DETERMINATION OF THE KEY OPERATIONAL VARIABLES OF CONSTRUCTION COMPANIES THAT IMPACT ON THEIR CORPORATE PERFORMANCE

By

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ABSTRACT

Small building contractors in South Africa often struggle to produce quality work on time and have a high rate of business failure. In an effort to improve the effectiveness and viability of smaller construction firms in South Africa, this research investigates key operational variables affecting their corporate financial performance.

Operational variables relevant to financial performance were identified through a literature review. A questionnaire was then designed to assess the extent to which these variables are perceived to influence the financial performance of construction companies. The study participants were technical and management staff at small and medium-sized building and civil engineering construction companies categorized from grades 2 to 6 on the South African Construction Industry Development Board (cidb) registers, in four provinces of South Africa. Sixty-two valid responses were received.

Based on how the respondents rated the variables in the study, it appears that contractors generally perceive four factors as having the greatest impact on corporate performance: technical ability (the possession and effective use of plant and equipment), financial management skills (in order to accumulate financial capital), training of staff in organizational knowledge in skills transfer and networking with industry stakeholders. Contractors across the five cidb grades did not differ significantly in their ratings of the importance of the operational variables and their indicators. The study also found that the perceived importance of three key operational variables (technical ability, financial capacity and networking) was positively related to the actual financial performance of companies, as measured by turnover, net assets and profit margin.

The study concludes that construction companies need to prioritize the development of these key factors to improve their corporate performance. The findings will be of significance to contractors, industry practitioners, project managers and members of the research community in understanding the key operational variables that are crucial to construction firms' success and effective project delivery.

DECLARATION AND STEMENT OF ORIGINALITY

I hereby declare that this treatise titled “Determination of the key operational variables of construction companies that impact on their corporate performance” is my own work and has not been previously submitted to any university for the award of any degree or examination. I therefore submit this work for the degree of Masters of Philosophy in Construction Economics and Management.

All sources of information incorporated in this research have been duly acknowledged by way of complete referencing.

Signature……..

Date……

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DEDICATION

I dedicate this work to:

My late mother, Madam Mamie Tucker. You occupy a special place in my heart even right now. May your soul rest in perfect peace.

And to:

My daughters, Dyna, Gifty and Jennifer and

My dear wife Mrs Risy Tucker whose love, care and support gave me strength to complete this work.

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GLOSSARY AND ACRONYMS USED IN THE DISSERTION

CA	Current Asset
CDP	Contractor Development Programme
CE	Civil Engineering
CIB	International Council for Research and Innovation in Building and Construction
cidb	Construction Industry and Development Board
CRB	Contractors Registration Board
CSIR	Council for Scientific and Industrial Research
DPW	Department of Public Works
EB	Electrical Building
FA	Fixed Asset
FIN	Finance
GB	General Building
GEOSPR	Geographical Spread
HUMRES	Human Resource
ICD	Institute for Construction Training and Development
ME	Mechanical Engineering (Building)
MENT	Mentoring

NETW	Networking
NRF	National Research Foundation
NSBASA	National Small Business Act of South Africa
PBIT	Profit before Interest and Tax
PM	Profit Margin
PMI	Project Management Institute
ROCE	Return on Capital Employed
RO	Return on Total Asset
SBP	Strategic Business Partnership for Growth in Africa
SME	Small and Medium Enterprises
SMME	Small, Medium and Micro Enterprises
STSZ	Staff Size
TECHAB	Technical Ability
TECHMAS	Technical and Management Skills
TUR	Turnover
WABER	West Africa Built Environment Research

CHAPTER 1: GENERAL INTRODUCTION

1.1 Introduction

The South African construction industry is characterized by poor performance and the inability of small construction firms to deliver quality products. These shortcomings are frequently associated with low productivity and low profit margins that often prevent firms from meeting their financial obligations. High labour turnover, poor mentorship and the loss of skilled labourers have severely limited the technical capability of firms to deliver construction projects on cost, on time and to the standard required by client (Martin & Root, 2012; Thwala & Mvubu, 2008). This research therefore investigates the key operational variables that influence construction firms' performance in the South African construction industry, with a view to improving project delivery. This is premised on the assumption that selection of suitable contractors with adequate capacity and basic technical know-how will enhance effective and efficient delivery of infrastructure to meet the country's demand.

This is consistent with the assertion of (Sari & El-Sayegh, 2007) who argue that the selection of the appropriate contractor with the requisite capacity and capability is a critical and vital task in construction. Therefore, this study employs the constructs of capacity, capability and marketing strategy outlined below as measures of construction companies' operational variables. The argument here is that measures of certain variables may be indicators of levels of capability and stages of enterprise development and performance. Furthermore, based on the poor performance of contractors in South Africa (Dlungwana, Nxumalo, Van Huyssteen, Rwelamila & Noyana, 2002; DPW, 1999; Engineering News, 2005) it is likely that the construction firms lack both the technical expertise and the business networking skills required for superior performance (Martin & Root, 2012; Thwala & Mvubu, 2008).

According to Rush, Bessant & Hobday (2007), operational variables are key abilities needed by firms to turn their technological competence into strategic competitive advantage. They opined that operational variables such as organisational, financial, marketing and technological capabilities are directly proportional to the development of construction firms. Bell (2003) noted that firms' abilities to develop from low levels of capability to higher levels of competence

determines their performance. Contractor performance, as noted by Yang, Hsieh & Li (2009), is evidence of a contractor fulfilling his responsibilities in the contract. In this study the concept of "operational variables" as applied to construction companies is thus taken to mean their capacities and capabilities.

Contractor grading programmes in most developing countries are a means of improving the capacity and capability of contractors, by enabling contractors to gain the necessary competence, experience, track record and financial capital (cidb, 2011; cidb & CETA, 2005). The South African Construction Industry Development Board (cidb) was established by an Act of Parliament, Act 38 of 2000, to provide leadership and to institute registers of contractors based on their previous work experience and financial capability (cidb, 2008b). The focus of this study therefore is to identify indicators/variables that impact on the corporate performance of firms in grades 2-6 on cidb registers of contractors which are also active on contractor development programmes in four provinces of South Africa.

The cidb described itself as a knowledge-based organisation that provides strategic leadership to the construction industry. It promotes sustainable growth, improved performance and best practice for public and private sector clients, which aids procurement and delivery management. It also establishes registration of projects, contractors and suppliers in order to monitor the performance of the construction industry and its stakeholders (cidb, 2008b). It is an institution that capacitates the construction industry in order to meet the demands of building and civil engineering infrastructure projects. This is delivered by domestic firms in a competitive environment for socio-economic development, thereby adding value for money to industry clients (CIB, 1998; Ofori, 2000a).

Contractors play a vital role in any construction project. It is of paramount importance that construction contracting authorities are able to identify contractors' capacities and capabilities to do certain work (Anagnostopoulos & Vavatsikos, 2006). This is also important for infrastructure development more generally. Smallwood (2000) noted that having adequate measures of contractors' capacities and capabilities can improve the performance of construction firms.

Capability, according to Rush *et al.* (2007), is the application of technological transfer in a competitive environment. Thus, capability is the interdependent and interrelated knowledge system of any organization (Barton, 1992). Capability therefore is something that a firm does rather than it possesses (Anagnostopoulos & Vavatsikos, 2006; Antonacopoulou, Ferdinand, Graca & Easterby-Smith, 2005; Zollo & Winter, 2002). It is the reorganisation of the operating routines of a firm in response to change of environment to gain competitive advantage rather than its resources (De Haan, Voordijk & Joosten, 2002).

Zahra & George (2002) noted that capacity is the ability to explore and understand new technologies and apply this knowledge in implementation processes (innovation) (Cohen & Levinthal, 1990; Zahra & George, 2002). It is also referred to as having adequate human resource team (Russell, 1991), technical ability, that is the possession and effective use of plant and equipment (Cohen & Levinthal, 1990) and having financial capital (Abu Bakar, 1993) and level of managerial skills (Hillebrandt & Cannon, 1990). Capacity can therefore be said to include, ability to innovate, having adequate human resource (staff size), technical and managerial skills, technical ability and experience and financial capital.

A construction industry that is effective and efficient often creates employment, improves technological capacity and fosters the growth of small and medium sized enterprises for immediate and sustainable income generation (Hillebrandt, 2000; Ofori, 2000a). The upgrade of the lower level contractors and their placement in the right grade based on their capacity and capability to implement construction projects successfully helps in economic development and also improves the quality of life of the citizens of a country (Hillebrandt, 2000; Ofori, 1993a; Ofori, 1993b).

1.2 Background

Because the contractor plays an important role in the successful implementation of the construction project delivery, the identification of the right contractor with the requisite capacity and capability is essential (Shen, Li, Drew & Shen, 2004). However, the South African construction industry still

faces serious challenges due to the poor capacity of contractors, low productivity and poor quality workmanship, as well as low profit margins in the delivery of infrastructure projects (Dlungwana *et al.*, 2002; DPW, 1999; Engineering News, 2005). Hanson, Mbachu & Nkando (2003) assert that clients' dissatisfaction in the South African construction industry is as a result of contractual dispute, delivering of poor quality products and the incompetency of contractors due to lack of adequate capacities and capabilities in executing construction works. Mbachu & Nkado (2006) and Enshassi, Mohamed & Abushaban (2009) established that the poor performance of contractors in the South African construction industry is as a result of lack of adequate capacity and capability to deliver quality infrastructure.

The South African construction procurement methods which were instituted in 2000 by an act of Parliament, Act 38 of 2000 (Manana, van Waveren & Chan, 2012), make use of contractors that have been categorized based on their capacities, capabilities and previous works by the cidb for infrastructure delivery (Manana *et al.*, 2012). According to a National Stakeholders Forum report (cidb, 2012a), contractors are awarded jobs without having the capacity or expertise to perform. It is also widely believed that the small and medium contractors in South Africa acquire project as a means of security guarantee due to the availability of the projects. However, they are not performing even though they are awarded contracts based on their capacities and capabilities (DPW, 2004; Thwala & Mvubu, 2008). However, the main concern of this research is to examine the key operational variables that impact on the performance of these organisations, hence the grading system is employed to identify organisations that form the unit of study in this research.

Scholars therefore believe that the capacities and capabilities of contractors that impact on their performance in the construction industry are still unknown (DPW, 2004; Thwala & Mvubu, 2008). This is evident in the non-completion of construction projects, project abandonment and the overall dropping out of business by construction firms (cidb, 2013; Hindle, 1990). Rwelamila (2001) refers to contractor development in South Africa as "gate-keeping", rather than enabling contractors to deliver better construction projects based on their capacities and capabilities in their respective grades. He further argues that many Southern African countries are not effectively using their registers, because contractor registration does not allow monitoring of performance and similar support interventions and therefore has little benefit to the construction clients.

According to Statistics South Africa (2005), for the last ten years there has been a pattern of construction companies suffering degradation, experiencing failure and finally dropping out of business due to lack of capacity and capability. The South Africa Construction Industry Report (cidb, 2013) noted high levels of enterprise failure, poor levels of quality and lack of process and productivity in the South African construction industry. High levels of clients' dissatisfaction with the performance of construction firms in South Africa exists (cidb, 2012b). Instances of non-completion of projects, project abandonment and poor contractor performance abound in the South African construction industry (cidb, 2013; Hindle, 1990). According to Manana *et al.* (2012) the tender process involves the invitation of contractors based on their capacities and capabilities (the cidb i-Tender and register of projects are used to advertise tenders (cidb, 2011). It is therefore important that contractors be put in their appropriate grades based on capacities and capabilities, to avoid the inadvertent awarding of jobs to incompetent contractors (Yanick, 2007).

