CHAPTER 5
RESEARCH DESIGN AND METHODOLOGY

"Strategic management's apparent weakness seems to be its strength. Its amorphous boundaries and inherent pluralism act as a common ground for scholars to thrive as a community, without being constrained by a dominant theoretical or methodological strait-jacket…[strategy] act as an intellectual brokering entity, which thrives by enabling the simultaneous pursuit of multiple research orientations by members who hail from a wide variety of disciplinary and philosophical regime. At the same time, however, these diverse community members seem to be linked by a fundamental implicit consensus that helps the field cohere and maintain its identity"

Nag *et al*, 2007:952.

5.1 INTRODUCTION

In the previous chapters a foundation of academic research was established. Different opinions were presented within the framework of a continuum of strategy-making approaches. Some opinions could be regarded as direct opposites, whereas some were similar despite varying denotations and terminology. Where the gists of opinions were related, the theories and ideas were grouped. These main lines of thought came together in two opposites on a continuum of strategy-making approaches, namely the rational planning and emergent strategy approach. The empirical part of this study set out to classify strategy-making approaches followed in South African organisations somewhere on this scale of modes.

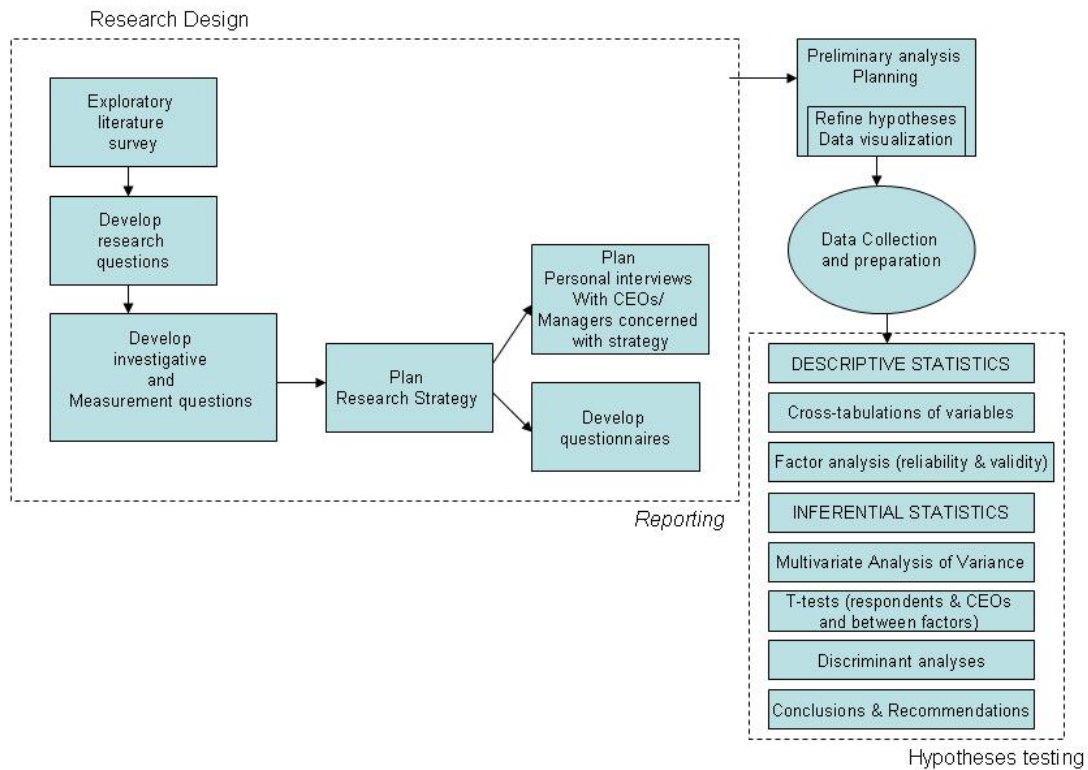Figure 5.1. depicts the research process followed throughout this study.

Figure 5.1 Research Design

(*Source:* Own compilation)

This chapter aims to provide insight into the practical methods employed in gathering data for the empirical part of this study. This is a formal study which highlights research problems and hypothesis statements, involving precise procedures and data source specifications. In this chapter the problem statement, objectives of the study, hypotheses and data collection and analysis methods are explained and discussed.

5.2 PROBLEM STATEMENT

The background of the study sketched a debate about the nature of strategy-making. The articulated arguments for and against certain approaches to strategy-making that emerged from the literature study suggested that strategy-making does not occur in one way only in practice. It therefore suggested that there are many faces to strategy-making in organisations. A continuum of opposite approaches to strategy-making was formulated from differing academic opinions. The research problem shapes around what strategy really looks like in organisations and specifically South African organisations. Is the diversity discovered in literature reflected in the nature of strategy-making in organisations? And in investigating strategy-making in organisations which of the two opposite approaches to strategy-making would be more prominent? Finally, how can we describe the approach to strategy-making in organisations?

