_2
     Frequency,
     Percent  ,
```

```
     Row Pct  ,
     Col Pct  ,Post gra,Post mat,None to ,  Total
              ,duate de,riculati,Matricul,
              ,gree    ,on (Othe,ation Ce,
              ,        ,r, Diplo,rtificat,
              ,        ,ma, Degr,e       ,
              ,        ,ee)     ,        ,
     ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
     Yes      ,      6 ,     24 ,      7 ,     37
              ,   4.08 ,  16.33 ,   4.76 ,  25.17
              ,  16.22 ,  64.86 ,  18.92 ,
              ,  40.00 ,  27.91 ,  15.22 ,
     ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
     No       ,      9 ,     62 ,     39 ,    110
              ,   6.12 ,  42.18 ,  26.53 ,  74.83
              ,   8.18 ,  56.36 ,  35.45 ,
              ,  60.00 ,  72.09 ,  84.78 ,
     ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
     Total          15       86       46      147
                 10.20    58.50    31.29   100.00

        Statistics for Table of new1 by Q05_2
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                     2      4.5128    0.1047
Likelihood Ratio Chi-Square    2      4.6123    0.0996
Mantel-Haenszel Chi-Square     1      4.1188    0.0424
Phi Coefficient                       0.1752
Contingency Coefficient               0.1726
Cramer's V                            0.1752
             Effective Sample Size = 147
                Frequency Missing = 11
```

```
              Table of new1 by Q06_01
        Frequency,
        Percent  ,
        Row Pct  ,
        Col Pct  ,Yes     ,No      ,  Total
        ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
        Yes      ,     18 ,     22 ,     40
                 ,  11.39 ,  13.92 ,  25.32
                 ,  45.00 ,  55.00 ,
                 ,  29.03 ,  22.92 ,
        ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
        No       ,     44 ,     74 ,    118
                 ,  27.85 ,  46.84 ,  74.68
                 ,  37.29 ,  62.71 ,
                 ,  70.97 ,  77.08 ,
        ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
        Total          62       96      158
                    39.24    60.76   100.00

       Statistics for Table of new1 by Q06_01
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                     1      0.7452    0.3880
Likelihood Ratio Chi-Square    1      0.7382    0.3903
Continuity Adj. Chi-Square     1      0.4568    0.4991
Mantel-Haenszel Chi-Square     1      0.7405    0.3895
Phi Coefficient                       0.0687
Contingency Coefficient               0.0685
Cramer's V                            0.0687

                Fisher's Exact Test
         ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
         Cell (1,1) Frequency (F)        18
         Left-sided Pr <= F          0.8532
         Right-sided Pr >= F         0.2485
         Table Probability (P)       0.1017
         Two-sided Pr <= P           0.4546
                 Sample Size = 158

              Table of new1 by Q06_02
        Frequency,
        Percent  ,
        Row Pct  ,
        Col Pct  ,Yes     ,No      ,  Total
        ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
        Yes      ,     21 ,     19 ,     40
                 ,  13.29 ,  12.03 ,  25.32
                 ,  52.50 ,  47.50 ,
                 ,  37.50 ,  18.63 ,
        ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
        No       ,     35 ,     83 ,    118
                 ,  22.15 ,  52.53 ,  74.68
                 ,  29.66 ,  70.34 ,
                 ,  62.50 ,  81.37 ,
        ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
        Total          56      102      158
                    35.44    64.56   100.00

       Statistics for Table of new1 by Q06_02
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                     1      6.8103    0.0091
Likelihood Ratio Chi-Square    1      6.6148    0.0101
Continuity Adj. Chi-Square     1      5.8487    0.0156
Mantel-Haenszel Chi-Square     1      6.7672    0.0093
Phi Coefficient                       0.2076
Contingency Coefficient               0.2033
Cramer's V                            0.2076

                Fisher's Exact Test
         ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
         Cell (1,1) Frequency (F)        21
         Left-sided Pr <= F          0.9972
         Right-sided Pr >= F         0.0084
         Table Probability (P)       0.0056
         Two-sided Pr <= P           0.0126
                 Sample Size = 158

              Table of new1 by Q06_03
        Frequency,
        Percent  ,
        Row Pct  ,
        Col Pct  ,Yes     ,No      ,  Total
        ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
        Yes      ,     10 ,     30 ,     40
                 ,   6.33 ,  18.99 ,  25.32
                 ,  25.00 ,  75.00 ,
                 ,  34.48 ,  23.26 ,
        ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
        No       ,     19 ,     99 ,    118
                 ,  12.03 ,  62.66 ,  74.68
                 ,  16.10 ,  83.90 ,
                 ,  65.52 ,  76.74 ,
        ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
        Total          29      129      158
                    18.35    81.65   100.00

       Statistics for Table of new1 by Q06_03
Statistic                     DF       Value      Prob
```

```
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                    1      1.5784    0.2090
Likelihood Ratio Chi-Square    1      1.4993    0.2208
Continuity Adj. Chi-Square     1      1.0405    0.3077
Mantel-Haenszel Chi-Square     1      1.5684    0.2104
Phi Coefficient                      0.1000
Contingency Coefficient              0.0995
Cramer's V                           0.1000
                 Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)       10
          Left-sided Pr <= F          0.9292
          Right-sided Pr >= F         0.1538
          Table Probability (P)       0.0830
          Two-sided Pr <= P           0.2393
                  Sample Size = 158

               Table of new1 by Q06_04
         Frequency,
         Percent  ,
         Row Pct  ,
         Col Pct  ,Yes     ,No      ,  Total
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Yes      ,     11 ,     29 ,     40
                  ,   6.96 ,  18.35 ,  25.32
                  ,  27.50 ,  72.50 ,
                  ,  37.93 ,  22.48 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         No       ,     18 ,    100 ,    118
                  ,  11.39 ,  63.29 ,  74.68
                  ,  15.25 ,  84.75 ,
                  ,  62.07 ,  77.52 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Total          29      129      158
                     18.35    81.65   100.00

        Statistics for Table of new1 by Q06_04
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                    1      2.9894    0.0838
Likelihood Ratio Chi-Square    1      2.7976    0.0944
Continuity Adj. Chi-Square     1      2.2281    0.1355
Mantel-Haenszel Chi-Square     1      2.9705    0.0848
Phi Coefficient                      0.1376
Contingency Coefficient              0.1363
Cramer's V                           0.1376
                 Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)       11
          Left-sided Pr <= F          0.9722
          Right-sided Pr >= F         0.0708
          Table Probability (P)       0.0430
          Two-sided Pr <= P           0.0997
                  Sample Size = 158

               Table of new1 by Q06_05
         Frequency,
         Percent  ,
         Row Pct  ,
         Col Pct  ,Yes     ,No      ,  Total
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Yes      ,     18 ,     22 ,     40
                  ,  11.39 ,  13.92 ,  25.32
                  ,  45.00 ,  55.00 ,
                  ,  34.62 ,  20.75 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         No       ,     34 ,     84 ,    118
                  ,  21.52 ,  53.16 ,  74.68
                  ,  28.81 ,  71.19 ,
                  ,  65.38 ,  79.25 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Total          52      106      158
                     32.91    67.09   100.00

        Statistics for Table of new1 by Q06_05
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                    1      3.5448    0.0597
Likelihood Ratio Chi-Square    1      3.4387    0.0637
Continuity Adj. Chi-Square     1      2.8496    0.0914
Mantel-Haenszel Chi-Square     1      3.5224    0.0605
Phi Coefficient                      0.1498
Contingency Coefficient              0.1481
Cramer's V                           0.1498
                 Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)       18
          Left-sided Pr <= F          0.9799
          Right-sided Pr >= F         0.0472
          Table Probability (P)       0.0271
          Two-sided Pr <= P           0.0793
                  Sample Size = 158

               Table of new1 by Q06_06
         Frequency,
         Percent  ,
         Row Pct  ,
         Col Pct  ,Yes     ,No      ,  Total
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
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         Yes      ,     12 ,     28 ,     40
                  ,   7.59 ,  17.72 ,  25.32
                  ,  30.00 ,  70.00 ,
                  ,  48.00 ,  21.05 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         No       ,     13 ,    105 ,    118
                  ,   8.23 ,  66.46 ,  74.68
                  ,  11.02 ,  88.98 ,
                  ,  52.00 ,  78.95 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Total          25      133      158
                     15.82    84.18   100.00

        Statistics for Table of new1 by Q06_06
Statistic                      DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                      1      8.0824    0.0045
Likelihood Ratio Chi-Square     1      7.2730    0.0070
Continuity Adj. Chi-Square      1      6.7200    0.0095
Mantel-Haenszel Chi-Square      1      8.0312    0.0046
Phi Coefficient                        0.2262
Contingency Coefficient                0.2206
Cramer's V                             0.2262

                 Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)        12
          Left-sided Pr <= F          0.9984
          Right-sided Pr >= F         0.0064
          Table Probability (P)       0.0048
          Two-sided Pr <= P           0.0102
                  Sample Size = 158

               Table of new1 by Q06_07
         Frequency,
         Percent  ,
         Row Pct  ,
         Col Pct  ,Yes     ,No      ,  Total
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Yes      ,     12 ,     28 ,     40
                  ,   7.59 ,  17.72 ,  25.32
                  ,  30.00 ,  70.00 ,
                  ,  48.00 ,  21.05 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         No       ,     13 ,    105 ,    118
                  ,   8.23 ,  66.46 ,  74.68
                  ,  11.02 ,  88.98 ,
                  ,  52.00 ,  78.95 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Total          25      133      158
                     15.82    84.18   100.00