1.3 Problem Statement

Yanick (2007) opined that contractors are sometimes awarded contracts based on their cidb grade, even though they might not have the requisite capacity and capability to perform. Indications also show that a significant number of contractors are not performing due to poor capacities and capabilities (cidb, 2013; DPW, 1999; Smallwood, 2000). In an effort to improve this, government agencies have established developmental programs for small and medium construction firms to improve their performance across the provinces. In spite of these positive initiatives, the level of performance of small and medium construction firms in the industry still calls for more attention. The high number of failures amongst small and medium construction firms undermines the development efforts of Government (Martin & Root, 2012). Nonetheless, the level of technical expertise, business network and performance of these firms is still unknown (Martin & Root, 2012; Thwala & Mvubu, 2008). This research therefore examines the capacities and capabilities of small and medium construction firms and how these affect their performance. Understanding these variables can help improve performance, reduce organizational failures and ultimately help these firms to survive and thrive in the construction industry.

1.4 Research Questions

The main question this research seeks to answer is:

What are the operational variables that are perceived to impact on construction companies' corporate performance?

To answer the main research question the following sub-questions are posed:

i. How are the operational variables perceived to influence construction companies' financial performance?
ii. How do personnel across different cidb grade categories (2 to 6) share the same views on which operational variables influence construction companies' financial performance?
iii. What is the relationship between perceptions of the influence of the operational variables and objective financial performance?

1.5 Aim

The main aim of this research is to examine the operational variables of construction companies and determine whether there are key operational variables that impact their corporate financial performance.

1.6 Research Objectives

The objectives of the study are interrelated with the main and subsidiary research questions outlined above. Therefore the achievement of each objective depends on the responses provided by the respondents. However, this report seeks to:

i. Determine the key operational variables perceived to impact on the corporate financial

performance of construction firms in South Africa.

ii. Determine which of the perceived indicators/variables have a significant effect on the corporate financial performance of construction firms in South Africa.

iii. Compare responses from the different grade categories, to see whether different sized firms have divergent perceptions of the operational variables that impact on their corporate financial performance.

iv. Evaluate the relationship between the perceptions of the influence operational variables and the objective corporate financial performance of construction firms in South Africa.

1.7 Research Proposition

This study proposes that there are key operational variables that impact the corporate financial performance of Small and Medium sized construction organisations (Grade 2 to 6).

1.8 Significance of the study

This research investigates the key operational variables that are responsible for the performance and continuous operation of contractors on the cidb register. The findings will be of significance to contractors, industry practitioners, project managers and members of the research community in understanding the key operational variables that are crucial to effective project delivery.

1.9 Overview of the Research Methodology

The research adopted a descriptive survey approach. Purposive and convenience sampling techniques were used to identify 185 building and civil engineering construction companies based in four provinces of South Africa and registered in grades 2-6 of the cidb contractor grading register. Random selection of companies was not deemed to be appropriate, as there were certain targeted cases that required being included and random selection might have excluded these (Asika, 2002). These special cases were grade 2 to 6 contractors on the cidb grading register and at the same time active on the contractor development programmes in the four provinces. The nature of the sampling means that the result of the findings of the study might not be generalizable to the entire population of construction firms on grades 2 to 6. However, the study design would be able to indicate key

operational variables that impact on construction enterprise performance (Asika, 2002) within the given sample. Purposive and convenience sampling is also deemed, by (Mbachu & Nkado, 2006), to be appropriate for quantitative and qualitative research data and questions. Primary and secondary data comprising questionnaires and bank statements, audited account reports were collected respectively from the respondents themselves. The primary data used in the study was collected from this cohort of respondents through the use of questionnaires. The data was analysed using statistical techniques.

1.10 Scope of the Study

The intellectual scope of the research is in the area of small business management, construction engineering management, knowledge management and contractor development studies. The research is to determine and establish the key operational variables of construction companies that impact on their corporate financial performance. Building and civil engineering grades 2 to 6 contractors registered on the cidb contractor grading register of South Africa were studied and the research targeted only four provinces of South Africa. Housing projects will form the study population as most of the failures of contractor performance seem to be apparent on the public housing projects.

1.11 Research Limitations

This research like all other research is not without limitations. The study aimed at determining the key operational variables used by construction companies that impact on their corporate financial performance. In order to do this, extant literature was reviewed and the relationship between the research constructs was established. The study provides empirical evidence on the influence of key operational variables on corporate financial performance.

The study was limited to small and medium-sized businesses in the building industry. The technical aspect of the building industry was outside the scope of the study and therefore was excluded. Survivalist and micro enterprises were also excluded from the study since they generate income lower than the minimum income standard or the poverty line (Nieman, 2006). The research also did not investigate whether the continuing operations and development of a construction company

depend wholly on the cidb grading system or on their capabilities and capacities as the effective implementation of the grading system is outside the scope of this research. The research was not centred on investigating whether the continuous operations and development of the company depends on its profitability or return on investment, nor was it a response to the public sector's need to demonstrate progress on contractors' development (which are the criteria used in assessing and grading construction companies registered by the cidb).

Furthermore, the study did not seek to compare the findings with the cidb grading criteria for contractors, even though there might be possible problems with the cidb grading criteria that could be responsible for contractors not performing. The study faces a potential limitation due to the subjective and unverifiable nature of the respondents' answers. It is possible that the respondents could have been trying to present their companies in a positive light to the researcher and might not have responded truthfully to all the questions. Possible response bias must therefore be taken into consideration.

Another limitation relates to sampling and representativity. Firstly, in terms of geographical location, the study is limited to urban companies. Rural contractors were excluded. This was because many rural contractors on the cidb grading register are not active on most contractor grading programmes and also could not be easily traced in the field. Secondly, the chosen methodology also is unlikely to represent the population since the sample was not chosen at random. This limits the generalizability of the study's findings to the general population of small construction companies in South Africa (Lærd Dissertation, 2013a).

The grade, category of the study population and province of the study area were excluded as possible variables. The research also did not check for any response bias. In order to generalize the conclusions drawn from this research, caution has to be taken considering the limitations identified in the study and the findings due to the sample size and methodology.

1.12 Assumptions

A number of assumptions are made prior to the research and data analyses which helped to minimize over-generalizations and explanation of obvious facts. The following assumptions were adopted by the study.

- The possession of technical capacity in terms of plants and equipment by construction companies significantly affects their performance (Hatush & Skitmore, 1997; Tam & Harris, 1996).
- Larger, longer-established organizations are more likely to survive than smaller, younger ones (Malinen, 2001).
- Marketing strategy in terms of networking can have a great impact on construction firms' performance (Chell & Baines, 2000; Gilmore, Carson, Grant, O'Donnell, Langley & Pickett, 2006; Jack, Moult, Anderson & Dodd, 2010; Ritter, Wilkinson & Johnston, 2004).
- The difficulties that SME contractors have in attracting finance strongly affect the performance of these companies (Carson, 2006).

1.13 Definition of Terms used in the Study

This section defines all the terms and concepts used in the study.

Building Construction Authority (BCA): A statutory board that regulates building and construction industry as well as championing the development of an excellent built environment. It also promotes building safety and building quality excellence.

Built Environment: Refers to buildings, structures and infrastructure in our surroundings that provide the setting for the community's activities (BCA, 2012; Bubshait & Al-Gobali, 1996). Goodall (2010) refers to it as the physical surroundings, from large infrastructure down to lesser objects like traffic lights, public telephones and pillar boxes.

Construction Management: The study and practice of the managerial and technological aspects of construction business, construction science and construction technology in the construction industry

(Fellows, Langford, Newcombe & Urry, 2002). It is also defined as the management of the physical construction process within the built environment which comprises the co-ordination, administration and management of resources (RSA, 2002).

Construction: This is referred to as the building of infrastructure which includes building construction, industrial construction, commercial buildings and heavy civil construction. It is often a feat of human multitasking in the case of large scale construction (Tendersinfo Blogs, 2013). Ruddock (2002) refers to it as an economic activity directed to the creation, renovation, repair or extension of fixed assets in the form of buildings, land improvements of an engineering nature and other engineering constructions such as roads, bridges, dams and so forth.

Contract: Any written or spoken agreement between two or more parties that is legally binding (Bentall, Beusch & De Veen, 1999).

Contractor development programme: This programme aims to assist both emerging and established enterprises to improve their technical, financial and/or organisational capabilities during the course of a construction project. The programme allows for the development of skills and capacity whilst ensuring that the contract is carried out based on specifications and conditions (Bentall *et al.*, 1999).

Contractor Register: A book in which registered or prequalified contractors is listed (Tasmanian Government, 2001). It is also being employed as a way of screening contractors, assessing and establishing their capabilities and minimizes risk to both the client and the contractor in order to identify their ability to implement different types of construction projects (Bubshait & Al-Gobali, 1996; cidb, 2008b; ICTAD, 2009; Nguyen, 1985; Russell, 1988).

Contractor Registration: A nationally established and recognised system of registering and categorising contractors based on several criteria. The criteria include financial capacity, staffing, equipment held and work experience. Ratings on these criteria allow them to compete for contracts of a specified financial scope and technical complexity (Bentall *et al.*, 1999).

Contractor: Any person or firm that undertakes to execute a contract either in the areas of material supplies or construction or maintenance works (Bentall *et al.*, 1999).

Enterprise: is described as a business in which the owners or managers are enterprising (Cameron & Frost, 2001). In this study, the world enterprise referred to a small and medium sized construction firms.

Mentorship: The availability of guidance, advice and support to emerging and other lower level contractors, assisting them to work and establish themselves in a competitive environment (Bentall *et al.*, 1999).

Performance: The ability of an enterprise/firm to achieve its objectives in terms of customer satisfaction, market share, revenues and profit (Forsman, 2005); an enterprise/firm's capability in satisfying its customers or clients (Laitinen, 2002).

Registration/Prequalification: The establishment of a reliable and objective assessment of the capacity of a contractor to complete certain works. Such assessment helps to optimise the predictability of project outcomes, including time, cost and quality (Tasmanian Government, 2001).

SME: The definition of small-to-medium-sized (SME) enterprises can vary from country to country. Dlungwana *et al.* (2002) described small construction companies in South Africa as those enterprises whose annual turnover is less than ten million Rands (R10 million), whilst medium construction enterprises have turnover ranging between ten million Rands to fifty million Rands (R10 million – R50 million). The National Small Business Act No. 102, (RSA, 1996) defines small construction enterprises as ones that employ between five and fifty employees, whilst medium construction enterprises employ between fifty and two hundred employees. This research therefore defines SMEs based on their annual turnover and the number of permanent employees they have.

SMME: The acronym stands for small, medium and micro enterprises. The National Small Business Act of South Africa (NSBASA) defines these as distinct business enterprises which are not part of a group of companies and which are wholly managed by their owner or owners (which could be a

natural person, a sole proprietorship or partner or a legal person like a close corporation or a company) (Joubert, Schoeman & Blignaut, 1999). According to Berry, von Blottnitz, Cassim, Kesper, Rajaratnam & van Seventer (2002) the term can refer to a wide range of firms, from established businesses employing over one hundred employees, to self-employed owners of informal micro-enterprises.

Subcontractor: A person or firm that takes a contract from the main contractor or employer to carry out work or deliver services, inclusive of labour and supply of materials (Bentall *et al.*, 1999).

1.14 The outline of the research dissertation

This dissertation consists of six chapters, as follows:

- Chapter one provides an overview and background of the research topic, highlighting the key problem of the non-performance of construction companies in South Africa. Based on the problem statement, the research question, research objectives and research methodology are then explained. Lastly the chapter discusses the study's significance, scope, limitations and key assumptions.
- Chapter two presents a review of the literature pertinent to the study. The chapter defines the boundaries of the construction industry and reviews the industry's role in South Africa and other developing countries including the contribution to employment, gross domestic fixed investment (GDFI) and gross domestic product (GDP) in the South African economy. The section continues with an overview of the structure of the construction industry as a whole, as well as the structure of the South African construction industry. This is followed by the review of the study variables of construction companies as identified from the literature. The section further describes corporate performance and its measurement with regards to financial methods of measurement and also highlights the performance variables used in the study. A conceptual framework is developed from the literature to elucidate the relationship between the operational variables and corporate performance as discussed from literature.
- Chapter three discusses the research approach adopted in this study. The method and procedure for administering the questionnaire, methods of data collection and analyses are highlighted. The

various statistical methods used are discussed, namely relative importance index, the mean score method, the Kruskall-Wallis and the Spearman rank correlation coefficient.