The research questions that this study addressed are the following:

- What is the mode of strategy-making followed in South African organisations?
- How specific are the ends developed as part of the strategy-making process?
- How specific are the means developed as part of the strategy-making process?
- How flexible are the planning structures in terms of planning time frame and tolerance for change?
- Is there agreement on strategy performance and strategy-making in organisations?
- What are the factors influencing the degree of agreement among organisational members about strategy-making in their organisation?

- What influences the unconscious or conscious selection of a mode of strategy-making?
- Is there a correlation between strategy-making mode and profitability or organisational performance?
- To what extent do specific moderating factors influence strategy-making in organisations?

5.3 RESEARCH OBJECTIVES

The primary and secondary research objectives of the study are presented below.

5.3.1 Primary objectives

The primary objective of the study is to:

- Investigate and describe the mode of strategy-making followed in South African organisations.

5.3.2 Secondary objectives

The secondary objectives of the study are to:

- Describe internal organisational dynamics (perceptions among managerial levels, training in strategy, age, education) influencing the perceptions on strategy-making.
- Determine if specific factors (as extracted from the literature) influence the advancement of a specific mode of strategy formation in South African organizations.
- Determine the influence of strategy-making approaches on organisational performance and profitability.

- Crystallise a theoretical frame for organising and describing strategy.

5.4 HYPOTHESES

The term "hypothesis" has two different meanings in research literature (Leedy & Ormrod, 2005:270). The meaning denotes a "research hypothesis" on the one hand and a "statistical hypothesis" on the other. A research hypothesis is a consequence of the research problem, and as such can be defined as "a reasonable conjecture, and educated guess", which provides the researcher with an objective or logical framework that guides the collection and analysis of data (Leedy & Ormrod, 2005:270).

"Testing a hypothesis", however, refers to a "statistical hypothesis", usually the *null* hypothesis. The latter postulates that any result observed is the result of chance alone. By convention, explain Diamantopoulos and Schlegelmilch (2000:136), a null hypothesis is always given the benefit of the doubt and is *assumed* to be true unless it is rejected as a result of the testing procedure. In testing hypotheses the aim is to examine whether a particular proposition concerning the population is likely to hold or not. An alternative hypothesis (or research hypothesis) is the complement of the null hypothesis and postulates some difference or inequality. Alternative hypotheses which, in addition to the existence of differences, also indicate the direction of the expected differences are known as *directional hypotheses*. The formulation of directional hypotheses presupposes greater knowledge about the issue at hand based on theoretical work and/or empirical evidence (Diamantopoulos & Schlegelmilch, 2000:136). Directional hypotheses for this study were formulated for hypotheses where the literature review indicated a specific direction, i.e. H4a and H6a.

The following hypotheses were formulated from the research objectives:

Null hypothesis 1(H1o):	The actual mode of strategy-making in SA organisations cannot be clearly identified
Alternative hypothesis 1 (H1a):	The actual mode of strategy-making in SA organisations can be clearly identified

The following secondary hypotheses are stated for the study:

H2o:	Perceptions on strategy-making mode do not vary across managerial level
H2a:	Perceptions on strategy-making mode vary across managerial levels.
H3o:	There is no correlation between perceptions on strategy-making mode and strategy training of an individual
H3a:	There is a correlation between perceptions about strategy-making mode and strategy training of an individual
H4o:	There is no correlation between the size of an organisation and perception on strategy-making mode
H4a:	The larger an organisation the more likely that the rational planning approach to strategy-making is followed

H5o: There is no correlation between stability of industry and the strategy-making approach followed

H5a: There is a correlation between stability of industry and the strategy-making approach followed

H6o: There is no correlation between the involvement of the CEO in strategy-making and the strategy-making approach followed

H6a: Organisations where the CEO determines the strategy are more likely to follow the rational planning approach to strategy

H7o: Strategy-making approaches do not influence organisational performance or profitability.

H7a: Strategy-making approaches influence organisational performance or profitability.

Table 5.2 illustrates the linkages between the research objectives, hypotheses and the questions asked in the questionnaire.

Table 5.2 Research organisation (Research Objectives, Hypotheses and measurement questions)

RESEARCH OBJECTIVES	HYPOTHESES	SURVEY QUESTIONS (Measurement)
1.1 *Investigate and describe the mode of strategy-making followed in South African organisations.*	H_{1o} The actual mode of strategy-making in SA organisations cannot be clearly identified	B1-5 C1-7 E1-7
	H_{1a} The actual mode of strategy-making in SA organisations is can be clearly identified	
2.1 *Describe internal organisational dynamics (perceptions among managerial levels, training in strategy, age and education) influencing the perceptions on strategy-making.*	H_{2o} Perceptions on strategy-making mode do not vary across managerial level	A4-7
	H_{2a} Perceptions on strategy-making mode vary across managerial levels.	
	H_{3o} There is no correlation between perceptions on strategy-making mode and strategy training of an individual	