        Statistics for Table of new1 by Q06_07
Statistic                      DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                      1      8.0824    0.0045
Likelihood Ratio Chi-Square     1      7.2730    0.0070
Continuity Adj. Chi-Square      1      6.7200    0.0095
Mantel-Haenszel Chi-Square      1      8.0312    0.0046
Phi Coefficient                        0.2262
Contingency Coefficient                0.2206
Cramer's V                             0.2262

                 Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)        12
          Left-sided Pr <= F          0.9984
          Right-sided Pr >= F         0.0064
          Table Probability (P)       0.0048
          Two-sided Pr <= P           0.0102
                  Sample Size = 158

               Table of new1 by q06_08n
         Frequency,
         Percent  ,
         Row Pct  ,
         Col Pct  ,Yes     ,No      ,  Total
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Yes      ,     29 ,     11 ,     40
                  ,  18.35 ,   6.96 ,  25.32
                  ,  72.50 ,  27.50 ,
                  ,  27.36 ,  21.15 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         No       ,     77 ,     41 ,    118
                  ,  48.73 ,  25.95 ,  74.68
                  ,  65.25 ,  34.75 ,
                  ,  72.64 ,  78.85 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Total         106       52      158
                     67.09    32.91   100.00

       Statistics for Table of new1 by q06_08n
Statistic                      DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                      1      0.7103    0.3993
Likelihood Ratio Chi-Square     1      0.7255    0.3944
Continuity Adj. Chi-Square      1      0.4201    0.5169
Mantel-Haenszel Chi-Square      1      0.7058    0.4008
Phi Coefficient                        0.0671
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Contingency Coefficient              0.0669
Cramer's V                           0.0671

                 Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)        29
          Left-sided Pr <= F          0.8505
          Right-sided Pr >= F         0.2608
          Table Probability (P)       0.1112
          Two-sided Pr <= P           0.4419
                  Sample Size = 158
               Table of new1 by Q06_09
         Frequency,
         Percent  ,
         Row Pct  ,
         Col Pct  ,Yes     ,No      ,  Total
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Yes      ,      0 ,     40 ,     40
                  ,   0.00 ,  25.32 ,  25.32
                  ,   0.00 , 100.00 ,
                  ,   0.00 ,  25.81 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         No       ,      3 ,    115 ,    118
                  ,   1.90 ,  72.78 ,  74.68
                  ,   2.54 ,  97.46 ,
                  , 100.00 ,  74.19 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Total           3      155      158
                      1.90    98.10   100.00

        Statistics for Table of new1 by Q06_09
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                     1      1.0366    0.3086
Likelihood Ratio Chi-Square    1      1.7711    0.1833
Continuity Adj. Chi-Square     1      0.1210    0.7279
Mantel-Haenszel Chi-Square     1      1.0301    0.3101
Phi Coefficient                      -0.0810
Contingency Coefficient               0.0807
Cramer's V                           -0.0810
 WARNING: 50% of the cells have expected counts less
          than 5. Chi-Square may not be a valid test.
                 Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)         0
          Left-sided Pr <= F          0.4139
          Right-sided Pr >= F         1.0000
          Table Probability (P)       0.4139
          Two-sided Pr <= P           0.5719
                  Sample Size = 158

              Table of new1 by q07_1_1n
         Frequency,
         Percent  ,
         Row Pct  ,
         Col Pct  ,Yes     ,No      ,  Total
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Yes      ,     21 ,     19 ,     40
                  ,  13.29 ,  12.03 ,  25.32
                  ,  52.50 ,  47.50 ,
                  ,  21.65 ,  31.15 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         No       ,     76 ,     42 ,    118
                  ,  48.10 ,  26.58 ,  74.68
                  ,  64.41 ,  35.59 ,
                  ,  78.35 ,  68.85 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Total          97       61      158
                     61.39    38.61   100.00

       Statistics for Table of new1 by q07_1_1n
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                     1      1.7868    0.1813
Likelihood Ratio Chi-Square    1      1.7619    0.1844
Continuity Adj. Chi-Square     1      1.3198    0.2506
Mantel-Haenszel Chi-Square     1      1.7755    0.1827
Phi Coefficient                      -0.1063
Contingency Coefficient               0.1057
Cramer's V                           -0.1063
                 Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)        21
          Left-sided Pr <= F          0.1257
          Right-sided Pr >= F         0.9355
          Table Probability (P)       0.0612
          Two-sided Pr <= P           0.1934
                  Sample Size = 158
              Table of new1 by Q07_2_01
         Frequency,
         Percent  ,
         Row Pct  ,
         Col Pct  ,Yes     ,No      ,  Total
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Yes      ,     10 ,     30 ,     40
                  ,   6.33 ,  18.99 ,  25.32
                  ,  25.00 ,  75.00 ,
                  ,  28.57 ,  24.39 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
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         No       ,     25 ,     93 ,    118
                  ,  15.82 ,  58.86 ,  74.68
                  ,  21.19 ,  78.81 ,
                  ,  71.43 ,  75.61 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Total          35      123      158
                     22.15    77.85   100.00

       Statistics for Table of new1 by Q07_2_01
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                     1      0.2519    0.6157
Likelihood Ratio Chi-Square    1      0.2472    0.6190
Continuity Adj. Chi-Square     1      0.0793    0.7782
Mantel-Haenszel Chi-Square     1      0.2503    0.6168
Phi Coefficient                       0.0399
Contingency Coefficient               0.0399
Cramer's V                            0.0399
                 Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)        10
          Left-sided Pr <= F          0.7678
          Right-sided Pr >= F         0.3821
          Table Probability (P)       0.1499
          Two-sided Pr <= P           0.6613
                  Sample Size = 158

              Table of new1 by Q07_2_02
         Frequency,
         Percent  ,
         Row Pct  ,
         Col Pct  ,Yes     ,No      ,  Total
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Yes      ,      7 ,     33 ,     40
                  ,   4.43 ,  20.89 ,  25.32
                  ,  17.50 ,  82.50 ,
                  ,  15.91 ,  28.95 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         No       ,     37 ,     81 ,    118
                  ,  23.42 ,  51.27 ,  74.68
                  ,  31.36 ,  68.64 ,
                  ,  84.09 ,  71.05 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Total          44      114      158
                     27.85    72.15   100.00

       Statistics for Table of new1 by Q07_2_02
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                     1      2.8544    0.0911
Likelihood Ratio Chi-Square    1      3.0471    0.0809
Continuity Adj. Chi-Square     1      2.2064    0.1374
Mantel-Haenszel Chi-Square     1      2.8363    0.0922
Phi Coefficient                      -0.1344
Contingency Coefficient               0.1332
Cramer's V                           -0.1344
                 Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)         7
          Left-sided Pr <= F          0.0657
          Right-sided Pr >= F         0.9742
          Table Probability (P)       0.0399
          Two-sided Pr <= P           0.1053
                  Sample Size = 158
```

```
     Table of new1 by Q07_2_03
Frequency,
Percent  ,
Row Pct  ,
Col Pct  ,Yes     ,No      ,  Total
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Yes      ,     12 ,     28 ,     40
         ,   7.59 ,  17.72 ,  25.32
         ,  30.00 ,  70.00 ,
         ,  19.67 ,  28.87 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
No       ,     49 ,     69 ,    118
         ,  31.01 ,  43.67 ,  74.68
         ,  41.53 ,  58.47 ,
         ,  80.33 ,  71.13 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Total          61       97      158
            38.61    61.39   100.00

      Statistics for Table of new1 by Q07_2_03
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                     1      1.6742    0.1957
Likelihood Ratio Chi-Square    1      1.7139    0.1905
Continuity Adj. Chi-Square     1      1.2233    0.2687
Mantel-Haenszel Chi-Square     1      1.6636    0.1971
Phi Coefficient                      -0.1029
Contingency Coefficient               0.1024
Cramer's V                           -0.1029
                 Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)        12
          Left-sided Pr <= F          0.1340
          Right-sided Pr >= F         0.9323
          Table Probability (P)       0.0662
          Two-sided Pr <= P           0.2596
                 Sample Size = 158


     Table of new1 by Q07_2_04
Frequency,
Percent  ,
Row Pct  ,
Col Pct  ,Yes     ,No      ,  Total
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Yes      ,      8 ,     32 ,     40
         ,   5.06 ,  20.25 ,  25.32
         ,  20.00 ,  80.00 ,
         ,  26.67 ,  25.00 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
No       ,     22 ,     96 ,    118
         ,  13.92 ,  60.76 ,  74.68
         ,  18.64 ,  81.36 ,
         ,  73.33 ,  75.00 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Total          30      128      158
            18.99    81.01   100.00

      Statistics for Table of new1 by Q07_2_04
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                     1      0.0357    0.8501
Likelihood Ratio Chi-Square    1      0.0354    0.8508
Continuity Adj. Chi-Square     1      0.0000    1.0000
Mantel-Haenszel Chi-Square     1      0.0355    0.8506
Phi Coefficient                       0.0150
Contingency Coefficient               0.0150
Cramer's V                            0.0150
                 Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)         8
          Left-sided Pr <= F          0.6705
          Right-sided Pr >= F         0.5079
          Table Probability (P)       0.1784
          Two-sided Pr <= P           0.8195
                 Sample Size = 158