- Chapter four presents the results of the data analyses, i.e. the study's findings. The analysed data are presented in tables and figures.
- Chapter five presents the discussion of the findings. It also re-examines the main and sub-research questions as well as the research objectives. This is to ascertain whether the research questions have been answered and objectives achieved.
- Chapter six provides the conclusions and recommendations of the study. It also suggests a framework that is being schematized from the findings of the research and outlines a proposal for future research.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter reviews the literature related to the study. It begins by presenting an overview of the construction industry in terms of its structure and the role it plays in developing countries. It then identifies operational variables used by construction companies. Lastly, it presents a conceptual framework that explains the theoretical relationship between the operational variables and performance variables of construction companies.

2.2 Defining the boundaries of the construction industry and its importance in the South African economy

This section defines the boundaries of the construction industry and its contribution to employment and gross domestic product (GDP) in the South African economy. The construction industry can be regarded as a wide array of industries and sectors which add value in the creation and maintenance of fixed assets within the built environment (Gounden, 2000). It is also described as an institution that develops and maintains the built environment (Gruneberg, 1997) and which exhibits technological linkages and transfer of knowledge between sectors within the industry (Mlinga & Wells, 2002). The Construction industry helps clients to realize better value for money, for products delivered by construction firms through the improvement of domestic construction enterprises (Ofori, 2000a). It serves as one of the pillars of the domestic economy in any country (Xiao & Proverbs, 2002a, 2002b) and as a regulatory arm for government in order to facilitate or slow down economic activities (Edum-Fotwe, Thorpe & McCaffer, 2001). It is also known as a sector which offers services that produces construction products, including inception, design, construction, occupation or operation and demolition phases (PMI, 2004). It is a high risk, low profit making sector and has a track record of much client dissatisfaction (Jha & Devaya, 2008). Similar sentiments expressed by Jha & Devaya (2008) are that the construction industry suffers risk due to political, legal, financial and cultural complexities. Smith (1998) refers to it as an institution of design and build.

Smith (1998's) definition also emphasises construction activity as opposed to design. A wider definition of the construction industry provides a holistic view as one which deals with new

structures and altering, extending, refurbishing, maintaining, repairing and demolishing of existing structures. Structures as described by (Barrie & Boyd, 1978) are said to be residential buildings, commercial or social buildings, roads, civil works and industrial complexes. It is clear from all the definitions above, that the construction industry touches many spheres of human life and contributes to them (Mlinga & Wells, 2002). The foregoing indicates that the construction industry is an important sector of the economy and has multiple backward and forward linkages with other sectors. The construction industry potentially contributes greatly to socio-economic development and employment (Abdullah, Chiet, Anuar & Shen, 2004; Giang & Pheng, 2011). It is a significant indicator of economic activities and is often used by government to stimulate growth or assist in economic recovery from recession. Furthermore, it provides a platform for competition for contractors (Edum-Fotwe *et al.*, 2001).

However, in most developing countries the construction industry has failed to provide a basis for socio-economic development and improved living conditions for the general population (Ofori, 2001). According to the World Bank (1985), the industry has not been "the engine of growth" because of it has failed to provide socio-economic development. Ofori (1991) concludes that contractors in developing nations have poor technical and managerial skills. According to Ofori (2000b) and the CIB (1998), the construction industry should be striving to improve its capacity and effectiveness in delivering building and civil engineering products, so as to support national economic growth and social development. The need for this improvement is addressed by the cidb.

In the United Kingdom the Construction Industry Board is an industry initiative. By contrast, similar institutions in developing countries tend to be government agencies, including the Construction Industry Development Board of Malaysia, the Institute of Construction Training and Development of Sri Lanka, the National Construction Council of Tanzania and Singapore's Building and Construction Authority (Miles & Neale, 1991; Ofori, 2000a). In southern African countries, construction industry development agencies have been formed fairly recently. They are part of a regional initiative to co-ordinate efforts and pool resources where necessary. But many of the institutions are industry inspired, or involve the industry's active participation. These initiatives are likely to survive because the main stakeholders and beneficiaries are actively involved, from the planning stage right through the implementation processes (Ofori, 2000a).

2.2.1 The Role of the Construction Industry in South Africa and Developing Countries

The construction industry is a prime contributor to GDP in any country and its contribution reflects the size of the industry. According to Hillebrandt (2000), the construction industry contributes immensely to GDP, capital formation and employment. Arditi, Akan & Gurdamar (1985), posit that the performance of the construction industry through construction firms underpins the socio-economic development of nations. The contribution of the industry is estimated as 8-14% by Edum-Fotwe, Thorpe & McCaffer (1999), which shows that the construction industry play a vital role in the economy. A study done by the World Bank (1994) confirmed that the expansion of infrastructure and productive facilities in the construction industry also enhances economic growth. The contribution to GDP by construction input through infrastructure delivery alone has been estimated at 3-5% for developing countries and 5-8% for more developed countries (Delgado ‐ Hernandez & Aspinwall, 2005; DTI, 2004; Giang & Pheng, 2011; Lopes, Ruddock & Ribeiro, 2002).

The construction industry is believed to be the prime mover and a kick-start to any economy (Lewis, 2004). Its level of productivity has a significant effect on national economic growth (Chia, Skitmore, Runeson & Bridge, 2010). An examination of the Malaysian economy and construction industry by Rashid & Morledge (1998) revealed that economic growth is directly proportional to the rate of growth of employment. A report by the Malaysian Ministry of Finance, 1988-1996 indicates the growth in construction GDP from 1988 to 1996. This shows that the construction industry employed an increasing number of people, thereby boosting national employment and national economic growth. The construction industry propels socio-economic growth in developing nations through job creation by construction activities and further enhances growth of other sectors including infrastructure delivery (Mlinga & Wells, 2002). Kagioglou, Cooper & Aouad (2001) have, however, argued that the construction industry in most developing countries has a track record of less optimal performance.

The importance of having regulatory boards in developing countries is to keep the construction industry on track (Ofori & Chan, 2000). In South Africa, the body charged with regulating/ promoting/ensuring the growth, development and performance of the construction industry is the cidb. The cidb was established in 2000 in order to evaluate and grade contractors primarily based on their previous work and financial capability in order to enhance performance. An example of the role

of the construction industry board is the Singaporean construction industry board which was formed in 1984. Like any other construction industry development board, it is charged with the monitoring and supervision of the development of the construction industry in Singapore in order to help improve the performance of contractors and to be self-reliant (Ofori & Chan, 2000). From the foregoing, it is evident that the construction industry plays an important role in promoting economic growth through infrastructure delivery.

2.2.2 Contribution of the South Africa Construction Industry

Conforming to global patterns, the South African construction industry is a major contributor to the country's Gross Domestic Product and employment. The South African construction industry contribution to GDP was 5.1% in 2002; construction activities alone amounted to R45.4 billion (about US $7.5 billion) (cidb, 2013). The construction industry contributes about 35 percent to Gross Domestic Fixed Investment (GDFI); current projections of future infrastructure requirements indicate that its contribution to GDFI could double within 5 to 10 years (DPW, 1999; Rwelamila, 2002).

The structure of the construction industry in South Africa (to be discussed in more detail in the following section) makes it a labour-intensive economic sector. This is because the South African construction industry includes a high proportion of SMMEs and SMEs. As much as at 60% of the industry is micro, small and medium enterprises (CETA, 2004). SMEs tend to be more labour-intensive than large firms (cidb, 2013; Joubert *et al.*, 1999; SBP, 2006).Therefore, when SMEs have the opportunity to flourish, jobs are created, the economy grows and social equity is promoted (Agumba, 2006; Blaauw, 2006). A strong construction industry directly benefits national employment.

In addition to this, current realities in South Africa present opportunities for significant growth in the construction sector. The national housing shortage implies significant scope for future job creation in the construction industry (Joubert *et al.*, 1999). The construction industry provides the physical infrastructure which is fundamental to the country's development and its activities affect the lives of all South Africans (Rwelamila, 2002). The South African government recognises the construction industry as a national asset which needs to be developed and maintained (cidb, 2013).

2.2.3 Structure of the Construction Industry

In most developing countries, the distribution of construction contracting firms by size in is characterised by a pyramid structure which is overwhelmingly made of both small and large firms at the base of the pyramid (Hillebrandt, 1984; Ofori, 2009). Many of these firms are rather fragile and transient. They have low commitment to construction and perform poorly in physical output and service terms, giving the industry a bad name (Ofori, 2009). However, a good number of the SMEs have the potential to develop into bigger and technically better enterprises: they have dedicated leadership, are committed to delivering good service on their projects and strive for continuous performance improvement. These firms make up the difference between a strong base of the pyramid and a weak one (Ofori, 2009).

However, a good number of the SMEs have the potential to develop into bigger and technically better enterprises; they have dedicated leadership, committed to delivering good services on their projects and are therefore dedicated to have continuous performance improvement. These firms make up the difference between a strong base of the pyramid and a weak one (Ofori, 2009). The output of the construction industry also exhibits a similar pyramid structure but with a different orientation; a few large firms at the apex undertaking projects of higher financial value whilst the small firms undertake several projects with lower financial value at the base (Hillebrandt, 1984). The industry is also divided into formal and informal sectors wherein the formal sectors are the ones that strictly observe government regulations with regards to construction (Mlinga & Wells, 2002). However, a symbiotic relation exists between the two group of contractors with the formal or registered contractors being employers of the informal, with the informal being an important supplier of labour for the formal.

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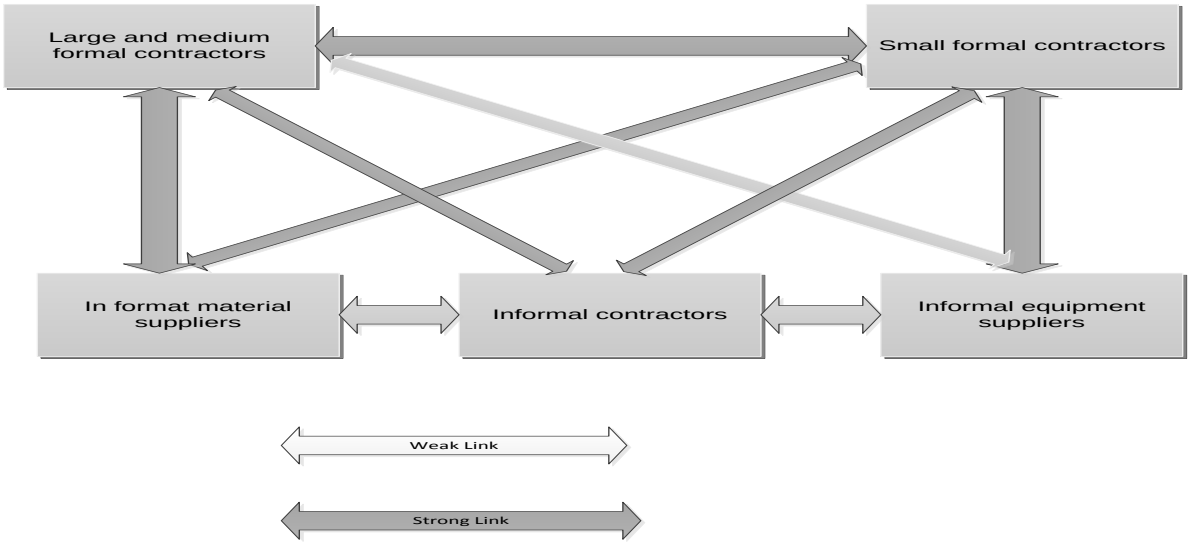
An economic linkage exists between the formal and informal class of contractors which produces a nation's physical infrastructure and other productive assets (Mlinga & Wells, 2002). In the backward linkage system, the informal sector acts as a link between the formal sector producers and the customers. On the other hand, the operational system of the forward linkage system produces goods to be used by the formal sectors. A schematic illustration of these relationships is shown in Figure 2.1.