	H3a There is a correlation between perceptions about strategy-making mode and strategy training of an individual	
2.2 *Determine if specific factors (as extracted from the literature) influence the advancement of a specific mode of strategy formation in South African organisations*	*H4o* There is no correlation between the size of an organisation and perception on strategy-making mode	
	H4a The larger an organisation the more likely that the rational planning approach to strategy-making is followed	
	H5o There is no correlation between stability of industry and the strategy-making approach followed	A1-3 E7
	H5a There is a correlation between stability of industry and the strategy-making approach followed	

	H6o There is no correlation between the involvement of the CEO in strategy-making and the strategy-making approach followed	
	H6a Organisations where the CEO determines the strategy are more likely to follow the rational planning approach to strategy	
2.3 *Determine the influence of strategy-making approaches on organisational performance and profitability.*	*H7o* Strategy-making approaches do not influence relative organisational performance or profitability.	D 33-35
	H7a Strategy-making approaches influence relative organisational performance or profitability.	
2.4 *Crystallise a theoretical frame for organising and describing strategy*	Literature review - described in Chapters 2, 3 and 4	

Hypotheses testing

In this study a combination of deductive and inductive reasoning is used to explain the hypotheses. Deduction is explained as "a form of inference that purports to be conclusive" (Cooper & Schindler, 2003:36), or "the logical process of deriving a conclusion about a specific instance based on a known general premise or something known to be true" (Zikmund, 2003:736). The conclusions must therefore follow from reasons said to imply the conclusion and represent a proof. The data collected was analysed and conclusions deduced to provide proof to either refute or accept hypotheses. Induction occurs where conclusions are drawn from one or more particular fact or piece of evidence (Cooper and Schindler, 2003:37). Inductive reasoning can be defined as "the logical process of establishing a general proposition on the basis of observation of particular facts" (Zikmund, 2003:738). In this study deduction and induction are used in reasoning in a sequential manner, described as "double movement of reflective thought". Inductive reasoning is used where data analysis suggests relationships and provides proof to deduce certain conclusions about the hypothesis but more explanation is needed about the reasons for a relationship to exist.

The empirical findings are presented in Chapter 6 in order to deduce conclusions about the hypotheses. The hypotheses testing procedure is carried out in Chapter 7 where the null or alternative hypotheses are accepted or rejected and conclusions drawn. According to Zikmund (2003:500) the **significance level** is a critical probability in choosing between the null hypothesis and the alternative hypothesis. The level of significance determines the probability level (0.05 or 0.01) that is to be considered too low to warrant support for the null hypothesis. On the assumption that the null hypothesis being tested is true, if the probability of occurrence of the observed data is smaller than the level of significance, then the data

suggests the null hypothesis should be rejected. In other words, there is evidence to support contradiction of the null hypothesis, which is equivalent to supporting the alternative hypothesis. The probability level can either be called the level of significance (e.g. 5% level of significance) or the level of confidence (e.g. 95% confidence level) or the Greek letter alpha, α (e.g. 0.05 alpha level) (Zikmund, 2003:501).

In this study three factors were determined through factor analysis (explained in sub-section 5.6.1 and the factors are described in Chapter 6). Since all three factors are weakly correlated (refer to Chapter 6, sub-section 6.2.4) and thus represent independent aspects of the construct of strategy-making, hypothesis testing has to take this into account. Therefore if one or more of the factors proved to be significant, the null hypothesis is rejected even if the other factor/s was/were not significant. This is because each one of the factors individually describes some critical part of the construct of strategy-making.

5.5 RESEARCH METHODOLOGY

The research methodology presented below details the data required and the data collection methods.

5.5.1 Data required

The following sections outline the sampling method, including the unit of analysis, sample size, sample frame and sample selection.

5.5.1.1 Unit of analysis

According to Cooper and Schindler (2001:163) a unit of analysis is a population element. Together units of analysis, variables and values make up the data under investigation (Diamontopoulos & Schlegelmilch, 2000:1). In this study an individual, an employee of a South African organisation, is used as the unit of analysis. These subjects were approached as respondents since they have first-hand knowledge of how the organisation conducts strategy. Their subjective responses to variables (characteristics studied) are recorded as values to be analysed and to provide information on the topic of interest.

5.5.1.2 Sample frame

A *non-probability purposive/judgmental* sample has been used (meaning the sample was arbitrarily and subjectively selected (Cooper & Schindler, 2001:166) using judgment to select cases that will best enable the researcher to answer her research questions and meet objectives (Saunders Lewis & Thornhill, 2007:230). Because strategy is regarded as a confidential and sensitive area of research in most organisations, the study was in some instances met with resistance from organisations that were approached to participate in the research (especially where organisations operated in highly competitive environments). Participating organisations and consequently their employees were therefore selected arbitrarily based on the access that the researcher had to either the CEO (through prior established relationships or network contacts) or a strategically positioned manager that directly influenced strategy-making in the organisation.