     Table of new1 by Q07_2_05
Frequency,
Percent  ,
Row Pct  ,
Col Pct  ,Yes     ,No      ,  Total
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Yes      ,      7 ,     33 ,     40
         ,   4.43 ,  20.89 ,  25.32
         ,  17.50 ,  82.50 ,
         ,  21.88 ,  26.19 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
No       ,     25 ,     93 ,    118
         ,  15.82 ,  58.86 ,  74.68
         ,  21.19 ,  78.81 ,
         ,  78.13 ,  73.81 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Total          32      126      158
            20.25    79.75   100.00

      Statistics for Table of new1 by Q07_2_05
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
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Chi-Square                      1      0.2514    0.6161
Likelihood Ratio Chi-Square     1      0.2575    0.6118
Continuity Adj. Chi-Square      1      0.0749    0.7843
Mantel-Haenszel Chi-Square      1      0.2498    0.6172
Phi Coefficient                       -0.0399
Contingency Coefficient                0.0399
Cramer's V                            -0.0399
                 Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)         7
          Left-sided Pr <= F          0.4006
          Right-sided Pr >= F         0.7633
          Table Probability (P)       0.1639
          Two-sided Pr <= P           0.8201
                  Sample Size = 158

              Table of new1 by Q07_2_06
         Frequency,
         Percent  ,
         Row Pct  ,
         Col Pct  ,Yes     ,No      ,  Total
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Yes      ,      8 ,     32 ,     40
                  ,   5.06 ,  20.25 ,  25.32
                  ,  20.00 ,  80.00 ,
                  ,  22.22 ,  26.23 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         No       ,     28 ,     90 ,    118
                  ,  17.72 ,  56.96 ,  74.68
                  ,  23.73 ,  76.27 ,
                  ,  77.78 ,  73.77 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Total          36      122      158
                     22.78    77.22   100.00

       Statistics for Table of new1 by Q07_2_06
Statistic                      DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                      1      0.2361    0.6270
Likelihood Ratio Chi-Square     1      0.2410    0.6235
Continuity Adj. Chi-Square      1      0.0717    0.7889
Mantel-Haenszel Chi-Square      1      0.2346    0.6281
Phi Coefficient                       -0.0387
Contingency Coefficient                0.0386
Cramer's V                            -0.0387
                 Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)         8
          Left-sided Pr <= F          0.4018
          Right-sided Pr >= F         0.7558
          Table Probability (P)       0.1576
          Two-sided Pr <= P           0.8275
                  Sample Size = 158
```

```
     Table of new1 by Q07_2_07
Frequency,
Percent  ,
Row Pct  ,
Col Pct  ,Yes     ,No      ,  Total
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Yes      ,      3 ,     37 ,     40
         ,   1.90 ,  23.42 ,  25.32
         ,   7.50 ,  92.50 ,
         ,  21.43 ,  25.69 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
No       ,     11 ,    107 ,    118
         ,   6.96 ,  67.72 ,  74.68
         ,   9.32 ,  90.68 ,
         ,  78.57 ,  74.31 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Total          14      144      158
             8.86    91.14   100.00
      Statistics for Table of new1 by Q07_2_07
Statistic                      DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                      1      0.1228    0.7260
Likelihood Ratio Chi-Square     1      0.1269    0.7216
Continuity Adj. Chi-Square      1      0.0008    0.9772
Mantel-Haenszel Chi-Square      1      0.1220    0.7268
Phi Coefficient                       -0.0279
Contingency Coefficient                0.0279
Cramer's V                            -0.0279
 WARNING: 25% of the cells have expected counts less
          than 5. Chi-Square may not be a valid test.
                 Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)        3
          Left-sided Pr <= F         0.5068
          Right-sided Pr >= F        0.7400
          Table Probability (P)      0.2468
          Two-sided Pr <= P          1.0000
                  Sample Size = 158

     Table of new1 by Q07_2_08
Frequency,
Percent  ,
Row Pct  ,
Col Pct  ,Yes     ,No      ,  Total
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Yes      ,      3 ,     37 ,     40
         ,   1.90 ,  23.42 ,  25.32
         ,   7.50 ,  92.50 ,
         ,  42.86 ,  24.50 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
No       ,      4 ,    114 ,    118
         ,   2.53 ,  72.15 ,  74.68
         ,   3.39 ,  96.61 ,
         ,  57.14 ,  75.50 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Total           7      151      158
             4.43    95.57   100.00
      Statistics for Table of new1 by Q07_2_08
Statistic                      DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                      1      1.1919    0.2749
Likelihood Ratio Chi-Square     1      1.0701    0.3009
Continuity Adj. Chi-Square      1      0.4188    0.5175
Mantel-Haenszel Chi-Square      1      1.1844    0.2765
Phi Coefficient                        0.0869
Contingency Coefficient                0.0865
Cramer's V                             0.0869
 WARNING: 25% of the cells have expected counts less
          than 5. Chi-Square may not be a valid test.
                 Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)        3
          Left-sided Pr <= F         0.9310
          Right-sided Pr >= F        0.2469
          Table Probability (P)      0.1779
          Two-sided Pr <= P          0.3706
                  Sample Size = 158
                 Table of new1 by Q08
Frequency,
Percent  ,
Row Pct  ,
Col Pct  ,Yes     ,No      ,  Total
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Yes      ,     39 ,      1 ,     40
         ,  24.68 ,   0.63 ,  25.32
         ,  97.50 ,   2.50 ,
         ,  28.89 ,   4.35 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
No       ,     96 ,     22 ,    118
         ,  60.76 ,  13.92 ,  74.68
         ,  81.36 ,  18.64 ,
         ,  71.11 ,  95.65 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Total         135       23      158
            85.44    14.56   100.00

        Statistics for Table of new1 by Q08
Statistic                      DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
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Chi-Square                      1      6.2598    0.0124
Likelihood Ratio Chi-Square     1      8.2497    0.0041
Continuity Adj. Chi-Square      1      5.0292    0.0249
Mantel-Haenszel Chi-Square      1      6.2202    0.0126
Phi Coefficient                        0.1990
Contingency Coefficient                0.1952
Cramer's V                             0.1990
                 Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)        39
          Left-sided Pr <= F          0.9993
          Right-sided Pr >= F         0.0070
          Table Probability (P)       0.0063
          Two-sided Pr <= P           0.0095
                  Sample Size = 158

                 Table of new1 by Q10
         Frequency,
         Percent  ,
         Row Pct  ,
         Col Pct  ,Yes     ,No      ,  Total
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Yes      ,     39 ,      1 ,     40
                  ,  24.68 ,   0.63 ,  25.32
                  ,  97.50 ,   2.50 ,
                  ,  28.26 ,   5.00 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         No       ,     99 ,     19 ,    118
                  ,  62.66 ,  12.03 ,  74.68
                  ,  83.90 ,  16.10 ,
                  ,  71.74 ,  95.00 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Total         138       20      158
                     87.34    12.66   100.00

         Statistics for Table of new1 by Q10
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                      1      4.9989    0.0254
Likelihood Ratio Chi-Square     1      6.5170    0.0107
Continuity Adj. Chi-Square      1      3.8443    0.0499
Mantel-Haenszel Chi-Square      1      4.9673    0.0258
Phi Coefficient                        0.1779
Contingency Coefficient                0.1751
Cramer's V                             0.1779
                 Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)        39
          Left-sided Pr <= F          0.9981
          Right-sided Pr >= F         0.0168
          Table Probability (P)       0.0150
          Two-sided Pr <= P           0.0267
                  Sample Size = 158
```

```
        Table of new1 by Q14
Frequency,
Percent  ,
Row Pct  ,
Col Pct  ,Yes     ,No      ,  Total
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Yes      ,     24 ,     16 ,     40
         ,  15.19 ,  10.13 ,  25.32
         ,  60.00 ,  40.00 ,
         ,  24.74 ,  26.23 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
No       ,     73 ,     45 ,    118
         ,  46.20 ,  28.48 ,  74.68
         ,  61.86 ,  38.14 ,
         ,  75.26 ,  73.77 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Total          97       61      158
            61.39    38.61   100.00

Statistics for Table of new1 by Q14
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                     1      0.0438    0.8342
Likelihood Ratio Chi-Square    1      0.0437    0.8344
Continuity Adj. Chi-Square     1      0.0005    0.9829
Mantel-Haenszel Chi-Square     1      0.0435    0.8347
Phi Coefficient                      -0.0167
Contingency Coefficient               0.0166
Cramer's V                           -0.0167
        Fisher's Exact Test
 ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
 Cell (1,1) Frequency (F)        24
 Left-sided Pr <= F          0.4886
 Right-sided Pr >= F         0.6564
 Table Probability (P)       0.1451
 Two-sided Pr <= P           0.8527
         Sample Size = 158

      Table of new1 by Q15_01
Frequency,
Percent  ,
Row Pct  ,
Col Pct  ,Yes     ,No      ,  Total
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Yes      ,     35 ,      5 ,     40
         ,  22.15 ,   3.16 ,  25.32
         ,  87.50 ,  12.50 ,
         ,  26.92 ,  17.86 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
No       ,     95 ,     23 ,    118
         ,  60.13 ,  14.56 ,  74.68
         ,  80.51 ,  19.49 ,
         ,  73.08 ,  82.14 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Total         130       28      158
            82.28    17.72   100.00