Adapted from Mlinga & Wells (2002)

Figure 2.1: Schematic illustration of the economic linkages between formal and informal type contractors

2.2.4 Structure of the South African Construction Industry

Table 2.1 presents the categories of construction companies by economic sector. The table indicates that grades 2-4 construction companies are small construction companies whose maximum contract values are not more than four million Rand (R4m). Their management skill ranges from very poor to fair. They are both informal and formal construction companies. The table also indicates that Grades 5-6 construction companies are regarded as medium construction companies whose maximum contract value is thirteen million Rand (R13m) and their management skill level ranges between good and very good. Grades 7-8 are regarded as large construction companies with a maximum

contract value of one hundred and thirty million Rand (R130m). Grade 9 construction companies are also regarded as large firms and do not have contract value limits. They can undertake any construction projects.

Table 2.1: Categories of construction companies by economic sector

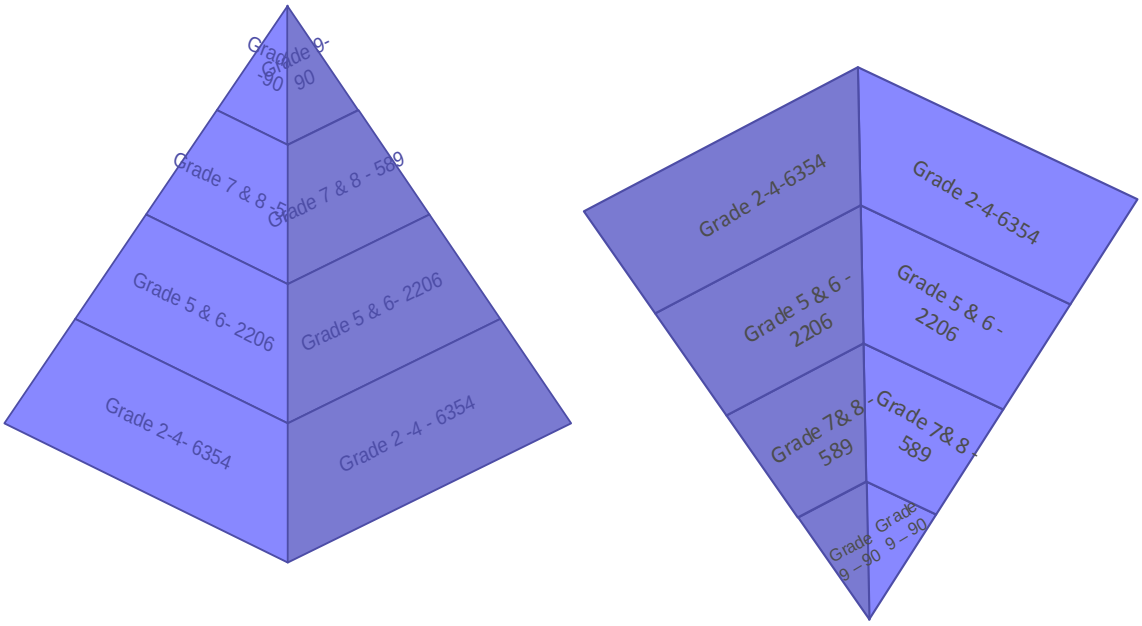
Cidb Grade	Category	Economic Sector	Maximum Contract Value considered of handling	Management Skills level
2-4	Small	Formal/informal	Less than R650,000 - R4M	Very Poor & Fair
5-6	Medium	Formal/informal	R6.5M- R13M	Poor, Fair, Good & Very good
7-8	Large	Formal	Above R40M-R130M	Fair, Good & Very Good
9	Large	Formal	No Limit	Good and Very Good

Source: Dlungwana *et al.* (2002) and cidb (2012a)

Table 2.2 and Figure 2.2 present the structure of the South African construction industry in terms of distribution of number of contracts by grade and public sector award by value.

Table 2.2: Distribution of number of contractors by grade and public sector awards and by value

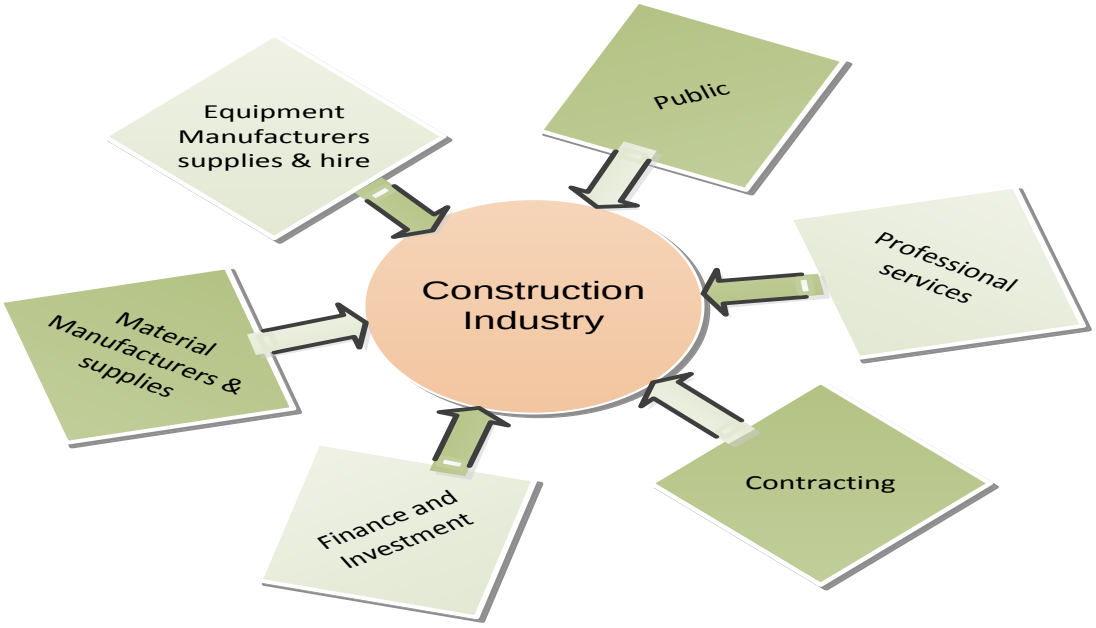
	No. of contractors on the cidb register				Public sector awards by value	
Grade	**General Building**	**Civil Engineering**	**Total No of Contractors**	**Percentage**	**General Building**	**Civil Engineering**
9	40	50	90	1%	32%	52%
7&8	279	310	589	6.4%	52%	36%
5&6	1033	1173	2206	23.8%	12%	9%
2-4	3501	2853	6354	68.8%	5%	4%
Total	**4853**	**4386**	**9239**	**100%**	**100%**	**100%**



Source: Windapo & Cattell (2011)

Figure 2.2: Distribution of number of contractors by grade and public sector awards and by value

The construction industry also has complex operational sectors as delivery chains which involve multiple participants operating from different areas within and outside the industry (Windapo & Cattell, 2011). These delivery chains include the professional services sector; contracting sector; public sector; finance and investment sector; material manufacturing and supply sector; and equipment manufacturers, supply and hire sector. Figure 2.3 shows the diagrammatic representation of sectors of the delivery chain in the construction industry. This study, however, focuses on the contracting sector which comprises the building and civil engineering construction companies in South Africa.



Source: Windapo & Cattell (2011)

Figure 2.3: Sectors in the construction industry

2.3 The South African Construction Industry Development Board (cidb) grading criteria

Contractor grading is generally described as the investigating, qualification and grouping of construction contractors based on their skills capability, integrity and responsibility and as a measure of contractors' abilities. It therefore eliminates incapable, underfinanced and inexperienced contractors (Agumba, 2006; Blaauw, 2006; Bubshait & Al-Gobali, 1996).

The cidb in South Africa grades contractors based on their financial capability and works capability. Financial capability refers to the a contractor's financial history (turnover) and the amount of working capital or available capital that the contractor can either use to secure a contract or support a contract (Manana *et al.*, 2012) (available capital refers to the liquid cash resources available to the contractor, which includes loans as well as any financial sponsorship.) Works capability is a measure of the largest contract undertaken and completed in the contractor's registered class of construction works, number of employees employed by the contractor, as well as the contractor's fulfilment of relevant statutory requirements (cidb, 2008a, 2008b; Manana *et al.*, 2012). The cidb grading ranges from grade 1 to grade 9. Contractors are required to register for the class of works they are capable of undertaking on a construction project (cidb, 2008a; Manana *et al.*, 2012).

2.4 Overview of Contractor Development Programme in South Africa

The Contractor Development Programme refers to a process which identifies and provides solutions to the constraints that affect the development and performance of construction companies generally (cidb, 2011). These constraints include contractors' lack of knowledge, low competitiveness and poor technical and managerial skills (Dlungwana & Rwelamila, 2004). Since 1995 the South African government has initiated a number of Contractor Development Programmes (CDPs) to encourage a wider participation of smaller firms in the construction economy. CDPs play a very important role in supporting the development of the construction industry and the development of emerging and established contractors (cidb, 2011). Currently there are more than 18 CDPs of various forms in South Africa, with more than 1300 contracting enterprises currently participating in these programmes. However, CDPs potentially play a major role, but in reality they are not effective. Contractor development programmes are established to achieve a number of aims. These include the

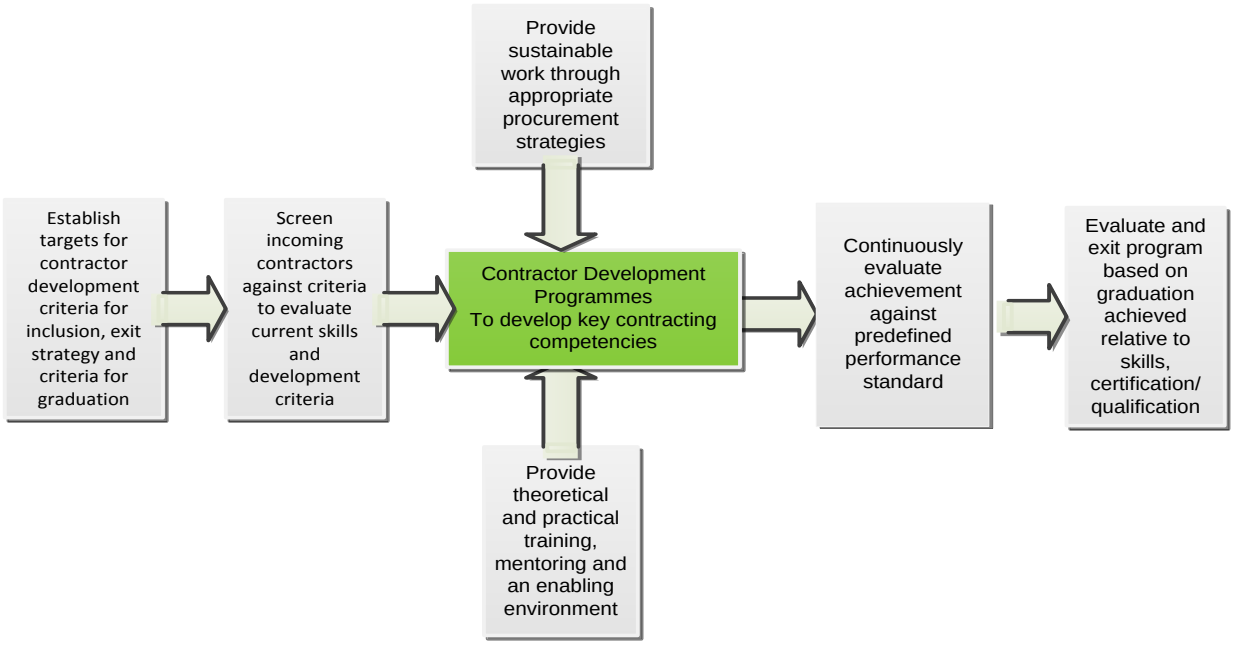
improvement of contractor performance in a particular region/environment; improving the capacity of local contractors to compete with foreign or international or established contractors; developing lower level construction firms and providing opportunities for them; and promoting the effective use of labour intensive methods by construction firms (cidb, 2011).