Although the sample was selected arbitrarily, the sample elements were still selected based on their adherence to certain criteria - making it a purposive

sample. The criteria that were used, related to the organisation where the respondent was employed. The purposive sample was furthermore *heterogeneous* in nature to enable the researcher to collect data to describe and explain the key themes that can be observed. Saunders *et al* (2007:232) note that in a heterogeneous purposive sample any patterns that do emerge are likely to be of a particular interest and value and represent key themes. The sample had to be selected based on diverse characteristics of the South African organisations concerned. In this study the outcome of the research is in the form of a description of strategy-making approaches as concluded from data collected and analysed.

As denoted in the title of the study, the *population* under the research magnifying class is South African organisations. Strategy is not confined to one type of organisation only. As such organisations from different sectors (private, government, parastatal) were included, although most of the organisations were either private organisations or parastatals (i.e. partly state owned).

A critical criterion was that the organisations concerned should have some type of strategy, implying an approach to strategy-making would be evident. Since the literature review showed that not only the more visible rational planning approach but also more emergent approaches are evident in strategy-making, the existence of any type of strategy could not necessarily be ascertained beforehand. This means that in some organisations strategy-making would be articulated and documented while in others strategy could be more implied and less visible. Therefore all organisations should fall within the sample frame as the assumption is that any type of strategy-making approach falls within the study's definition of strategy and not just

formal rational planning. However, since the literature suggests that certain influencing or moderating factors determine the type of strategy-making mode to be followed, such as size of organisation, this was also used as a selection criterion.

The organisations that were approached can all be regarded as successful in their industries. Some of these organisations record billions of Rands turnover per year ($1≈R7.51), most had positive profit and growth figures for the last book year and most were in business for longer than 5 years. The positive performance factors also influenced their inclusion in the sample, since the possibility of relating strategy and strategy-making approach to performance (although not an explicit research objective) was also born in mind.

5.5.1.3 Sample selection and sample size

Interviews were held with seventeen CEO's or managers involved in strategy (of which eleven CEO's, including two directors). Each interviewee was requested to distribute questionnaires evenly between management (top-, middle and lower level management) and non-management level employees in his/her organisation. Ten to twenty questionnaires (depending on the organisational size) were distributed per organisation in order to spread respondents across several organisations and increase research validity. Some questionnaires were also distributed among individual organisations from an organisational database to which the researcher had access. A total of 210 questionnaires (including 17 questionnaires captured after interviews with interviewees) were returned.

The CEO/manager concerned with strategy that was interviewed represents an informant rather than a respondent. An **informant** can be defined as "one asked to provide information about a situation to which he or she has privileged access" (Julian and Ofori-Dankwa, 2008:102). A **respondent** is one asked to express a personal opinion (Julian and Ofori-Dankwa, 2008:102).

5.5.2 Method of data collection

Cross sectional research was conducted where a particular phenomenon, namely strategy-making approach, was studied at a particular time (Saunders *et al*, 2007:148). Cross sectional studies often employ the survey strategy (Easterby-Smith et al, 2002) and seek to describe the incidence of a phenomenon or to explain how factors are related in different organisations.

Mixed model research was used where both quantitative and qualitative data collection techniques and analysis procedures were used and combined (Saunders *et al*, 2007:146). In this study qualitative data obtained through semi-structured personal interviews were "quantitised" (Saunders *et al,* 2007:146) and converted into numerical codes that could be analysed statistically. The outcomes of the interviews were firstly recorded in minutes and important issues captured in an excel spreadsheet and secondly, questionnaires were completed on behalf of the interviewee after the interview. The latter data sets (called the "informants") were then compared to the first group of respondents.

The research consisted of the following steps in the data collection phase:

1. In depth interviews with CEO's or managers directly involved in strategy-making were held. The discussions were qualitatively analysed in order to get a picture of the important issues that were addressed regarding strategy-making in organisations.

2. Critical aspects about the research question addressed in the interviews were captured in an excel spreadsheet.

3. Questionnaires were completed by the researcher on behalf of the interviewees based on the researcher's perceptions from the interviews.

4. A questionnaire was administered to about 200 respondents from different levels of the organisations concerned. This provided quantitative data which when analysed statistically allowed the comparisons between key variables, determination of correlations etc.

5.5.2.1 Questionnaires/Surveys

A survey or questionnaire is usually associated with the deductive approach (Saunders *et al.* 2007:138) and was used in this study as such.

Survey instrument

A questionnaire was developed to transcribe research questions into measurement questions (A copy of the final instrument is provided in Appendix A).

The questionnaire was in part based on a questionnaire developed by Brews and Hunt (1999). Brews and Hunt set out to specifically test the impact of

the environment on planning and planning capabilities of the organisation. They analysed the planning practices of 656 firms. Their focus was specifically on establishing the moderating impact of environment on the planning performance relationship. This study's focus is different in the sense that it wants to describe the strategy-making approach followed in organisations. However, the relevance of the study by Brews and Hunt lies in their decomposition of planning along a continuum of learning and formal planning into means and ends specificity and flexibility. This is highly relevant because it describes the two opposing ends to strategy-making in terms of outcomes, namely ends and means (as explained in Chapter 3).