Statistics for Table of new1 by Q15_01
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                     1      1.0015    0.3170
Likelihood Ratio Chi-Square    1      1.0638    0.3024
Continuity Adj. Chi-Square     1      0.5794    0.4466
Mantel-Haenszel Chi-Square     1      0.9951    0.3185
Phi Coefficient                       0.0796
Contingency Coefficient               0.0794
Cramer's V                            0.0796
        Fisher's Exact Test
 ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
 Cell (1,1) Frequency (F)        35
 Left-sided Pr <= F          0.8958
 Right-sided Pr >= F         0.2270
 Table Probability (P)       0.1228
 Two-sided Pr <= P           0.4722
         Sample Size = 158
```

```
      Table of new1 by Q15_02
Frequency,
Percent  ,
Row Pct  ,
Col Pct  ,Yes     ,No      ,  Total
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Yes      ,     31 ,      9 ,     40
         ,  19.62 ,   5.70 ,  25.32
         ,  77.50 ,  22.50 ,
         ,  25.20 ,  25.71 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
No       ,     92 ,     26 ,    118
         ,  58.23 ,  16.46 ,  74.68
         ,  77.97 ,  22.03 ,
         ,  74.80 ,  74.29 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Total         123       35      158
            77.85    22.15   100.00

        Statistics for Table of new1 by Q15_02
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                     1      0.0038    0.9511
Likelihood Ratio Chi-Square    1      0.0038    0.9511
Continuity Adj. Chi-Square     1      0.0000    1.0000
Mantel-Haenszel Chi-Square     1      0.0037    0.9512
Phi Coefficient                      -0.0049
Contingency Coefficient               0.0049
Cramer's V                           -0.0049
                 Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)        31
          Left-sided Pr <= F          0.5550
          Right-sided Pr >= F         0.6179
          Table Probability (P)       0.1729
          Two-sided Pr <= P           1.0000
                  Sample Size = 158

      Table of new1 by Q15_03
Frequency,
Percent  ,
Row Pct  ,
Col Pct  ,Yes     ,No      ,  Total
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Yes      ,     37 ,      3 ,     40
         ,  23.42 ,   1.90 ,  25.32
         ,  92.50 ,   7.50 ,
         ,  26.62 ,  15.79 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
No       ,    102 ,     16 ,    118
         ,  64.56 ,  10.13 ,  74.68
         ,  86.44 ,  13.56 ,
         ,  73.38 ,  84.21 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Total         139       19      158
            87.97    12.03   100.00

        Statistics for Table of new1 by Q15_03
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                     1      1.0368    0.3086
Likelihood Ratio Chi-Square    1      1.1326    0.2872
Continuity Adj. Chi-Square     1      0.5431    0.4611
Mantel-Haenszel Chi-Square     1      1.0302    0.3101
Phi Coefficient                       0.0810
Contingency Coefficient               0.0807
Cramer's V                            0.0810
 WARNING: 25% of the cells have expected counts less
          than 5. Chi-Square may not be a valid test.
                 Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)        37
          Left-sided Pr <= F          0.9088
          Right-sided Pr >= F         0.2364
          Table Probability (P)       0.1452
          Two-sided Pr <= P           0.4061
                  Sample Size = 158
      Table of new1 by Q15_04
Frequency,
Percent  ,
Row Pct  ,
Col Pct  ,Yes     ,No      ,  Total
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Yes      ,     25 ,     15 ,     40
         ,  15.82 ,   9.49 ,  25.32
         ,  62.50 ,  37.50 ,
         ,  26.88 ,  23.08 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
No       ,     68 ,     50 ,    118
         ,  43.04 ,  31.65 ,  74.68
         ,  57.63 ,  42.37 ,
         ,  73.12 ,  76.92 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Total          93       65      158
            58.86    41.14   100.00

        Statistics for Table of new1 by Q15_04
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
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Chi-Square                      1      0.2929    0.5883
Likelihood Ratio Chi-Square     1      0.2949    0.5871
Continuity Adj. Chi-Square      1      0.1263    0.7223
Mantel-Haenszel Chi-Square      1      0.2911    0.5895
Phi Coefficient                        0.0431
Contingency Coefficient                0.0430
Cramer's V                             0.0431
                 Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)        25
          Left-sided Pr <= F          0.7655
          Right-sided Pr >= F         0.3631
          Table Probability (P)       0.1286
          Two-sided Pr <= P           0.7105
                  Sample Size = 158

               Table of new1 by Q15_05
         Frequency,
         Percent  ,
         Row Pct  ,
         Col Pct  ,Yes     ,No      ,  Total
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Yes      ,     27 ,     13 ,     40
                  ,  17.09 ,   8.23 ,  25.32
                  ,  67.50 ,  32.50 ,
                  ,  24.11 ,  28.26 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         No       ,     85 ,     33 ,    118
                  ,  53.80 ,  20.89 ,  74.68
                  ,  72.03 ,  27.97 ,
                  ,  75.89 ,  71.74 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Total         112       46      158
                     70.89    29.11   100.00

        Statistics for Table of new1 by Q15_05
Statistic                      DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                      1      0.2976    0.5854
Likelihood Ratio Chi-Square     1      0.2934    0.5880
Continuity Adj. Chi-Square      1      0.1184    0.7308
Mantel-Haenszel Chi-Square      1      0.2957    0.5866
Phi Coefficient                       -0.0434
Contingency Coefficient                0.0434
Cramer's V                            -0.0434
                 Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)        27
          Left-sided Pr <= F          0.3609
          Right-sided Pr >= F         0.7742
          Table Probability (P)       0.1351
          Two-sided Pr <= P           0.6875
                  Sample Size = 158
```

```
      Table of new1 by Q15_06
Frequency,
Percent  ,
Row Pct  ,
Col Pct  ,Yes     ,No      ,  Total
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Yes      ,     22 ,     18 ,     40
         ,  13.92 ,  11.39 ,  25.32
         ,  55.00 ,  45.00 ,
         ,  26.19 ,  24.32 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
No       ,     62 ,     56 ,    118
         ,  39.24 ,  35.44 ,  74.68
         ,  52.54 ,  47.46 ,
         ,  73.81 ,  75.68 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Total          84       74      158
            53.16    46.84   100.00

        Statistics for Table of new1 by Q15_06
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                     1      0.0725    0.7878
Likelihood Ratio Chi-Square    1      0.0726    0.7877
Continuity Adj. Chi-Square     1      0.0074    0.9316
Mantel-Haenszel Chi-Square     1      0.0720    0.7884
Phi Coefficient                       0.0214
Contingency Coefficient               0.0214
Cramer's V                            0.0214
                     Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)        22
          Left-sided Pr <= F          0.6738
          Right-sided Pr >= F         0.4666
          Table Probability (P)       0.1404
          Two-sided Pr <= P           0.8555
                  Sample Size = 158

      Table of new1 by Q15_07
Frequency,
Percent  ,
Row Pct  ,
Col Pct  ,Yes     ,No      ,  Total
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Yes      ,     26 ,     14 ,     40
         ,  16.46 ,   8.86 ,  25.32
         ,  65.00 ,  35.00 ,
         ,  23.85 ,  28.57 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
No       ,     83 ,     35 ,    118
         ,  52.53 ,  22.15 ,  74.68
         ,  70.34 ,  29.66 ,
         ,  76.15 ,  71.43 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Total         109       49      158
            68.99    31.01   100.00

        Statistics for Table of new1 by Q15_07
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                     1      0.3980    0.5281
Likelihood Ratio Chi-Square    1      0.3924    0.5310
Continuity Adj. Chi-Square     1      0.1876    0.6649
Mantel-Haenszel Chi-Square     1      0.3955    0.5294
Phi Coefficient                      -0.0502
Contingency Coefficient               0.0501
Cramer's V                           -0.0502
                     Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)        26
          Left-sided Pr <= F          0.3290
          Right-sided Pr >= F         0.7974
          Table Probability (P)       0.1264
          Two-sided Pr <= P           0.5564
                  Sample Size = 158
```

```
      Table of new1 by Q15_08
Frequency,
Percent  ,
Row Pct  ,
Col Pct  ,Yes     ,No      ,  Total
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Yes      ,     28 ,     12 ,     40
         ,  17.72 ,   7.59 ,  25.32
         ,  70.00 ,  30.00 ,
         ,  27.18 ,  21.82 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
No       ,     75 ,     43 ,    118
         ,  47.47 ,  27.22 ,  74.68
         ,  63.56 ,  36.44 ,
         ,  72.82 ,  78.18 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Total         103       55      158
            65.19    34.81   100.00

       Statistics for Table of new1 by Q15_08
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                     1      0.5461    0.4599
Likelihood Ratio Chi-Square    1      0.5549    0.4563
Continuity Adj. Chi-Square     1      0.2991    0.5844
Mantel-Haenszel Chi-Square     1      0.5426    0.4613
Phi Coefficient                       0.0588
Contingency Coefficient               0.0587
Cramer's V                            0.0588
                Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)        28
          Left-sided Pr <= F          0.8237
          Right-sided Pr >= F         0.2948
          Table Probability (P)       0.1185
          Two-sided Pr <= P           0.5654
                  Sample Size = 158