In South Africa, the National Contractor Development Programme is geared towards developing skills for small contractors as well as enterprise development and performance improvement for more established contractors. These developments are achieved both through access to work opportunities and through improved construction business environments which include payment cycles, training and advisory services. The CDP also promotes technological transfer and the use of technology; facilitates networking, joint venture and subcontract opportunities; and unbundles large contracts by adopting appropriate procurement (cidb, 2011).

Employing sufficiently qualified staff to run the programmes has been a challenge. Procedures for selecting new entrants into the programmes have sometimes been inappropriate due to lack of sufficient basic skills/skills development. Contractors exiting the programme have faced a lack of work opportunities and lack of access to finance, both of which have undermined the impact of their participation in the programme. Most contractor development programmes also fail to implement basic monitoring and evaluation processes for tracking contractors' progress after exiting the programme.

Overall, contractor development programmes in South Africa have not been as successful in contractor development as the cidb has hoped they would be (cidb, 2011). The significance of these programmes therefore necessitated the selection of most of the contractors from them to take part in the study. This was to get first-hand information from them about their perception of the operational variables that has a great impact on their performance in South Africa. Figure 2.4 is a contractor development model adapted from the NCDP brochure (cidb, 2011). The model shows that contractor development programmes has established targets criteria that allows the inclusion and exit of participating contractors. It also reveals that theoretical and practical training is available as well as job availability to exiting contractors. It further provides continuous monitoring and evaluation of contractors against predefined performance standards. This facilitates the graduation and subsequent

exiting of contractors that have achieved basic skills development from the programme. In this dissertation the focus on contractor development is only on the development of the contracting enterprise as opposed to the development of the work force.

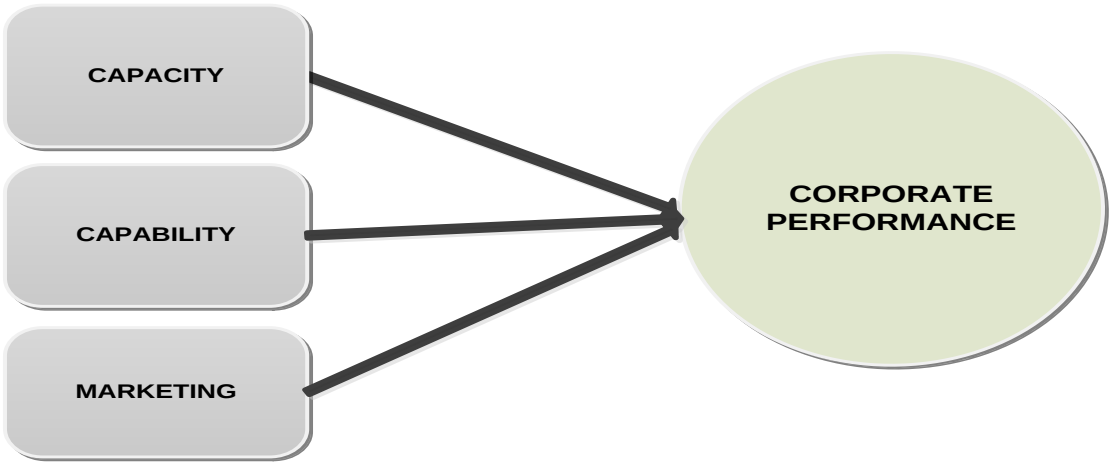


Source: cidb (2011)

Figure 2.4: Model for contractor development programme adopted from brochure

2.5 Review of the study variables

According to Rush *et al.* (2007), operational variables are key abilities of firms in using their technological competence to gain strategic competitive advantage. Operational variables that are examined in this research are the *capacity*, *capability* and *marketing strategy* of construction companies that impact on their corporate financial performance. Figure 2.5 indicates the operational variables used in the study.



Adapted from: Armstrong (2006); Ibrahim, Price & Dainty (2006); O'Donnell (2004); Rush *et al.* (2007); Zahra & George (2002)

Figure 2.5: Operational variables of the study

2.5.1 Capacity of construction firms

Capacity is described as the acquisition and understanding of new knowledge that can be transformed and used in implementation processes (innovation) (Cohen & Levinthal, 1990; Zahra & George, 2002). It is also referred to as having adequate human resource team; i.e. good employees/workers with technical expertise (Russell, 1991), an adequate level of managerial skills (Hillebrandt & Cannon, 1990) and the ability to recognise the value of technological innovation and apply it to gain competitive advantage (technical ability) (Cohen & Levinthal, 1990). Abu Bakar (1993), however, describes capacity as having financial capital. (Abu Bakar, Razak, Yusof & Karim, 2011), referred to it as a measure for assessing the development and growth of firms whilst Rush *et al.* (2007) refer to it as an underlying knowledge and experience base of the firm that enhances technological capabilities. Armstrong (2006), described capacity from an operational point of view as a basic measure of performance. Capacity can therefore be said to include, ability to innovate, having adequate human

resource (staff size), technical and managerial skills, technical ability and experience and financial capital.

2.5.1.1 Innovation

Innovation is described as the organizational, financial, marketing and technological capacity of a firm (Rush *et al.*, 2007). It is the ability of a firm to implement assimilated knowledge using proper management approaches in order to increase its efficiency and skills (Seaden, Guolla, Doutriaux & Nash, 2003). Innovation is an actual use of a non-trivial change and improvement in a process, product or system that is new and strange to the organization effecting the change (Slaughter, 2000). It is often viewed as creating successful ideas and executing them within an organization (Amabile, Conti, Coon, Lazenby & Herron, 1996). Conventionally, innovation is defined as a process of commercialization of a newly developed or adopted product or practice (Freeman, 1982). Damanpour, Szabat & Evan (1989) and Damanpour & William (1984), categorize innovation into two types: administrative and technical. They describe administrative innovation as the effect of social systems of the organization whilst technical innovations set out to improve the technical capability of the organization. Innovation is perceived to be a significant factor that enhances a firm's competitive advantage in the changing market (Porter, 1985; Sexton & Barrett, 2003; Swann, 1993).

Dickson & Hadjimanolis (1998) assert that the more innovative a firm is, the greater is its capacity, its employment growth and its profit margin. They further suggest that innovation has a positive and significant relationship with the corporate financial performance of firms and that firms with poor performance records tend to have poor innovation records. Similarly, Eaton, Akbiyikli & Dickinson (2006) and Egbu (2004) have argued that the technological innovations of firms reduce costs and save time, thereby enhancing performance. According to Hitt, Hoskisson & Kim (1997) firms that invest more resources in innovative capabilities are likely to perform better in the long run.

Harty, Goodier, Soetanto, Austin, Dainty & Price (2007) proposes four requirements for innovation that firms should possess. These are: awareness; intense motivation; a surfeit of skills and competence; and infrastructure that supports construction firm innovation. Harty *et al.* (2007) notes that awareness has the greatest impact on construction firms' innovation. Unfortunately, South African construction firms seem to lack innovation when compared to firms in other economic

sectors (Van Wyk, 2007). While other sectors innovate, the construction industry still maintains its craft method of operation. This approach has been criticized for offering lower productivity, quality and hence value for money, than is achieved in other industries (Winch, 2003). The low levels of innovation by construction firms are mainly attributed to the manner in which construction projects are managed by contractors.

Sydow, Lindkvist & DeFillippi (2004) point out that construction firms focus entirely on the project at hand, leaving no room for other things that would cause problem for them in the future. This means that the project team risks becoming a knowledge silo, where the knowledge developed is not available for other members outside the team. Keegan & Turner (2002) support Sydow *et al.* (2004's) view that most contractors leave no room for reflecting and documenting experiences or lessons learned. It seems that few contractors document previous experiences acquired from projects and hence such knowledge is lost to future projects (Blayse & Manley, 2004).

Continuing this line of thought, Drejer & Vinding (2006) suggest that the use of post project reviews and systematic evaluation and diffusion of experiences may help to combine short–term task performance with long term learning and knowledge accumulation. According to Drejer & Vinding (2006), firms should prioritize the assimilation and use of new knowledge (often to be gained through strategic partnering with other firms), in order to enhance their innovative capacity. The value and influence of innovation on business organizations cannot be overstated. According to Damanpour *et al.* (1989), the introduction of technical innovation is of primary importance for organizational effectiveness. It seems clear that greater levels of innovation in the construction industry can be expected to translate into better growth and development within the industry and a stronger contribution to economic growth (Blayse & Manley, 2004).

2.5.1.2 Human resources (staff size)

A firm's size can be measured in terms of total number of employees, founders and contract workers in the firm (Bonaccorsi & Giannangeli, 2010). According to Stam, Garnsey & Heffernan (2006), a positive relationship exists between the size of firm and its growth. But the concept of human resources as an element of a firm's capacity goes beyond simply the number of employees in the company. Armstrong (2006) describes human resources as the effective effort that can be put to work

as shown by the number of people and hours of work available, the capacity of the employees to do the work as well as their productivity. Armstrong (2006) further points out that resource can be strengths or weaknesses of a firm. Just as physical resources (raw materials, equipment and financial capacity) can enhance or constrain productivity, so too can human resources (such as training, experience and skills).

Human resources are one of the most crucial elements of an organization's success (Cascio, Thacker & Blais, 1999). Higher levels of strategic and human resource planning have a significant impact on organizational performance, including higher productivity, greater cost effectiveness and greater overall efficiency (Ferris, Russ, Albanese & Martocchio, 1990). Gratton, Hailey, Stiles & Truss (1999) also posit that skills and motivation of people that serve to train, develop and retain enhances the organization's competitiveness. Some indicators for measuring human resource capacity include: appropriateness of organization structure; career prospects with the organization; ratio of technical to professional staff in the organization; availability of resources and programmes for training; and the appropriateness of the personnel structure (Tan, Shen, Yam & Low, 2007). Construction firms often fail to perform because of a lack of adequate human resources in terms of adequate technical skill workers and professional staff (Chan, Yung, Lam, Tam & Cheung, 2001; Morrison, Breen & Ali, 2003; Ogunlana, Promkuntong & Jearkjirm, 1996; Raftery, Pasadilla, Chiang, Hui & Tang, 1998; Wang, 2000).

2.5.1.3 Technical and management skills

Management skills reflect a contractor's ability to provide clients with high quality products or services (Tan *et al.*, 2007). They are described also as the ability of a firm to release the full potential of its employees through the transfer of knowledge across projects embedded in the capability to enhance continuous growth of firms (Dlungwana, 2000). Management skills include the effective management of quality and striving to improve all facets of the organization in order to meet the demands and expectations of the client (Delgado‐Hernandez & Aspinwall, 2005; McIntyre & Kirschenman, 2000). They also involve managing risks – in other words, identifying, monitoring and evaluating the activities or functions of the firm so as to minimize company loses and maximize company opportunities (Mbachu & Nkado, 2006).

Tam & Harris (1996), Yusuf (1995) and Wijewardena & De Zoysa (2005), assert that a good management team is a performance criterion for firm. Similarly, Abu Bakar (1993) suggests that the technical expertise of construction firms can enhance business performance. According to Thomas, Marosszeky, Karim, Davis & McGeorge (2002) and Ling, Low, Wang & Lim (2009) technical and management skills involve improving the quality of product or services offered in order to minimize resources and cost (including reworking), thereby increasing the profitability of construction. Wasi & Skitmore (2001) concluded that adequate managerial skills enable firms to acquire experience. Strischek (1998) argues that the most influential factor for a construction firm's performance is the level and strength of its management skill, procedures and practices. Flahvin (1985) and Gaskill, Van Auken & Manning (1993) posit that business failure due to non- performance of firms is a function of lack of management skill and experience. Bubshait & Almohawis (1994) and Chan & Chan (2004) also note that technical and management system involve the degree to which construction projects are managed without major accidents occurring which reduces time and cost and hence increases profitability of the firm.