Accordingly, five closed-ended *Guttman type scales* measuring ends specificity and four measuring means specificity were developed. Statements ranging in choices from unspecified to very specific were presented and in every scale but one respondents chose *one* statement that best described his/her organisation. Individual scores were summed to obtain the overall means and ends specificity scores. Scale statements were constructed to capture the differing properties of ends and means as characterized by the Synoptic and Incremental models (Brews & Hunt, 1999:893). These models correspond with the rational planning and emergent approach to strategy-making. Organisations with very specific ends would have many, precisely quantified, and formally documented, time-limited ends, ranging from a statement of firm mission to statements of specific market share/sales growth targets and other key result areas. Very specific means would be reflected in plans that set out exact programmes for implementation, describing in detail the actions and steps required for implementation. These means would be formally documented and distributed among organisation members. Conversely, few broad ends that change and evolve as conditions dictate would characterize less specific ends, while unspecified means would

be broad and unstructured, evolving as circumstances warrant and acting as loose guides only.

Guttman (1944:140) defines a scale as the multivariate frequency distribution of a universe of attributes for a given population of objects, given that it is possible to derive from the distribution a quantitative variable with which to characterize the objects such that each attribute is a simple function of that quantitative variable. Such a quantitative variable is called a scale variable. The basic concept of theory of scales is that of the universe of attributes. The universe is the concept whose scalability is being investigated. Another way of describing the universe, says Guttman (1944:141) is to say it consists of all the attributes of interest to the investigation which have a common content, so that they are classified under a single heading which indicates the content. According to Dane (1990:277) Guttman scales may also be used to test theories that involve assumptions about ordered categories. In this study the literature review was organized to present distinct categories of strategy-making approaches and associated measurable and visible outcomes which were then ordered into Guttman scales for measurement.

Guttman scales were developed to test:

- Ends specificity;
- Means specificity;
- Ends flexibility;
- Means flexibility.

Additional four point scales were developed to test perceptions on strategy and firm performance.

The majority of the survey instrument items contained the above-mentioned intact scales used in the Brews and Hunt study. These were supplemented with scales based on the literature study that used the opposing strategy-making approaches as foundation. Scales based on the concept of *semantic differential scales* were developed for this purpose. The semantic differential scale, defined by Dane (1990:277) as designed to measure the psychological meaning of concepts along three different dimensions: evaluation, potency and activity. It is used to measure what someone believes a specific concept to be – in other words, the subjective meaning of a concept. The meaning of the concept being measured is defined by the general dimensions of evaluation, potency and activity. Evaluation refers to the overall positive or negative meaning attached to the concept. Potency refers to the overall strength or importance of the concept. Activity refers to the extent to which the concept is associated with action. In the questionnaire concerned certain characteristics of the different approaches to strategy as extracted from literature were tested in pairs. These adjectival statements were worded in polar opposites (as shown in figure 5.2). Respondents first evaluated the options on both ends of the scale and then indicated the strength of their association with a specific characteristic in relation to what is done in the organisation. Figure 5.2 serves to illustrate one such scale contained in the questionnaire.

Consider how strategy is formed in your organisation and your organisation's approach to strategy. Study the <u>idea</u> carefully and mark your opinion.

Choose the *one* statement that you rather support and then determine the strength by marking *either* a 1 or 2 for the left hand statement **OR** a 3 and 4 for the right hand statement.

Statement	Or				Statement
Low degree of risk taking is preferred	1	2	3	4	Greater degree of risk taking is preferred

Figure 5.2 Sample semantic differential scale

The questionnaire (Appendix A) contains the following areas of measurement questions:

Measurement area	Questionnaire section	Variables
Demographic details	Section A	1- 15
Ends specificity	Section B	16-25
Means Specificity	Section C	26-29
Ends and Means Flexibility	Section C	30-32
Organisation performance measures	Section D	33-41
Approach to strategy	Section E	42-48

Response rate

Within the targeted sample 20 interviews were requested with CEO's or management concerned with strategy, 17 out of these (i.e. 85%) were granted. The CEO's/managers distributed about ten to 20 questionnaires each in their organisations and 12 of these organisations (i.e. 71%) returned the distributed questionnaires. Questionnaires distributed in this way totaled 225 and 155 of these were returned. This constitutes a response rate of 69%. These 155 questionnaires were supplemented with 38 questionnaires from employees from other organisations, whom have been trained by University of Pretoria lecturers from the department of Business Management or were on the department's database and responded to a request to participate. Questionnaires were also completed for the CEO's/managers interviewed. This brings the total of questionnaires to 210.