      Table of new1 by Q15_09
Frequency,
Percent  ,
Row Pct  ,
Col Pct  ,Yes     ,No      ,  Total
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Yes      ,     23 ,     17 ,     40
         ,  14.56 ,  10.76 ,  25.32
         ,  57.50 ,  42.50 ,
         ,  29.11 ,  21.52 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
No       ,     56 ,     62 ,    118
         ,  35.44 ,  39.24 ,  74.68
         ,  47.46 ,  52.54 ,
         ,  70.89 ,  78.48 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Total          79       79      158
            50.00    50.00   100.00

       Statistics for Table of new1 by Q15_09
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                     1      1.2051    0.2723
Likelihood Ratio Chi-Square    1      1.2086    0.2716
Continuity Adj. Chi-Square     1      0.8369    0.3603
Mantel-Haenszel Chi-Square     1      1.1975    0.2738
Phi Coefficient                       0.0873
Contingency Coefficient               0.0870
Cramer's V                            0.0873
                Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)        23
          Left-sided Pr <= F          0.9000
          Right-sided Pr >= F         0.1802
          Table Probability (P)       0.0802
          Two-sided Pr <= P           0.3604
                  Sample Size = 158

      Table of new1 by Q15_10
Frequency,
Percent  ,
Row Pct  ,
Col Pct  ,Yes     ,No      ,  Total
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Yes      ,     28 ,     12 ,     40
         ,  17.72 ,   7.59 ,  25.32
         ,  70.00 ,  30.00 ,
         ,  26.67 ,  22.64 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
No       ,     77 ,     41 ,    118
         ,  48.73 ,  25.95 ,  74.68
         ,  65.25 ,  34.75 ,
         ,  73.33 ,  77.36 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Total         105       53      158
            66.46    33.54   100.00

       Statistics for Table of new1 by Q15_10
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
```

```
Chi-Square                     1      0.3018    0.5827
Likelihood Ratio Chi-Square    1      0.3056    0.5804
Continuity Adj. Chi-Square     1      0.1265    0.7221
Mantel-Haenszel Chi-Square     1      0.2999    0.5839
Phi Coefficient                       0.0437
Contingency Coefficient               0.0437
Cramer's V                            0.0437
                 Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)        28
          Left-sided Pr <= F          0.7697
          Right-sided Pr >= F         0.3648
          Table Probability (P)       0.1344
          Two-sided Pr <= P           0.6992
                  Sample Size = 158

               Table of new1 by q15_11n
         Frequency,
         Percent  ,
         Row Pct  ,
         Col Pct  ,       1,       2,  Total
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Yes      ,     38 ,      2 ,     40
                  ,  24.05 ,   1.27 ,  25.32
                  ,  95.00 ,   5.00 ,
                  ,  25.00 ,  33.33 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         No       ,    114 ,      4 ,    118
                  ,  72.15 ,   2.53 ,  74.68
                  ,  96.61 ,   3.39 ,
                  ,  75.00 ,  66.67 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Total         152        6      158
                     96.20     3.80   100.00

       Statistics for Table of new1 by q15_11n
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                     1      0.2120    0.6452
Likelihood Ratio Chi-Square    1      0.2000    0.6547
Continuity Adj. Chi-Square     1      0.0000    1.0000
Mantel-Haenszel Chi-Square     1      0.2107    0.6462
Phi Coefficient                      -0.0366
Contingency Coefficient               0.0366
Cramer's V                           -0.0366
 WARNING: 50% of the cells have expected counts less
          than 5. Chi-Square may not be a valid test.
                 Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)        38
          Left-sided Pr <= F          0.4756
          Right-sided Pr >= F         0.8294
          Table Probability (P)       0.3049
          Two-sided Pr <= P           0.6435
                  Sample Size = 158
               Table of new1 by Q17_01
         Frequency,
         Percent  ,
         Row Pct  ,
         Col Pct  ,Yes     ,No      ,  Total
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Yes      ,     36 ,      4 ,     40
                  ,  22.78 ,   2.53 ,  25.32
                  ,  90.00 ,  10.00 ,
                  ,  31.03 ,   9.52 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         No       ,     80 ,     38 ,    118
                  ,  50.63 ,  24.05 ,  74.68
                  ,  67.80 ,  32.20 ,
                  ,  68.97 ,  90.48 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Total         116       42      158
                     73.42    26.58   100.00

        Statistics for Table of new1 by Q17_01
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                     1      7.5462    0.0060
Likelihood Ratio Chi-Square    1      8.6755    0.0032
Continuity Adj. Chi-Square     1      6.4514    0.0111
Mantel-Haenszel Chi-Square     1      7.4985    0.0062
Phi Coefficient                       0.2185
Contingency Coefficient               0.2135
Cramer's V                            0.2185
                 Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)        36
          Left-sided Pr <= F          0.9992
          Right-sided Pr >= F         0.0037
          Table Probability (P)       0.0029
          Two-sided Pr <= P           0.0065
                  Sample Size = 158

               Table of new1 by Q17_02
         Frequency,
         Percent  ,
         Row Pct  ,
         Col Pct  ,Yes     ,No      ,  Total
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
```

Yes	25	15	40
	15.82	9.49	25.32
	62.50	37.50	
	28.74	21.13	
No	62	56	118
	39.24	35.44	74.68
	52.54	47.46	
	71.26	78.87	
Total	87	71	158
	55.06	44.94	100.00

Statistics for Table of new1 by Q17_02

Statistic	DF	Value	Prob
Chi-Square	1	1.1971	0.2739
Likelihood Ratio Chi-Square	1	1.2089	0.2716
Continuity Adj. Chi-Square	1	0.8285	0.3627
Mantel-Haenszel Chi-Square	1	1.1895	0.2754
Phi Coefficient		0.0870	
Contingency Coefficient		0.0867	
Cramer's V		0.0870	

Fisher's Exact Test

Cell (1,1) Frequency (F)	25
Left-sided Pr <= F	0.8999
Right-sided Pr >= F	0.1816
Table Probability (P)	0.0815
Two-sided Pr <= P	0.3580

Sample Size = 158

Table of new1 by Q17_03

Frequency / Percent / Row Pct / Col Pct	Yes	No	Total
Yes	20	20	40
	12.66	12.66	25.32
	50.00	50.00	
	51.28	16.81	
No	19	99	118
	12.03	62.66	74.68
	16.10	83.90	
	48.72	83.19	
Total	39	119	158
	24.68	75.32	100.00

Statistics for Table of new1 by Q17_03

Statistic	DF	Value	Prob
Chi-Square	1	18.4648	<.0001
Likelihood Ratio Chi-Square	1	16.9799	<.0001
Continuity Adj. Chi-Square	1	16.6864	<.0001
Mantel-Haenszel Chi-Square	1	18.3479	<.0001
Phi Coefficient		0.3419	
Contingency Coefficient		0.3235	
Cramer's V		0.3419	

Fisher's Exact Test

Cell (1,1) Frequency (F)	20
Left-sided Pr <= F	1.0000
Right-sided Pr >= F	4.233E-05
Table Probability (P)	3.490E-05
Two-sided Pr <= P	7.462E-05

Sample Size = 158

Table of new1 by Q17_04

Frequency / Percent / Row Pct / Col Pct	Yes	No	Total
Yes	28	12	40
	17.72	7.59	25.32
	70.00	30.00	
	31.46	17.39	
No	61	57	118
	38.61	36.08	74.68
	51.69	48.31	
	68.54	82.61	
Total	89	69	158
	56.33	43.67	100.00

Statistics for Table of new1 by Q17_04

Statistic	DF	Value	Prob
Chi-Square	1	4.0691	0.0437
Likelihood Ratio Chi-Square	1	4.1798	0.0409
Continuity Adj. Chi-Square	1	3.3590	0.0668
Mantel-Haenszel Chi-Square	1	4.0434	0.0443
Phi Coefficient		0.1605	
Contingency Coefficient		0.1585	
Cramer's V		0.1605	

Fisher's Exact Test

Cell (1,1) Frequency (F)	28
Left-sided Pr <= F	0.9871
Right-sided Pr >= F	0.0323
Table Probability (P)	0.0194
Two-sided Pr <= P	0.0643

Sample Size = 158

```
           Table of new1 by Q17_05
     Frequency,
     Percent  ,
     Row Pct  ,
     Col Pct  ,Yes     ,No      ,  Total
     ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
     Yes      ,     16 ,     24 ,     40
              ,  10.13 ,  15.19 ,  25.32
              ,  40.00 ,  60.00 ,
              ,  28.57 ,  23.53 ,
     ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
     No       ,     40 ,     78 ,    118
              ,  25.32 ,  49.37 ,  74.68
              ,  33.90 ,  66.10 ,
              ,  71.43 ,  76.47 ,
     ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
     Total          56      102      158
                 35.44    64.56   100.00

        Statistics for Table of new1 by Q17_05
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                     1      0.4861    0.4857
Likelihood Ratio Chi-Square    1      0.4806    0.4881
Continuity Adj. Chi-Square     1      0.2560    0.6129
Mantel-Haenszel Chi-Square     1      0.4830    0.4871
Phi Coefficient                       0.0555
Contingency Coefficient               0.0554
Cramer's V                            0.0555
                 Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)        16
          Left-sided Pr <= F          0.8133
          Right-sided Pr >= F         0.3042
          Table Probability (P)       0.1175
          Two-sided Pr <= P           0.5668
                  Sample Size = 158