Hillebrandt (2000) cited in Myers (2004) suggests that management expertise is one of the scarcest resources in the construction industry. This implies that, lack of managerial skills poses a significant constraint on small construction company development (Kayanula & Quartey, 2000; Ramokolo & Smallwood, 2008). Hillebrandt & Cannon (1990) identify management as the most significant factor that determines the capacity of construction companies, as well as their capability. They posit that construction is management intensive due to the day-to-day decisions required on site and within the organization. Thus that good management is one of the most significant factors of success for construction companies (Yusuf, 1995). Similarly, Green, Larsen & Kao (2008) argue that the key determinant of a construction company's capacity is the availability of managerial skills.

The delivering of a project on time (thereby avoiding contractual disputes) is a significant indicator in project success (Al-Khalil & Al-Ghafly, 1999; Swan & Khalfan, 2007). Delays in project execution often lead to claims or cost overrun, which hinder the performance of construction companies (Odeh & Battaineh, 2002). Research suggests that the ability to manage a project including unforeseen events and challenges without claims or contractual disputes is an integral part of management and a significant indicator of performance (Chan & Chan, 2004; Mbachu, 2008). The

technical management of safety is being regarded as an integral part in project management (Bubshait & Almohawis, 1994). Safety is the degree to which projects are executed and completed successfully without major accidents occurring (Bubshait & Almohawis, 1994). The implementation of a construction project therefore without major accidents occurring is a significant indicator of enterprise performance (Chan & Chan, 2004).

Good performance within a company is therefore to large extent the result of good business management (Houben, Lenie & Vanhoof, 1999). Site progress management, quality management, safety management, risk management and performance during the warranty period are all indicators of measuring technical and management skills of construction companies (Tan *et al.*, 2007). Good management skills and practices will lead to the delivery of quality projects safely, on time, without claims or contractual disputes. Conversely, poor management often results in delays and cost overruns, which translate into poor performance of the contractor (Baloyi & Bekker, 2010; Flyvbjerg, Bruzelius & Rothengatter, 2003; Toor & Ogunlana, 2008).

The foregoing suggests that technical and management skills entail:

- Availability of quality management system within an organization
- Safety (avoidance of major accidents occurring)
- Working within the stipulated project cost (avoidance of budget cost overrun)
- No contract disputes
- Delivering of project on time
- Availability of risk management system
- Availability of competence of contract manager
- Effectiveness of site management
- Performance during the warranty period

2.5.1.4 Technical ability of construction firms

Hatush & Skitmore (1997) describe technical ability / capacity as the effective use and possession of assets (plant and equipment) that impact on performance. Assets are generally defined as any

property including resources in the form of buildings/engineering works or components created by capital expenditure (Calvert, Bailey & Coles, 2003). “Fixed Assets” (FA) are those assests that are relatively permanent, in that they are not held for sale or for conversion into cash but are retained as an instrument of production, or in order to earn revenue. Some examples of FAs are land, buildings and machinery (Calvert *et al.*, 2003). Assets made or acquired for sale and conversion into cash, or assets in the form of cash in hand or money at the bank, are known as “Current Assets” (CA).

Tam & Harris (1996) argue that equipment, as a contributor to technical ability, is a performance criterion for contracting businesses. However, Teece, Pisano & Shuen (1997) hold the view that plant and equipment can be easily bought by any firm and so does not improve its capacity or make it competitive. While equipment is clearly important for performance, it can be argued that knowledge and intellectual capital are just as important, if not more so (Lubit, 2001). The level of education and experience of the staff strongly affect technical capacity. Numerous studies have provided evidence linking the education and experience of staff directly to enterprise growth and performance (Abu Bakar *et al.*, 2011; Becchetti & Trovato, 2002; Bubshait & Al-Gobali, 1996; Lussier & Pfeifer, 2001; Robinson & Sexton, 1994).

Experience is described as the product of identification of relevant skills or information (Fahey, 1999), the interaction with customers (Nonaka & Takeuchi, 1995) and a means of learning by doing (Levitt & March, 1988; Rosenberg & Czepiel, 1984). It is also referred to as organizational memory (Walsh & Ungson, 1991) and a display of a firm’s knowledge (Herriot, Levinthal & March, 1985). Nelson & Winter (1982) refer to it as the acquisition and assimilation of new knowledge for future technological search which enables the firm to develop new routines. The level of experience of a firm is directly related to how long it has been in existence. Business longevity implies greater accumulated experience; and this in turn would be expected to improve performance and the chance of the business surviving into the future. Supporting this idea, studies have indeed found that the size and age of business organizations have a positive relationship with survival rates (Malinen, 2001). Fahey (1999) reports that corporate longevity has a positive relationship with corporate performance, whilst Becchetti & Trovato (2002) acknowledge that firm growth is positively and significantly related to both size and age or experience. One could therefore argue that a company’s competitive advantage is embedded in its knowledge (Grant, 1996). Bell (2003) and Rush *et al.* (2007) state that

the acquisition and development of technological knowledge enhances the competitive advantage of firms.

Cooper & Gascon (1992) on the other hand alluded that the relationship between the age of an organisation and its corporate performance is not definite but varies. Brockhaus & Horwitz (1986), Cooper, Dunkelberg & Woo (1988), Begley & Boyd (1985) and Cragg & King (1988), echoed similar sentiment that organizations can perform either more or less due to its long time existence. The views of Cooper & Gascon (1992) are in the minority because most scholars are of the view that the age of any organisation impacts greatly on their performance. This means that the evidence favour the other side.

According to Tan *et al.* (2007), indicators for measuring technical ability of construction firms constitute

- Possession of plant and equipment by firms
- Utilization and efficiency of plant and equipment.
- Maintenance of plant and equipment
- Rate of new technology developed internally.
- Number of technical staff
- Experience knowledge of technical skills
- Qualification of technical staff and
- Adequacy of administrative staff

2.5.1.5 Financial capital

Finance is defined as the amount by which the firm's readily convertible liquid or current asset exceeds the firm's current liabilities. In other words, this is the working capital of the company (including the company's cash, investment bills receivable, stock, book debts and similar floating assets) minus trade creditors, bank overdraft, bills payable and similar floating liabilities (Armstrong, 2006). Finance in this report is primarily concerned with how an organization deals with financial resources in order to maximize profit over the long term.

Financial availability and adequate cash flow of firms enhances performance (Abu Bakar, 1993; Hillebrandt & Cannon, 1990). Conversely, a lack of finance can severely hampers a business venture. Far more companies go out of business because they are not solvent than fail because they are not profitable; i.e. solvency is just as important as profitability (Calvert *et al.*, 2003). Insolvency may be a particular problem for smaller, lower-level building contractors. Lack of access to finance by SME construction companies -- both during pre-construction and performance bond requirements and during the implementation of the construction works itself creates serious cash flow problems, which can severely undermine performance (Adams, 1997; Kayanula & Quartey, 2000; Thwala & Mvubu, 2008).

Previous studies done by researchers like Tan *et al.* (2007) indicate that financial capacity comprises:

- Value of annual loans acquired by the organization
- Knowledge about financial policy
- Effective communication with bankers and financial institutions
- Organizational asset status
- Organizational profit status
- Growth rate of organization's profit status
- Capability of loan repayment
- Payment to sub-contractors and
- Value of annual contracts

This section has considered capacity as a basic requirement for the success of a firm. Smyth (2010), however, points out that capacity alone cannot guarantee a firm's continuous growth or development. Other variables are important too. A second, crucial factor is capability.

2.5.2 Capability of construction firms

Grant (1991), described capability as the capacity for a team of resources to perform some task or activity or the ability to make use of some resources to perform some task or activity. Resources could be defined as anything "tangible" or "intangible" owned or hired by a firm to perform work or

anything that aids a production process (Grant, 1991). Capability is also referred to as something that a firm does rather than it possesses (Antonacopoulou *et al.*, 2005; Zollo & Winter, 2002). Eisenhardt & Martin (2000) refer to it as a tool which firms uses to improve their operations. De Haan *et al.* (2002) take a different approach. They describe capability not as resources, but as the reorganisation of the operating routines of a firm in response to change of environment to gain competitive advantage.

Organizational capability represents managers' proficiency in understanding principles and applying processes consistent with principles, in order to manage people for competitive advantage. In other words, capability is about knowing how to do things, rather than about having privileged access to resources and markets (Zahra & George, 2002; Zott, 2003). Smyth (2010) and Thwala & Mvubu (2008), argue that technical capability alone does not sufficiently enhance a firm's continuous growth or development. Eisenhardt & Martin (2000) suggest that capability is a tool which firms use to improve their operations. Bell (2003) alluded that capability is the development of technological knowledge acquired from minimum to high level of competence that would enhance performance in a competitive environment. According to Jarzabkowski (2005), a construction firm's success through capability is not a guarantee for future success.

However, Zott (2003) and Zahra & George (2002) were of the view that there is a relationship between capability and performance whilst Teece & Pisano (1994), Teece *et al.* (1997), Zollo & Winter (2002) concluded that firms are more successful than others due to better capabilities. Capability can, therefore, be categorized as being the acquisition and development of technological knowledge (coaching/mentoring) and reorganisation of operating routines (organisational structure).

2.5.2.1 Acquisition and development of technological knowledge (coaching/mentoring).

Coaching is primarily described as skills and knowledge acquisition that capacitates individuals and organizations to grow and develop (Hackman & Wageman, 2005). It is a form of active learning that communicates relationship skills that integrate personal development and organizational needs (Sherman & Freas, 2004). Mentoring is the improvement of the performance of an individual in terms of skill acquisition and can be over a long term (Coutu & Kauffman, 2009).

Coaching is primarily a performance improvement, typically over a short term in specific skills area (Coutu & Kauffman, 2009). Coaching is also referred to as the improvement of the behaviour within an employee so as to enhance performance in the employee and the company in terms of delivering of the product of the company (Chidiac, 2006; Coutu & Kauffman, 2009; Perry, 2006), increases productivity in employees (Brumwell & Reynolds, 2006) and enhances sustainable commitment and momentum at the work place (Broad, 2006).

According to Muir (2009), McGuffin & Obonyo (2010) and Brumwell & Reynolds (2006), coaching enhances productivity and performance of firms through motivation of its employees during economic crisis. Continuous growth of firms depends on the management of its human resource in overcoming their deficiencies through coaching methods. Coutu & Kauffman (2009) opine that coaching is a long time process which enables an employee's ability to enhance company's performance. Chidiac (2006) however stated that coaching enhances performance of employees through improved skills. Schneider, Dowling & Raghuram (2007) opine that employee development enhances organizational performance and high growth. The ability of a firm to train and coach its personnel therefore underpins organizational capability (Garvin, 1993; Leonard-Barton, 1992; Stata, 1989). From the foregoing, it can be concluded that construction companies can successfully use coaching techniques at all levels in an organization to improve and motivate their employees' productivity and performance at work which will in turn influence the firm's overall performance (McGuffin & Obonyo, 2010). However, an extensive literature search indicates that there is need to validate the efficacy of coaching techniques through empirical research within the construction industry (McGuffin & Obonyo, 2010).

2.5.2.2 Organisational structure

Calvert *et al.* (2003) described organizational structure as one that comprises the existence of certain relationships between individuals that are part of an integrated plan for the effective working of the management machine. It is a tool that enables the fulfilment of the cooperative tasks of delegation of authority and allocation of responsibility. It indicates management commitment for the discharging of various functions such as quality control and safety by organizations (Bubshait & Al-Gobali, 1996). The degree of hierarchy and level of vertical integration be it formal and informal structure of

any organizations impacts greatly on their corporate performance as well as the rate of innovation, capabilities and competencies of the firm (Argyres, 1995; Teece, 1996).