Reliability and validity

Underpinning the research endeavours is the question of credibility. The researcher has to ensure that the evidence and the conclusions can be relied on and are valid. The measurement instrument therefore needs to be tested for reliability and validity. The internal validity and reliability of the data collected and the response rate achieved depend, to a large extent, on the design of the questions and the structure of the questionnaire. A *valid* questionnaire will enable accurate data to be collected, and one that is *reliable* will enable data to be collected consistently. *Internal validity* in relation to questionnaires therefore refers to the ability of a questionnaire to measure what the researcher intends it to measure. The literature on research design identifies three ways to ensure validity, namely content validity; construct validity; and criterion validity (Saunders *et al,* 2007:366).

The following steps were taken to ensure content, construct and criterion validity:

1. *Ensuring content validity:* Content validity of a measuring instrument is the extent to which the instrument provides adequate coverage of the concept (Cooper and Schindler, 2001:211). Judgment of what 'adequate coverage' entails can be made through careful definition of the research through literature reviewed (Saunders *et al*, 2007:366). Scrutiny of the literature has been done prior to the development of the questionnaire. Furthermore, the prior use of the questions by Brews and Hunt (1999) indicated its usefulness in testing ends and means specificity and flexibility as well as performance related to strategy-making approaches. The questions were also supplemented after careful consideration of the literature reviewed.

2. *Ensuring construct validity:* Construct validity refers to the extent to which a measurement question actually measures the presence of the constructs that the researcher intended it to measure (Saunders *et al*, 2007:367). According to Cooper and Schindler (2001:214) factor analysis can help determine the construct adequacy of a measuring instrument. A factor analysis was done for this study on the data to describe the large number of variables contained in the questionnaires by means of a smaller set of composite variables (so called 'factors') and to aid in the substantive interpretation of the data (Diamantopoulos and Schlegelmilch 2000:216). A high Cronbach's Alpha coefficient, usually above 0.7 is regarded as indicating construct validity. The result of the factor analysis presented in Chapter 6 proves high construct validity. Factors showed Cronbach's Alpha coefficient's for the factors of 0.80, 0.87 and 0.90. The variance explained by the factors in the questionnaire totaled 56% and also shows a high level of

construct validity. The instrument can therefore be seen to test the concept of strategy-making approach.

3. *Ensuring criterion validity:* Criterion validity, or predictive validity, is concerned with the ability of the measures to make accurate predictions. In assessing criterion validity data from the questionnaire should be compared to specified criteria through statistical analysis such as correlation (Saunders *et al,* 2007:267). In this study, correlation analysis as well as discriminant analysis (detailed in Chapter 6) proved that predictions can be made and that significant relationships do exist.

As far as reliability is concerned, Zikmund (2003:300) states that reliability refers to the degree to which measures are free from error and therefore yield consistent results. One of the most frequently used methods to calculate internal reliability is Cronbach's Alpha coefficient. As mentioned above, the factor analysis yielded high Cronbach's Alpha coefficient. Cronbach's Alpha coefficients were also calculated in an exercise separate from the factor analysis for each section in the questionnaire. Cronbach's Alpha coefficient yielded for that exercise varied between 0.73 (lowest) and 0.89 (highest). These results were merely calculated to ascertain questionnaire reliability and are not recorded in Chapter 6. However, the high Cronbach's Alpha coefficient scores prove that the questionnaire was both valid in terms of accuracy and reliable in terms of consistency.

5.5.2.2 Semi-structured interviews

Semi-structured interviews were held with seventeen CEO's or managers concerned with strategy. The researcher had a list of themes and questions to be covered, mostly concerning the type of strategy-making approach

followed in the particular organisation. The questions varied from interview to interview, based on the organisational context in relation to the research topic. In some interviews additional questions were required to explore the research question and objectives within a specific organisation. However, since the interviews were held with so-called "informants" the interviewee's perceptions guided the conduct of the interview (as explained in Saunders *et al,* 2007:312). The personal interviews varied from 30 minutes to 2 hours (averaging just over one hour).

As mentioned above, the results of the interviews were recorded on an excel spreadsheet as well as a questionnaire (the same as distributed to the respondents) was completed by the researcher based on her perceptions of the interview. The informant data was subsequently analysed and compared with the respondent data.

Reliability and validity

As reliability refers to measures that are free from error and therefore yield consistent results (Zikmund, 2003:300) the following errors (Saunders *et al*, 2007:101) that pose a threat to reliability of interview data were avoided as best as possible:

- *Minimising subject error:* This could occur if subjects for investigation are not representative of the population under study. The CEO's and managers concerned with strategy were regarded as informants and experts in their organisations and all had a prime role to play in strategy-making and as such fully adhered to the sample requirements.

- *Minimising subject response bias:* There was a likelihood that subjects could perceive the topic as confidential and as such could be careful to

avoid issues of a competitive nature. Although the content of strategy was avoided and as far as possible only the process of strategy-making addressed, the subjects were all perceived as highly approachable and open. There was no antagonism between the interviewee and the respondents. In addition, the researcher committed to not publishing or recording any organisation specific responses and only record responses in general.