           Table of new1 by q17_06n
     Frequency,
     Percent  ,
     Row Pct  ,
     Col Pct  ,Yes     ,No      ,  Total
     ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
     Yes      ,     38 ,      2 ,     40
              ,  24.05 ,   1.27 ,  25.32
              ,  95.00 ,   5.00 ,
              ,  27.54 ,  10.00 ,
     ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
     No       ,    100 ,     18 ,    118
              ,  63.29 ,  11.39 ,  74.68
              ,  84.75 ,  15.25 ,
              ,  72.46 ,  90.00 ,
     ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
     Total         138       20      158
                 87.34    12.66   100.00

       Statistics for Table of new1 by q17_06n
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                     1      2.8412    0.0919
Likelihood Ratio Chi-Square    1      3.3534    0.0671
Continuity Adj. Chi-Square     1      1.9894    0.1584
Mantel-Haenszel Chi-Square     1      2.8232    0.0929
Phi Coefficient                       0.1341
Contingency Coefficient               0.1329
Cramer's V                            0.1341
                 Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)        38
          Left-sided Pr <= F          0.9832
          Right-sided Pr >= F         0.0724
          Table Probability (P)       0.0555
          Two-sided Pr <= P           0.1060
                  Sample Size = 158

                                           Cumulative    Cumulative
new1    Q17_07    Frequency     Percent     Frequency      Percent
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Yes     No              40       25.32            40        25.32
No      No             118       74.68           158       100.00

           Table of new1 by Q18_01
     Frequency,
     Percent  ,
     Row Pct  ,
     Col Pct  ,Yes     ,No      ,  Total
     ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
     Yes      ,     20 ,     20 ,     40
              ,  12.66 ,  12.66 ,  25.32
              ,  50.00 ,  50.00 ,
              ,  21.74 ,  30.30 ,
     ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
     No       ,     72 ,     46 ,    118
              ,  45.57 ,  29.11 ,  74.68
              ,  61.02 ,  38.98 ,
              ,  78.26 ,  69.70 ,
     ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
     Total          92       66      158
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                    58.23    41.77   100.00
        Statistics for Table of new1 by Q18_01
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                     1      1.4907    0.2221
Likelihood Ratio Chi-Square    1      1.4781    0.2241
Continuity Adj. Chi-Square     1      1.0722    0.3005
Mantel-Haenszel Chi-Square     1      1.4813    0.2236
Phi Coefficient                      -0.0971
Contingency Coefficient               0.0967
Cramer's V                           -0.0971
                 Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)        20
          Left-sided Pr <= F          0.1503
          Right-sided Pr >= F         0.9197
          Table Probability (P)       0.0700
          Two-sided Pr <= P           0.2667
                  Sample Size = 158

               Table of new1 by Q18_02
         Frequency,
         Percent  ,
         Row Pct  ,
         Col Pct  ,Yes     ,No      ,  Total
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Yes      ,     37 ,      3 ,     40
                  ,  23.42 ,   1.90 ,  25.32
                  ,  92.50 ,   7.50 ,
                  ,  30.83 ,   7.89 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         No       ,     83 ,     35 ,    118
                  ,  52.53 ,  22.15 ,  74.68
                  ,  70.34 ,  29.66 ,
                  ,  69.17 ,  92.11 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Total         120       38      158
                    75.95    24.05   100.00
        Statistics for Table of new1 by Q18_02
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                     1      8.0318    0.0046
Likelihood Ratio Chi-Square    1      9.5350    0.0020
Continuity Adj. Chi-Square     1      6.8644    0.0088
Mantel-Haenszel Chi-Square     1      7.9810    0.0047
Phi Coefficient                       0.2255
Contingency Coefficient               0.2199
Cramer's V                            0.2255
                 Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)        37
          Left-sided Pr <= F          0.9996
          Right-sided Pr >= F         0.0026
          Table Probability (P)       0.0021
          Two-sided Pr <= P           0.0047

                  Sample Size = 158

               Table of new1 by Q18_03
         Frequency,
         Percent  ,
         Row Pct  ,
         Col Pct  ,Yes     ,No      ,  Total
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Yes      ,      2 ,     38 ,     40
                  ,   1.27 ,  24.05 ,  25.32
                  ,   5.00 ,  95.00 ,
                  ,   6.25 ,  30.16 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         No       ,     30 ,     88 ,    118
                  ,  18.99 ,  55.70 ,  74.68
                  ,  25.42 ,  74.58 ,
                  ,  93.75 ,  69.84 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Total          32      126      158
                    20.25    79.75   100.00
        Statistics for Table of new1 by Q18_03
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                     1      7.7152    0.0055
Likelihood Ratio Chi-Square    1      9.5502    0.0020
Continuity Adj. Chi-Square     1      6.5025    0.0108
Mantel-Haenszel Chi-Square     1      7.6664    0.0056
Phi Coefficient                      -0.2210
Contingency Coefficient               0.2158
Cramer's V                           -0.2210
                 Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)         2
          Left-sided Pr <= F          0.0029
          Right-sided Pr >= F         0.9996
          Table Probability (P)       0.0025
          Two-sided Pr <= P           0.0054
                  Sample Size = 158

               Table of new1 by Q18_04
         Frequency,
         Percent  ,
         Row Pct  ,
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        Col Pct  ,Yes     ,No      ,  Total
        ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
        Yes      ,      2 ,     38 ,     40
                 ,   1.27 ,  24.05 ,  25.32
                 ,   5.00 ,  95.00 ,
                 ,  66.67 ,  24.52 ,
        ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
        No       ,      1 ,    117 ,    118
                 ,   0.63 ,  74.05 ,  74.68
                 ,   0.85 ,  99.15 ,
                 ,  33.33 ,  75.48 ,
        ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
        Total           3      155      158
                     1.90    98.10   100.00
       Statistics for Table of new1 by Q18_04
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                     1      2.7655    0.0963
Likelihood Ratio Chi-Square    1      2.3125    0.1283
Continuity Adj. Chi-Square     1      0.9854    0.3209
Mantel-Haenszel Chi-Square     1      2.7480    0.0974
Phi Coefficient                       0.1323
Contingency Coefficient               0.1312
Cramer's V                            0.1323
 WARNING: 50% of the cells have expected counts less
          than 5. Chi-Square may not be a valid test.
                 Fisher's Exact Test
         ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
         Cell (1,1) Frequency (F)         2
         Left-sided Pr <= F          0.9847
         Right-sided Pr >= F         0.1580
         Table Probability (P)       0.1427
         Two-sided Pr <= P           0.1580
                 Sample Size = 158

              Table of new1 by q20_1n
        Frequency,
        Percent  ,
        Row Pct  ,
        Col Pct  ,Yes     ,No      ,  Total
        ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
        Yes      ,     21 ,     19 ,     40
                 ,  13.29 ,  12.03 ,  25.32
                 ,  52.50 ,  47.50 ,
                 ,  19.27 ,  38.78 ,
        ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
        No       ,     88 ,     30 ,    118
                 ,  55.70 ,  18.99 ,  74.68
                 ,  74.58 ,  25.42 ,
                 ,  80.73 ,  61.22 ,
        ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
        Total         109       49      158
                    68.99    31.01   100.00

       Statistics for Table of new1 by q20_1n
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                     1      6.8050    0.0091
Likelihood Ratio Chi-Square    1      6.5176    0.0107
Continuity Adj. Chi-Square     1      5.8123    0.0159
Mantel-Haenszel Chi-Square     1      6.7619    0.0093
Phi Coefficient                      -0.2075
Contingency Coefficient               0.2032
Cramer's V                           -0.2075
                 Fisher's Exact Test
         ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
         Cell (1,1) Frequency (F)        21
         Left-sided Pr <= F          0.0089
         Right-sided Pr >= F         0.9970
         Table Probability (P)       0.0059
         Two-sided Pr <= P           0.0167
                 Sample Size = 158

               Table of new1 by Q20_2
        Frequency,
        Percent  ,
        Row Pct  ,
        Col Pct  ,Yes     ,No      ,  Total
        ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
        Yes      ,      7 ,     33 ,     40
                 ,   4.43 ,  20.89 ,  25.32
                 ,  17.50 ,  82.50 ,
                 ,  19.44 ,  27.05 ,
        ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
        No       ,     29 ,     89 ,    118
                 ,  18.35 ,  56.33 ,  74.68
                 ,  24.58 ,  75.42 ,
                 ,  80.56 ,  72.95 ,
        ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
        Total          36      122      158
                    22.78    77.22   100.00

       Statistics for Table of new1 by Q20_2
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                     1      0.8502    0.3565
Likelihood Ratio Chi-Square    1      0.8863    0.3465
Continuity Adj. Chi-Square     1      0.4956    0.4814
Mantel-Haenszel Chi-Square     1      0.8449    0.3580
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Phi Coefficient                      -0.0734
Contingency Coefficient               0.0732
Cramer's V                           -0.0734
                 Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)         7
          Left-sided Pr <= F          0.2442
          Right-sided Pr >= F         0.8744
          Table Probability (P)       0.1186
          Two-sided Pr <= P           0.3934
                  Sample Size = 158
                Table of new1 by Q20_3
         Frequency,
         Percent  ,
         Row Pct  ,
         Col Pct  ,Yes     ,No      ,  Total
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Yes      ,      9 ,     31 ,     40
                  ,   5.70 ,  19.62 ,  25.32
                  ,  22.50 ,  77.50 ,
                  ,  17.65 ,  28.97 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         No       ,     42 ,     76 ,    118
                  ,  26.58 ,  48.10 ,  74.68
                  ,  35.59 ,  64.41 ,
                  ,  82.35 ,  71.03 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Total          51      107      158
                     32.28    67.72   100.00