2.5.3 Marketing Strategy

Marketing is described as the identification of the needs of consumers and then estimating effective demand and matching it with a supply of services (Kotler & Armstrong, 1991). It is the function of management which deals with the organization and direction of the activities of the company in terms of converting the purchasing power of the customers into effective demand for a specific product or service so as to enhance profitability (Harris & McCaffer, 1999). Marketing Strategy is defined as a holistic plan that encapsulates an organisations goals, policies and actions that brings about competitive advantage of the organization which denotes a function of its resources to its rivals (Cook, 1985; Korkmaz & Messner, 2008). It can be referred to as the direction and scope of an organisation over the long term which matches its resources to its changing environment, particularly market, customers or clients so as to meet stakeholder expectations (Johnson & Scholes, 1993; Panibratov, 2008).

Panibratov (2008) describe marketing strategy as a basic long-term goal and objective of an enterprise (mission and vision) and the adoption of courses of action and the allocation of resources for carrying out these goals. According to Cattell (1993), the ability of an individual to market themselves, as well as their firm, is one of the common factors of business success. Cook (1985) defines marketing strategy as putting company's resources at risk in the search of differential advantage. Arditi & Davis (1988) describe the function of marketing in a construction firm in a wider manner. According to them, marketing in construction firms is the exploring of new markets, evaluating job potential, establishing relationships with potential clients; gaining information regarding market conditions, potential customers and projects; and prequalifying with clients. Shearer (1990) asserts that marketing in most construction firms is neglected because of the one-off nature of the construction product and because the product does not exist in the first place.

A study by Yisa, Ndekugri & Ambrose (1995) revealed that a small amount of time and money is spent on the marketing strategy in firms. However, Yisa, Ndekugri & Ambrose (1996) note that the basic marketing strategy for a firm is its relationship with its past clients and claims that most repeat

business comes from satisfied clients. It is important therefore to note that client satisfaction brings about repeat business. Wijewardena & De Zoysa (2005) also identify marketing strategy as a key business performance factor. Marketing can, therefore, be said to include; business objectives, mission and vision of an organization, networking, geographical spread and business diversification.

2.5.3.1 Business Objectives and Goals

Business objective and goal, as described by Stumpf & Mullen (1991), are the detailed fundamental things that are expected to be accomplished within the early days of an organization's inception. Objective and goals are often shorter for established businesses and longer for new ones (Stumpf & Mullen, 1991). Dlungwana (2000) notes that good business objectives lead to positive results and performance when the needs and expectations of clients/customers and other stake holders are satisfied. Objectives and goals often serve to draw the attention of managers to those aspects of the business that are considered most important and to ensure that they are being carried out successfully. In other words they serve as bench marks in running a business (Stumpf & Mullen, 1991).

2.5.3.2 Mission and Vision of an Organization (Company Mission Statement)

A mission statement is described as the statement of an organisation's reason for being and the purpose that distinguish it from another similar organization (David & David, 2003), a statement that addresses the following questions: "why do we exist", "what is our purpose", "what are we trying to accomplish?" which captures an organisation's unique and enduring purpose (Bart & Baetz, 1998). It is a promoter of employees' expectations and communicates a public image of the firm to import stakeholders and groups in the company's operational environment (Germain & Cooper, 1990). A vision of a firm is described as the dream of a company or where it wants to be after several years of operation (Stumpf & Mullen, 1991).Vision statements are not like goals and objectives which are often written in financial terms. Vision cannot be measured but can be felt as improvement takes place in the life of the firm (Stumpf & Mullen, 1991).

Mission statements do not depict an organizations capability but have an intrinsic value of the organizations products/services (David & David, 2003; Simpson, 1994). Pearce & David (1987) note

however that mission statement is the function of competitive market, product and services, geographical spread of business, a firm's innovative strength, a firm's survival/growth and profit standing, a firm's values, beliefs and ethics, a firm's impact on its targeted communities, the significance of the overall staff of the firm and the competitive advantage of the firm.

According to Germain & Cooper (1990), mission statement promotes shared expectations amongst employees as well as communicates a public image to other stakeholders and groups in the firm's operational environment. On the other hand, Analoui (2000) suggested that a mission statement allows a firm to articulate a strong vision for the organization and communicate its vision to its entire staff. However, Bart & Baetz (1998), hold a different view from that of Analoui (2000), in which they claim that a good mission statement is a function of an agreement of purpose of a firm, positive feelings about the firm and direction, objectives and strategies of a firm, a focal point and advocates good working relationship between managers of a firm.

Even though extensive research has not been done in the area of mission statements of firms and their corporate performance, there is evidence to show that the mission statements of firms could have a positive impact on a firm's corporate performance. Empirical studies done by Pearce & David (1987), show that mission components such as organizational philosophy, self-concept and public image have a positive relationship with the corporate performance of firms. Bart & Baetz (1998) also noted that a positive correlation exists between intermediary mission variables and firms corporate performance. Although the various mission variables of firms have not been fully investigated, there is evidence to suggest that a positive correlation characterizes the relationship between the mission of firms and firm's corporate performance.

2.5.3.3 Networking

Networking traditionally is described as a cunning inception, sustainability of interpersonal connections for the purpose of commercial gain or an activity in which owners of construction firms build and manage personal relationships with particular individuals in their environment to gain market share (O'Donnell, 2004). It is the collaboration between a set of actors (Hoang & Antoncic, 2003), as well as a flow of information between them, that brings about possibilities of success and survival (Jack *et al.*, 2010). Traditionally, networking is described as a verb, which deals with the

initiation and sustenance of interpersonal connections for business gain (O'Donnell, 2004). A business relationship therefore can be defined as a process where two firms or other types of organisations form strong ties of social, economic and technical services overtime with the intent of lowering cost and increasing value in order to enhance their business performance (Ritter *et al.*, 2004).

Networking is increasingly recognized to be a critical factor for a firm's growth (Neergaard, Shaw & Carter, 2005) and it serves as a medium through which information flow and improves the possibilities of success and survival of construction companies (Jack *et al.*, 2010). O'Donnell (2004) described the strength of network in which construction companies engage that brings about their corporate performance as the frequent use of network relationship based on its level of maturity, degree of trust and the nature of past experience between the two parties. O'Donnell (2004) further assert that strong ties are generally network ties that are reliable whereas weak ties are regarded as passive or causal relationship between individuals with less input. Networking plays a significant role in the growth of construction companies, which add value to business activities and enhances competitive advantage (Gilmore *et al.*, 2006). It enables a firm to break through complicated markets, understand inter-organizational relationships and business relationships with key players in the network arena (Olkkonen, Tikkanen & Alajoutsijärvi, 2000). Networking also helps construction companies' survival in a dynamic climate with larger competitors.

Past research has shown that construction firms have both formal and informal network relationships with industry stakeholders in the construction industry (Ritter, 1999). Business networking/ relationships can be described as a collaboration of a firm with a strategic actor to form strong and extensive services that enhances the firm's performance (Chell & Baines, 2000). Various empirical studies have supported the notion that networking has a significant influence on firm performance. For example, Florin, Lubatkin & Schulze (2003) discovered that social networking provides a sustainable source of competitive advantage which enhances a firm's corporate performance.

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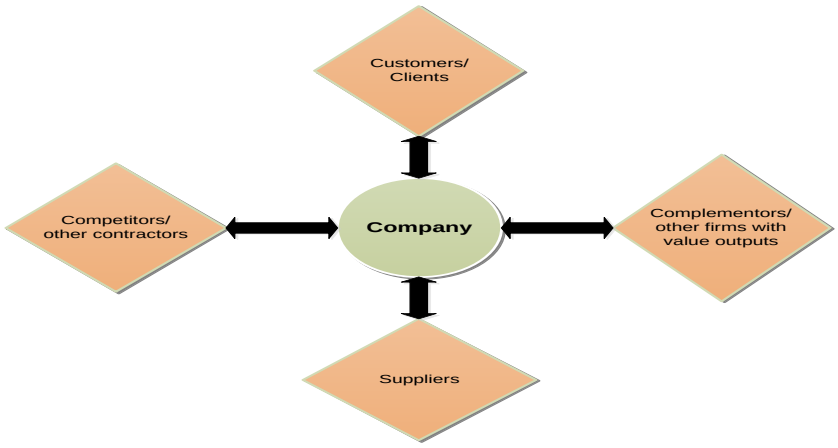
Kent (1994) found out also in his study that financial performance is positively related to firm performance through networking with external advisory services. Zhao & Aram (1995) in their report concluded that high growth rate of firms are always associated with greater range and intensity with business networking than low growth firms. Figure 2.6 is a model which shows that firms often network with clients, suppliers and other contractors to form strong and extensive social, economic service and technical ties over time with the intent of lowering total costs and/ or increasing value, thereby achieving mutual benefit (Anderson & Narus, 1991; Ritter *et al.*, 2004). Ritter *et al.* (2004) further asserts that firms established these relationships because it affects directly or indirectly their performance. For example, he posits that relationship with suppliers with strategically valuable product or services can be an important source of competitive advantage which would be difficult for other competitors to emulate or steal. Relationship with government agencies can be important also

by providing the means to enter new markets thereby increasing a firm's market share (Ritter *et al.*, 2004). This is also supported by O'Donnell (2004) who also claims that firms network with customers, competitors in home markets, potential suppliers, government agencies and clients/employers in order to get repeat business, increased market share and moreover enhances performance. This assertion is also supported by Tan *et al.* (2007) who held the view that good relationship with clients, architects, consultants, subcontractors and suppliers enhances work opportunities to contractors which will in turn give them adequate cash flow base that will influence their performance. This indicates that networking by construction firms is a significant indicator for exploring work opportunities by construction companies. Figure 2.6 shows firms' value network adapted from Ritter *et al.* (2004).



Adapted from: Ritter *et al.* (2004)

Figure 2.6: Firms' value network

2.5.3.4 Geographical Spread

Geographical spread is described as the ability of a firm to move from one place to another sometimes within the same geographical environment in a bid to extending its market share and ability to increase its turnover by extending its catchment area (Hillebrandt, 1979).

2.5.3.5 Diversification

Diversification of firms is being regarded by several authors from an international point of view in so many ways (Oyewobi, Windapo & Cattell, 2013). For instance, Capar & Kotabe (2003) define geographic diversification as a firm's expansion beyond the borders of its home country across different nations and geographical regions. Within the context of this treatise, diversification is defined as an organisational spread beyond its local borders to another market (sub-sector) within the industry or region (geographic) to improve business performance by reducing inherent risk and to enhance returns. The diversification under discussion here is not beyond internal borders of a firm's home country. This is premised on the earlier position of Ibrahim, Ibrahim & Kabir (2009) that geographic diversification refers to company's growth or expansion beyond its borders, which may be internal or external.

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Diversification is an entry of firms into new lines of activities, either by processes of internal business development or acquisition (Ramanujam & Varadarajan, 1989), or as a solution to major recession in general economic activity of firms due to unfavourable movements in demand conditions (Penrose, 1995). This is consistent with further assertions made by Penrose (1995) that the ability of an organization to go in search of products or services which will permit a fuller utilization

of their resources and reduce the fluctuations in their profits, creates an overall stability of earnings in the face of a generalized uncertainty.

Singh, Gaur & Schmid (2010) assert that the major motive for a company's diversification into different product categories and geographic markets is to satisfy its growth and corporate strategic objectives. Higgins and Vincze (1993), cited in Ofori & Chan (2000), note that the growth of firms requires some considerations. These were categorized into four namely: the type of growth (diversified); its geographical focus; how it will take place; and how quickly it will occur. Based on the classifications, it thus means that for a firm to achieve the desired growth, diversification of business is essential. The cidb (2012b)corroborates this by maintaining that a geographic spread and product diversification are necessary growth spurs within the South African construction industry.

Daniels & Bracker (1989), Haar (1989) and Kim, Hwang & Burgers (1993) noted that a positive relationship exists between international diversification and firm performance which is often measured by profitability ratios. Alternatively, Geringer, Beamish & Dacosta (1989), Kumar (1984), Morck & Yeung (1991) asserts that there is no positive linear relationship between international diversification and firm performance. Hoskisson & Hitt (1990) also argue that the relationship between diversification and performance is complicated.