- *Minimising observer (interviewer) error:* This could happen when more than one person conducts the interviews. In such instances there is potential for different approaches to elicit responses. In this study only one researcher conducted the interviews throughout. Furthermore the interview results as interpreted by the researcher were captured and questionnaires completed for each informant. Questionnaires for group 1 (respondents) and group 2 (informants) were statistically tested for differences of which none were found.

- *Minimising observer bias:* This could happen where replies are interpreted differently. The semi-structure of the interview as well as the one researcher conducting and interpreting the interview obviated this error from occurring. The results of the interviews were also captured on questionnaires. This data set was compared for statistical differences with the first group to establish whether the interviews were accurately interpreted.

5.6 ANALYSIS

Data processing commences with the editing and coding of the data. Editing involves checking the data collection forms for omissions, legibility and consistency in classification (Zikmund, 2003:72). This was followed by data capturing and processing by the Department of Statistics (Unit for Research

Support) at the University of Pretoria. The SPSS statistical package of the SAS software was used to conduct the statistical analyses.

Data analysis usually involves reducing accumulated data to a manageable size, developing summaries, looking for patterns and applying statistical techniques in order to answer research questions. Scale responses to questionnaires often require the analyst to derive various functions, as well as to explore relationships among variables (Cooper & Schindler, 2001:82).

5.6.1 Factor analysis

It was explained in section 5.5.2.1 that factor analysis was done to test reliability and validity of the measurement instrument. A factor analysis, according to Cooper and Schindler (2001:591) is a general term for several specific computational techniques that have the objective to reduce to a manageable number many variables that belong together and have overlapping measurement characteristics. The purpose of factor analysis is to examine the correlations among a number of variables and identify clusters of highly interrelated variables that reflect underlying themes, or *factors*, within the data (Leedy & Ormrod, 2005:274). Factor analysis brings about a matrix of inter-correlations among severable variables, none of which is viewed as being dependent on each other. The correlations matrix provides the relationships on which a new set of variables is constructed. Variables are transformed through principle component analysis into a new set of composite variables, called factors, which are not correlated with each other. These factors account for the variance in the data as a whole (Cooper & Schindler, 2001:591).

The Cronbach's Alpha coefficients produced as a result of the factor analysis can be viewed as a way to measure of reliability (as mentioned previously). It can estimate the proportion of true score variance that is captured by the items by comparing the sum of the item variances with the variance of the sum scale. In can be computed using the following equation:

$$\alpha = (k/(k-1))*[1 - \sum (S_1^2)/S^2 sum]$$

If there is no true score but only error in the items (which is esoteric and unique and therefore uncorrelated across subjects), then the variance of the sum will be the same as the sum of variances of the individual items. Therefore, coefficient alpha will be equal to zero. If all items are perfectly reliable and measure the same thing (true score) the coefficient alpha is equal to 1 (Cooper & Schindler, 2001:591).

The key descriptive results obtained from a factor analysis are the eigenvalues and the above-mentioned factor loadings or Cronbach's Alpha coefficients. Eigenvalues, which equals the sum of the squared loadings for the variables on that factor, provide a measure of the percentage of variance in contributing variables that is explained by the factor. The importance of the component or factor is measured by the size of the eigenvalue in relation to the total variance available for distribution. The next step is to find the factor independent of the first factor that will exact most of the remaining available variance.

5.6.2 Descriptive statistics

Descriptive statistics are those techniques and methods used to describe or summarise the characteristics of a population or a sample (Zikmund, 2003:736). The aim of descriptive statistics is to investigate the distribution

of scores for each variable and to determine whether the scores on different variables are related to each other (Terre Blanche & Durrheim, 2002:105).

Simple correlation analysis

Data was measured for associations using simple correlation analysis. As part of describing the data in the sample cross tabulations, also known as contingency tables, were used. These allow for the examination the interdependence between variables in a simple correlation analysis. For these simple correlation analyses two-way contingency tables (cross-tabulations) were presented with chi-square (x^2) or goodness-of-fit tests performed to find out how likely it is that two variables are associated. The chi-square (x^2) allows for the testing of significance in the analysis of frequency distributions. It is based on the comparison of the observed values in the table with what might be expected if the two variables were independent of each other. It can be interpreted as constituting a significant difference between variables. The chi-square test calculates the probability that the data in a table could occur by chance alone (Saunders *et al,* 2007:430; Zikmund, 2003:510). Cross tabulations provide important insight into important data patterns (Cooper and Schindler, 2003:225). Cross tabulations were performed for variables in the data set to show interdependence and are presented in Chapter 6.

Multiple bar charts (also known as compound bar charts) are used to compare variables. Percentage component bar charts and comparative proportional pie charts are used to compare proportions between variables (Saunders *et al,* 2007:429) in Chapter 6.

5.6.3 Inferential statistics

Inferential statistics is used to make inferences or judgments about the population on the basis of the sample (Zikmund, 2003:738). While descriptive analysis allows the researcher to generalize from the sample to the population, inferential analysis allows the researcher to draw conclusions about the population on the basis of data obtained from samples (Terre Blanche & Durrheim, 2002:105).