        Statistics for Table of new1 by Q20_3
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                     1      2.3428    0.1259
Likelihood Ratio Chi-Square    1      2.4495    0.1176
Continuity Adj. Chi-Square     1      1.7821    0.1819
Mantel-Haenszel Chi-Square     1      2.3280    0.1271
Phi Coefficient                      -0.1218
Contingency Coefficient               0.1209
Cramer's V                           -0.1218
                 Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)         9
          Left-sided Pr <= F          0.0891
          Right-sided Pr >= F         0.9605
          Table Probability (P)       0.0496
          Two-sided Pr <= P           0.1705
                  Sample Size = 158

                Table of new1 by Q20_4
         Frequency,
         Percent  ,
         Row Pct  ,
         Col Pct  ,Yes     ,No      ,  Total
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Yes      ,      7 ,     33 ,     40
                  ,   4.43 ,  20.89 ,  25.32
                  ,  17.50 ,  82.50 ,
                  ,  15.56 ,  29.20 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         No       ,     38 ,     80 ,    118
                  ,  24.05 ,  50.63 ,  74.68
                  ,  32.20 ,  67.80 ,
                  ,  84.44 ,  70.80 ,
         ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
         Total          45      113      158
                     28.48    71.52   100.00

        Statistics for Table of new1 by Q20_4
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                     1      3.1706    0.0750
Likelihood Ratio Chi-Square    1      3.3919    0.0655
Continuity Adj. Chi-Square     1      2.4899    0.1146
Mantel-Haenszel Chi-Square     1      3.1505    0.0759
Phi Coefficient                      -0.1417
Contingency Coefficient               0.1403
Cramer's V                           -0.1417
                 Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)         7
          Left-sided Pr <= F          0.0542
          Right-sided Pr >= F         0.9794
          Table Probability (P)       0.0336
          Two-sided Pr <= P           0.1041
                  Sample Size = 158
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       Table of new1 by Q20_5
Frequency,
Percent  ,
Row Pct  ,
Col Pct  ,Yes     ,No      ,  Total
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Yes      ,      7 ,     33 ,     40
         ,   4.43 ,  20.89 ,  25.32
         ,  17.50 ,  82.50 ,
         ,  14.89 ,  29.73 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
No       ,     40 ,     78 ,    118
         ,  25.32 ,  49.37 ,  74.68
         ,  33.90 ,  66.10 ,
         ,  85.11 ,  70.27 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Total          47      111      158
            29.75    70.25   100.00

        Statistics for Table of new1 by Q20_5
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                     1      3.8439    0.0499
Likelihood Ratio Chi-Square    1      4.1277    0.0422
Continuity Adj. Chi-Square     1      3.0993    0.0783
Mantel-Haenszel Chi-Square     1      3.8196    0.0507
Phi Coefficient                      -0.1560
Contingency Coefficient               0.1541
Cramer's V                           -0.1560
                 Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)        7
          Left-sided Pr <= F         0.0361
          Right-sided Pr >= F        0.9872
          Table Probability (P)      0.0233
          Two-sided Pr <= P          0.0706
                Sample Size = 158

       Table of new1 by Q20_6
Frequency,
Percent  ,
Row Pct  ,
Col Pct  ,Yes     ,No      ,  Total
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Yes      ,      6 ,     34 ,     40
         ,   3.80 ,  21.52 ,  25.32
         ,  15.00 ,  85.00 ,
         ,  16.67 ,  27.87 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
No       ,     30 ,     88 ,    118
         ,  18.99 ,  55.70 ,  74.68
         ,  25.42 ,  74.58 ,
         ,  83.33 ,  72.13 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Total          36      122      158
            22.78    77.22   100.00

        Statistics for Table of new1 by Q20_6
Statistic                     DF       Value      Prob
ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
Chi-Square                     1      1.8449    0.1744
Likelihood Ratio Chi-Square    1      1.9704    0.1604
Continuity Adj. Chi-Square     1      1.3000    0.2542
Mantel-Haenszel Chi-Square     1      1.8333    0.1757
Phi Coefficient                      -0.1081
Contingency Coefficient               0.1074
Cramer's V                           -0.1081
                 Fisher's Exact Test
          ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
          Cell (1,1) Frequency (F)        6
          Left-sided Pr <= F         0.1256
          Right-sided Pr >= F        0.9468
          Table Probability (P)      0.0724
          Two-sided Pr <= P          0.1979
                Sample Size = 158
```

```
                 Table of new1 by Q20_7
          Frequency,
          Percent  ,
          Row Pct  ,
          Col Pct  ,Yes     ,No      ,  Total
          ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
          Yes      ,     12 ,     28 ,     40
                   ,   7.59 ,  17.72 ,  25.32
                   ,  30.00 ,  70.00 ,
                   ,  17.14 ,  31.82 ,
          ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
          No       ,     58 ,     60 ,    118
                   ,  36.71 ,  37.97 ,  74.68
                   ,  49.15 ,  50.85 ,
                   ,  82.86 ,  68.18 ,
          ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
          Total          70       88      158
                      44.30    55.70   100.00

         Statistics for Table of new1 by Q20_7
 Statistic                     DF       Value      Prob
 ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
 Chi-Square                     1      4.4409    0.0351
 Likelihood Ratio Chi-Square    1      4.5614    0.0327
 Continuity Adj. Chi-Square     1      3.6986    0.0545
 Mantel-Haenszel Chi-Square     1      4.4128    0.0357
 Phi Coefficient                      -0.1677
 Contingency Coefficient               0.1653
 Cramer's V                           -0.1677
                  Fisher's Exact Test
           ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
           Cell (1,1) Frequency (F)        12
           Left-sided Pr <= F          0.0262
           Right-sided Pr >= F         0.9898
           Table Probability (P)       0.0160
           Two-sided Pr <= P           0.0430
                   Sample Size = 158

                 Table of new1 by Q20_8
          Frequency,
          Percent  ,
          Row Pct  ,
          Col Pct  ,Yes     ,No      ,  Total
          ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
          Yes      ,      5 ,     35 ,     40
                   ,   3.16 ,  22.15 ,  25.32
                   ,  12.50 ,  87.50 ,
                   ,   9.62 ,  33.02 ,
          ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
          No       ,     47 ,     71 ,    118
                   ,  29.75 ,  44.94 ,  74.68
                   ,  39.83 ,  60.17 ,
                   ,  90.38 ,  66.98 ,
          ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
          Total          52      106      158
                      32.91    67.09   100.00

         Statistics for Table of new1 by Q20_8
 Statistic                     DF       Value      Prob
 ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
 Chi-Square                     1     10.1061    0.0015
 Likelihood Ratio Chi-Square    1     11.3928    0.0007
 Continuity Adj. Chi-Square     1      8.9062    0.0028
 Mantel-Haenszel Chi-Square     1     10.0422    0.0015
 Phi Coefficient                      -0.2529
 Contingency Coefficient               0.2452
 Cramer's V                           -0.2529
                  Fisher's Exact Test
           ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
           Cell (1,1) Frequency (F)         5
           Left-sided Pr <= F       8.675E-04
           Right-sided Pr >= F         0.9998
           Table Probability (P)    6.991E-04
           Two-sided Pr <= P           0.0016
                   Sample Size = 158
```

Table of new1 by Q09_1

Frequency / Percent / Row Pct / Col Pct	Most important	Important	Less important	Not so important	Least important	Total
Yes	10	9	4	6	11	40
	6.37	5.73	2.55	3.82	7.01	25.48
	25.00	22.50	10.00	15.00	27.50	
	26.32	33.33	11.43	18.18	45.83	
No	28	18	31	27	13	117
	17.83	11.46	19.75	17.20	8.28	74.52
	23.93	15.38	26.50	23.08	11.11	
	73.68	66.67	88.57	81.82	54.17	
Total	38	27	35	33	24	157
	24.20	17.20	22.29	21.02	15.29	100.00

Statistics for Table of new1 by Q09_1

Statistic	DF	Value	Prob
Chi-Square	4	10.6929	0.0302
Likelihood Ratio Chi-Square	4	10.7548	0.0295
Mantel-Haenszel Chi-Square	1	0.3640	0.5463
Phi Coefficient		0.2610	
Contingency Coefficient		0.2525	
Cramer's V		0.2610	

Effective Sample Size = 157
Frequency Missing = 1

Table of new1 by Q09_2

Frequency / Percent / Row Pct / Col Pct	Most important	Important	Less important	Not so important	Least important	Total
Yes	8	5	13	4	10	40
	5.10	3.18	8.28	2.55	6.37	25.48
	20.00	12.50	32.50	10.00	25.00	
	22.86	16.13	30.23	14.29	50.00	
No	27	26	30	24	10	117
	17.20	16.56	19.11	15.29	6.37	74.52
	23.08	22.22	25.64	20.51	8.55	
	77.14	83.87	69.77	85.71	50.00	
Total	35	31	43	28	20	157
	22.29	19.75	27.39	17.83	12.74	100.00

Statistics for Table of new1 by Q09_2

Statistic	DF	Value	Prob
Chi-Square	4	10.2472	0.0365
Likelihood Ratio Chi-Square	4	9.7871	0.0442
Mantel-Haenszel Chi-Square	1	2.5032	0.1136
Phi Coefficient		0.2555	
Contingency Coefficient		0.2475	
Cramer's V		0.2555	

Effective Sample Size = 157
Frequency Missing = 1