The following techniques were used in this study to perform inferential statistics:

- Non-parametric Mann-Whitney test,

- Correlation analysis,

- Multi-way Analysis of Variance (MANOVA),

- linear discriminant analysis,

- logistic regression analysis,

- Regression analysis (MARS).

5.6.3.1 Mann-Whitney test

A non-parametric test is designed to be used when data is not normally distributed and is most often used with categorical data (Saunders *et al,* 2007:441). The Mann-Whitney (or ranked-sum) test is a non-parametric test that allows for testing group differences when the populations are not normally distributed or when it cannot be assumed that the samples are from populations that are equal in variability. It is an alternative to the t-test for two independent samples (Zikmund, 2003:543). The Mann-Whitney test is used in this study to examine group differences between the informants and the respondents. This is done to establish whether the perceptions

captured in the data sets between the CEO's (expert opinions) and the respondents correspond with each other. The Mann-Whitney test is also applied in a multivariate analysis between certain approaches to strategy extremes compared to the three factors. This is done to establish whether there are significant differences between each of the factors in terms of the tested variables.

5.6.3.2 Multivariate techniques for the analysis of dependence

The following techniques were used to simultaneously analyse more than two variables: multivariate ANOVA; discriminant analysis (linear and logistic).

ANOVA (Analysis of variance)

Multivariate analysis of variance (ANOVA) is a statistical technique that provides a simultaneous significance test of mean differences between groups, made for two or more dependent variables (Zikmund, 2003:584). Multivariate ANOVA was done to test the factors against multiple variables in the data set.

Discriminant analysis

A discriminant analysis is defined as a statistical technique for predicting the probability that an object will belong in one of two or more mutually exclusive categories (dependent variable) based on several independent variables (Zikmund, 2003:579).

To calculate discriminant scores for a dependent variable, the following linear function is used:

$$Z_i = b_1X_{1i} + b_2X_{2i} + \ldots + b_nX_{ni}$$

In the computation of the linear discriminant function, weights are assigned to the variables such that the ratio of the differences between the means of the two groups to the standard deviation within groups is maximized. The standard discriminant coefficients, or weights, provide information about the relative importance of each of these variables in discriminating between two groups. A goal of discriminant analysis is to perform a classification function (Zikmund, 2003:579).

Linear discriminant analysis was performed for organisational profitability and performance using respective factors to predict the likelihood of an organisation to perform in a certain way.

Logistic regression analysis

Regression analysis is a technique that attempts to predict the values of continuous, interval-scaled, ratio-scaled dependent variable from the specific values of the independent variables (Zikmund, 2003:740). Multiple regression is based on arithmetic and therefore requires quantitative data. The goals of multiple regression are (a) to describe and understand relationships, (b) to forecast (predict) a new observation, and (c) to adjust and control a process (Siegel, 1997:488).

Logistic regression analysis was performed for each factor using specific variables to predict the likelihood of an organisation to display specific strategy-making behaviour.

Multivariate Adaptive Regression Splines (MARS)

Multivariate Adaptive Regression Splines (MARS) is an implementation of techniques for solving regression-type problems. MARS is a non-parametric regression procedure that makes no assumption about the underlying functional relationship between the dependent and explanatory variables. Instead, MARS constructs this relation from a set of coefficients and basis functions that are entirely based on the regression data. The method is based on a partitioning strategy, which partitions the input space into regions, each with its own regression equation. This makes MARS particularly suitable for problems with higher input dimensions, i.e. with more than two variables (Hastie, Tibshirani and Friedman, 2001).

MARS was done to determine circumstances (based on certain variable values) which would either improve or decrease relative financial and organisational performance.

5.7 CHAPTER SUMMARY

In this chapter the research design and methodology were explained. The research question, objectives and hypotheses were presented and explained. The methodology followed for the empirical part of the study was also presented with specific description of the sample (size, frame and selection), the measurement instruments used (questionnaires and semi-structured interviews), the descriptive statistics as well as the inferential statistics applied to investigate and describe the research constructs.

Chapter 6 subsequently presents all the findings obtained by applying the research methodology as explained in Chapter 5.

CHAPTER 6
RESEARCH FINDINGS

6.1 Introduction

6.2 Empirical findings: Descriptive statistics

6.2.1 Sample and response rate

6.2.2 Demographics

6.2.3 Additional descriptive statistics

6.2.4 Factor analysis

6.3 Empirical findings: Inferential statistics

6.3.1 Multi-way analysis of variance (ANOVA)

6.3.2 Mann-Whitney test between group 1 and group 2

6.3.3 Multivariate statistics: Judging approach to strategy-making

6.3.4 Predicting dependent variables

6.3.4.1 Linear discriminant analysis

6.3.4.2 Multivariate adaptive regression splines (MARS)

6.3.4.3 Logistic regression analysis

6.4 Interviews with informants

6.4.1 Summary description of interviews

6.4.2 Other issues addressed during the interviews

6.5 Chapter summary

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