```
                    Table of new1 by Q09_3
Frequency,
Percent  ,
Row Pct  ,
Col Pct  ,Most imp,Importan,Less imp,Not so i,Least im,  Total
         ,ortant  ,t       ,ortant  ,mportant,portant ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Yes      ,     11 ,      6 ,      3 ,      9 ,     11 ,     40
         ,   7.01 ,   3.82 ,   1.91 ,   5.73 ,   7.01 ,  25.48
         ,  27.50 ,  15.00 ,   7.50 ,  22.50 ,  27.50 ,
         ,  29.73 ,  21.43 ,  12.00 ,  30.00 ,  29.73 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
No       ,     26 ,     22 ,     22 ,     21 ,     26 ,    117
         ,  16.56 ,  14.01 ,  14.01 ,  13.38 ,  16.56 ,  74.52
         ,  22.22 ,  18.80 ,  18.80 ,  17.95 ,  22.22 ,
         ,  70.27 ,  78.57 ,  88.00 ,  70.00 ,  70.27 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Total          37       28       25       30       37      157
            23.57    17.83    15.92    19.11    23.57   100.00

            Statistics for Table of new1 by Q09_3
    Statistic                     DF       Value      Prob
    ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
    Chi-Square                     4      3.6614    0.4538
    Likelihood Ratio Chi-Square    4      4.0411    0.4005
    Mantel-Haenszel Chi-Square     1      0.0917    0.7620
    Phi Coefficient                       0.1527
    Contingency Coefficient               0.1510
    Cramer's V                            0.1527
                 Effective Sample Size = 157
                    Frequency Missing = 1

                    Table of new1 by Q09_4
Frequency,
Percent  ,
Row Pct  ,
Col Pct  ,Most imp,Importan,Less imp,Not so i,Least im,  Total
         ,ortant  ,t       ,ortant  ,mportant,portant ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Yes      ,     15 ,      8 ,      6 ,      2 ,      9 ,     40
         ,   9.55 ,   5.10 ,   3.82 ,   1.27 ,   5.73 ,  25.48
         ,  37.50 ,  20.00 ,  15.00 ,   5.00 ,  22.50 ,
         ,  28.85 ,  27.59 ,  18.75 ,  11.76 ,  33.33 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
No       ,     37 ,     21 ,     26 ,     15 ,     18 ,    117
         ,  23.57 ,  13.38 ,  16.56 ,   9.55 ,  11.46 ,  74.52
         ,  31.62 ,  17.95 ,  22.22 ,  12.82 ,  15.38 ,
         ,  71.15 ,  72.41 ,  81.25 ,  88.24 ,  66.67 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Total          52       29       32       17       27      157
            33.12    18.47    20.38    10.83    17.20   100.00

            Statistics for Table of new1 by Q09_4
    Statistic                     DF       Value      Prob
    ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
    Chi-Square                     4      3.7028    0.4477
    Likelihood Ratio Chi-Square    4      3.9882    0.4076
    Mantel-Haenszel Chi-Square     1      0.0753    0.7838
    Phi Coefficient                       0.1536
    Contingency Coefficient               0.1518
    Cramer's V                            0.1536
                 Effective Sample Size = 157
                    Frequency Missing = 1
```

```
                    Table of new1 by Q09_5
Frequency,
Percent  ,
Row Pct  ,
Col Pct  ,Most imp,Importan,Less imp,Not so i,Least im,  Total
         ,ortant  ,t       ,ortant  ,mportant,portant ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Yes      ,      4 ,      7 ,      5 ,     10 ,     14 ,     40
         ,   2.55 ,   4.46 ,   3.18 ,   6.37 ,   8.92 ,  25.48
         ,  10.00 ,  17.50 ,  12.50 ,  25.00 ,  35.00 ,
         ,  14.29 ,  30.43 ,  17.86 ,  30.30 ,  31.11 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
No       ,     24 ,     16 ,     23 ,     23 ,     31 ,    117
         ,  15.29 ,  10.19 ,  14.65 ,  14.65 ,  19.75 ,  74.52
         ,  20.51 ,  13.68 ,  19.66 ,  19.66 ,  26.50 ,
         ,  85.71 ,  69.57 ,  82.14 ,  69.70 ,  68.89 ,
ƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒˆ
Total          28       23       28       33       45      157
            17.83    14.65    17.83    21.02    28.66   100.00

            Statistics for Table of new1 by Q09_5
    Statistic                     DF       Value      Prob
    ƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ
    Chi-Square                     4      4.1582    0.3850
    Likelihood Ratio Chi-Square    4      4.4082    0.3536
    Mantel-Haenszel Chi-Square     1      2.1671    0.1410
    Phi Coefficient                       0.1627
    Contingency Coefficient               0.1606
    Cramer's V                            0.1627
                 Effective Sample Size = 157
                    Frequency Missing = 1
```

APPENDIX H

Log Linear analysis

Model with No 4-Variable Interaction

The CATMOD Procedure

Data Summary

Response	new1*q06_0*q07_1_*q20_1n	Response Levels	15
Weight Variable	wt	Populations	1
Data Set	HULP	Total Frequency	158
Frequency Missing	0	Observations	15

Population Profiles

Sample	Sample Size
1	158

Response Profiles

Response	new1	q06_08n	q07_1_1n	q20_1n
1	Yes	Yes	Yes	Yes
2	Yes	Yes	Yes	No
3	Yes	Yes	No	Yes
4	Yes	Yes	No	No
5	Yes	No	Yes	Yes
6	Yes	No	No	Yes
7	Yes	No	No	No
8	No	Yes	Yes	Yes
9	No	Yes	Yes	No
10	No	Yes	No	Yes
11	No	Yes	No	No
12	No	No	Yes	Yes
13	No	No	Yes	No
14	No	No	No	Yes
15	No	No	No	No

Maximum Likelihood Analysis

Maximum likelihood computations converged.

Maximum Likelihood Analysis of Variance

Source	DF	Chi-Square	Pr > ChiSq
new1	1	16.88	<.0001
q06_08n	1	6.27	0.0123
q20_1n	1	1.44	0.2309
new1*q20_1n	1	10.68	0.0011
q06_08n*q20_1n	1	7.81	0.0052
q07_1_1n	1	5.03	0.0249
q07_1_1n*q20_1n	1	5.51	0.0190
Likelihood Ratio	7	3.95	0.7850

Maximum Likelihood Predicted Values for Response Functions

	------Observed------		------Predicted-----		
Function Number	Function	Standard Error	Function	Standard Error	Residual
1	-588E-19	0.447214	0.311447	0.351013	-0.31145
2	-0.35667	0.492805	-0.23552	0.487299	-0.12115
3	-0.51083	0.516398	-0.52278	0.37464	0.011954
4	-0.51083	0.516398	-0.21668	0.380724	-0.29415
5	-0.91629	0.591608	-0.6568	0.379322	-0.25949
6	-2.30259	1.048809	-1.49103	0.401286	-0.81156
7	-0.51083	0.516398	-0.16341	0.303183	-0.34742
8	1.435085	0.351866	1.744261	0.294881	-0.30918
9	-0.22314	0.474342	-0.07211	0.379843	-0.15103
10	0.741937	0.384212	0.910035	0.322645	-0.1681
11	-0.51083	0.516398	-0.05327	0.296023	-0.45755
12	0.693147	0.387298	0.776011	0.32807	-0.08286
13	-0.51083	0.516398	-0.01884	0.297878	-0.49198
14	-0.69315	0.547723	-0.05822	0.353235	-0.63493

Maximum Likelihood Predicted Values for Frequencies

new1	q06_08n	q07_1_1n	q20_1n	Observed Frequency	Observed Standard Error	Predicted Frequency	Predicted Standard Error	Residual
Yes	Yes	Yes	Yes	10	3.06057	10.61224	2.343297	-0.61224
Yes	Yes	Yes	No	7	2.586479	6.141315	1.842156	0.858685
Yes	Yes	No	Yes	6	2.40253	4.607945	1.182929	1.392055
Yes	Yes	No	No	6	2.40253	6.258131	1.652793	-0.25813
Yes	No	Yes	Yes	4	1.974521	4.029964	1.061898	-0.02996
Yes	No	No	Yes	1	0.99683	1.749853	0.514878	-0.74985
Yes	No	No	No	6	2.40253	6.600554	1.937084	-0.60055
No	Yes	Yes	Yes	42	5.552967	44.47033	4.972336	-2.47033
No	Yes	Yes	No	8	2.755891	7.231501	1.834944	0.768499
No	Yes	No	Yes	21	4.267184	19.30949	3.324775	1.690514
No	Yes	No	No	6	2.40253	7.369053	2.084501	-1.36905
No	No	Yes	Yes	20	4.179516	16.88747	3.075983	3.112533
No	No	Yes	No	6	2.40253	7.627184	2.133473	-1.62718
No	No	No	Yes	5	2.200403	7.332716	1.644921	-2.33272
No	No	No	No	10	3.06057	7.772262	1.932065	2.227738