However, previous research validated by economists predicted that innovative firms have the tendency to diversify in order to enhance profitability as well as increase knowledge acquired from diverse operations (Caves, 1982; Hitt *et al.*, 1997). Bettis & Hitt (1995) assert that diversified firms are more innovative and competitive. Even though empirical studies done by Oyewobi *et al.* (2013) shows that by product and service diversification of established firms impact corporate performance. However, most literature by other previous researchers have not clearly addressed how marketing in terms of diversification strategy enhances performance of the lower level construction firms. In short, most empirical studies either failed or overlooked the impact of diversification strategy on performance (Narasimhan & Kim, 2002). Even though there is not enough empirical evidence to show the impact of diversification on performance, it is, however, validated from previous research that diversification enhances economic benefits and that a non-linear relationship exists between product diversification and performance (Narasimhan & Kim, 2002).

The above discussions highlight the relevance of diversification on firm performance. It also shows how relevant diversification is to the South African construction industry where contractors operate in different provinces and diversify to different classes of works such as general building works, civil engineering, mechanical and electrical services, property developers, plant hirers. However, the study considers it necessary to highlight the impact of diversification on firm performance illustrated by previous studies as discussed above in order to appreciate the pertinence of this concept as it relates to the research and the South African construction industry in particular.

2.6 Performance

Performance is described as something accomplished (Performance, n.d.), the successful execution of a construction project based on an agreed budget and scope of works delivered (Hatush & Skitmore, 1997; Raisbeck, Duffield & Xu, 2010), financial, operational and organizational effectiveness (Ramanujam & Varadarajan, 1989) and the ability of an organization to possess technical capacity (Hatush & Skitmore, 1997). Sun (2000) describes performance as one that incorporates product quality, customer/client satisfaction, productivity and profitability, market position and competitiveness, employee satisfaction and environmental protection. Forsman (2005) expressed similar sentiment that performance is the ability of an enterprise to achieve its objectives in terms of customer satisfaction, market share, revenues and profit whilst Laitinen (2002) refers to it as an enterprise capability in satisfying its customers or clients.

Literature suggests that performance can be of two types; “Business” and “Organizational”. This study conceptualizes and defines business performance as how successful a company is over a certain period of time in relation to its goals and objectives. According to Otley (1999), business performance consist of two aspects; “financial” and non-financial performance. measurement in the past involves both objective and subjective means. This study however adopts the subjective means of measurement in investigating the performance of contractors which incorporates financial and non-financial performance criteria. Financial performance has been the dominant model in several empirical research which includes typical indicators as sales growth, profitability, cash flow and earnings per share capital (Panibratov, 2008) .

2.6.1 Measurement of Corporate Financial Performance

Many measurement of firm performance exists in literature. This is corroborated by Ibrahim *et al.* (2009) who maintained that several measures of firm's performance exist which are being demonstrated by researchers such as Ofori & Chan (2000). They opine that the index of performance measurement of firms includes sales revenue, volume of output, market share, profit, number of personnel, number of branches and the extent of geographical spread. Other studies on performance done by several researchers shows that measurement of performance ranges from return on total assets (ROTA) by authors such as Pandya & Roa (1998), Ibrahim *et al.* (2009) and Singh *et al.* (2010) and return on investment (ROI) by Hall & St. John (1994); Jiang, Zhihui & Chan (2005); Markides & Williamson (1994); Palich, Cardinal & Miller (2000).

This research therefore adopts Return on Total Assets (ROTA), Return on Capital Employed (ROCE), Profit Before Interest and Tax (PBIT), Profit Margin (PM) and Turnover of firms (TURNOVER) as measures of financial performance. This is consistent with the assertion of Norris (1990) who maintained that the main aim of any business is to yield profit which is associated with following measures of performance. These variables are defined as follows:

Return on total assets (ROTA, %). This is defined as the profit before taxes expressed as a percentage of total assets (TA). It is an indicator of both profitability and the growth of a firm.

Return on Capital Employed (ROCE, %). This is a measure of both profitability and growth as it measures how effective and efficient firm's management is in the business with respect to using its funds in growing the size of the business itself. This is the profit before tax shown as a percentage of the capital employed, where capital employed is taken to be the aggregate of the shareholders' funds, long term loans and long term liabilities. It is simply defined as the ratio of Profit Before Interest and Tax to Total Assets, less current liabilities.

Profit Margin (PM, %): Assertions made by Ibrahim *et al.* (2009) are that Profit Margin, which is also referred to as net profit on sales reflects the degree of competitiveness in the market, the ability to differentiate products, the economic situation and the ability to control expenses. Profit margin is defined as the profit before interest and tax expressed as a percentage of turnover. It is an indicator of

profitability and growth and provides a useful comparison for how well the costs have been controlled (Oyewobi *et al.*, 2013).

Turnover is the volume of construction contracts obtained by a construction firm over a certain period of time (Armstrong, 2006).

2.6.2 Variable

Variables/Criteria is described as standards used to measure the performance of contractors based on client and architects perception (Soetanto, Proverbs & Holt, 2001). It is a standard judgement or principle by which something is measured for value and a set of principles or standards by which favourable outcomes can be completed within a specified time (Chan & Chan, 2004). It can be referred to as something that enables a firm to understand its competitive position and potentially improves its performance (El-Mashaleh, O'Brien & London, 2001; Lai & Lam, 2010) as well as the acquisition of plant and equipment (Tam & Harris, 1996).

Performance indicators/variables include market share, product quality, marketing effectiveness and technological efficiency (productivity) (Panibratov, 2008), client satisfaction and profit (Alarcon & Ashley, 1992; Beatham, Anumba, Thorpe & Hedges, 2004). Scholars also believe that growth performance can be measured by dependent variable of turnover and number of permanent employees of the firm (Abu Bakar *et al.*, 2011). Watson (2012) had a different view about firm performance. He suggested that firm performance is a function of gender, education of the personnel, experience of the firm, the industry in which it operates, the age of the firm, number of staff or staff size and the ability of the firm to network. The performance variables however adopted by this research are profitability, client satisfaction, track records, job satisfaction, market share and turnover.

2.6.2.1 Profitability

Beatham *et al.* (2004) opine that profitability is a key performance indicator. Profitability is described as an increment on cost or financial gain (Norris, 1990), the basic goal for running a business (Naoum, 2003; Tam, 2002) and a function of timely delivery (Soetanto *et al.*, 2001).

2.6.2.2 Client satisfaction

Satisfaction is generally described as a person's feeling of pleasure or displeasure resulting from comparing a product or service's perceived performance or outcome in relation to his or her expectations (Mbachu & Nkado, 2006). Client satisfaction denotes an organisation's achievements concerning the satisfaction of its clients. It gives a clear indication of the client's opinion of the organisation's product and services and other additional measurements relating to the satisfaction of the organisation's clients (Ladzani, 2010). Previous studies have shown that measurement of satisfaction is of two fold; one is, an overall summary measure; whilst the other is by a combination of facets or attributes (Mbachu & Nkado, 2006). Kotler (2000) and Cheng, Proverbs, Oduoza & Fleming (2005) described client satisfaction as the satisfaction of an individual perception of pleasure or displeasure resulting from the performance outcome of a product delivery in relation to his or her expectations. It is said to be a sustainable client loyalty to the firm which enhances repeat purchase (Mbachu & Nkado, 2006), while Chan & Chan (2004) held the view that it is a significant indicator of performance rating in construction firms.

Assertions made by Hanson *et al.* (2003) state that poor client satisfaction due to conflict, poor workmanship and incompetent contractors negatively impacts a firm's performance. Reichheld & Sasser (1990), Rust & Zahorik (1993) and Anderson, Fornell & Lehmann (1994) empirically demonstrated that delivering high quality goods and services enhances client satisfaction which leads to profitability and a steady stream of cash flow. This view is being supported by Hudson, Smart & Bourne (2001), who opined that client satisfaction and human resources impacts on enterprise performance. Construction enterprises must ensure therefore that client satisfaction remains high in order to have higher competitive advantage. Rahman (2001) also expressed similar sentiment that client satisfaction is the major factor that impacts organisational corporate performance. However, Fornell (1992) and Griffin & Hauser (1993) assert that negative relationship exists between client satisfaction and market share.

2.6.2.3 Track record

Teece *et al.* (1997) argue that a firm's current capability is determined by its past record. Kaplan & Norton (1992) note that past performance does not reflect a contractor's present performance.

2.6.2.4 Job/Employee satisfaction

Job satisfaction simply refers to employee satisfaction in this dissertation. Job satisfaction is described as the level of satisfaction at which a person gains satisfaction in the work place (Fogarty, 1994). It relates to what employers achieve concerning the satisfaction of its employees. It is measured by people perception of the organisation and other additional measurements relating to the employee satisfaction which includes the measurement of the satisfaction of the employees themselves, as well as the views and perceptions of the employees about the operations of the organisation. Massey (2004) note that there is a positive correlation that impact on firm performance which is usually measured by quality and efficiency and key human resource practices. This human resource practices includes incentive pay, employee training and development, recruitment and selection, compensations, industrial relations and performance appraisals. Massey (2004) further asserts that human resource practices have positive and significant impact on low employee turnover, greater employee productivity and better overall firm performance. It is also known as a key factor in performance rating (Parker, 2000). Beatham *et al.* (2004) assert that a construction company's performance is highly related to job satisfaction.

2.6.2.5 Market share

Hillebrandt (1979) defines market share as the acquisition of jobs by firms within a certain geographical area. She further notes that, in order for a firm to substantially increase its turnover, the firm continuously sells itself through good and moderate pricing of its services and also extension of its catchment area. In addition, Hisatomi (1990) notes that increasing market share is important for construction firms' survival. Empirical studies done by Anderson *et al.* (1994), shows that market share and Return on Investment (ROI) is an economic performance measure. Gale (1972) asserts that an increase in a firm's share of market increases its ability to maximize profit and the bargaining power of the firm relative to its rivals in the same environment. He further opined that the ability of a firm to exploit markets profitably increases as firm size increases. Gale (1972), however, asserts that the effect of market share on a firm's profitability depends on industries and firm characteristics which include: the concentration in the industries in which the firm competes; the rate of growth in industry demand; and on the overall size of the firm.

2.6.2.6 Turnover

Turnover in this treatise is described as the volume of construction contract obtained by a construction firms over a certain period of time (Armstrong, 2006).

2.7 Summary of Literature Review

The literature review was done in the areas pertinent to the study. The review started with defining the boundaries of the construction industry, its role in other developing countries including South Africa, its contribution to employment as well as gross domestic fixed investment and gross domestic product, its holistic structure of the construction industry including the South African construction industry is highlighted. The literature search continues with the identification of the study variables as well as defining performance and its associated variables.

From the literature it can be seen that the construction industry, is a significant contributor to socio-economic development in every nation irrespective of the geographical difference between countries. The general structure of the construction industry is also the same when compared to the South African construction industry as seen in literature which indicates that the construction industry sector is homogenous in nature irrespective of the environment. This indicates that the construction industry is an asset which must be maintained and developed for economic growth.

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From the literature review, the research conceptualised the framework of the operational variables that impact the corporate performance of construction firms. The conceptual framework of the study is shown in Figure 2.7. The focus of the research, therefore, is identifying and establishing the significant operational variables of construction companies that impact on their performance such as

capacity, capability and marketing strategy, as conceptualised by the frame work. The literature indicates a steady stream of empirical evidences of the operational variables identified in the framework that impact on the corporate performance of firms. It also indicates specific/key operational variables that influence the performance of construction companies. The aim of the research is to identify and establish these specific operational variables of construction companies that impact on their performance. However, the research did not seek to investigate or establish the relationships between the operational variables and all the specific performance variables as well as the relationships between the performance variables and performance outcomes in the framework.

The measurement of performance of this study was done based on the financial measures of performance in terms of profitability and turnover. The relationship between the operational variables and the other performance variables as well as the relationship between the performance variables and their respective outcome will be the basis for future studies using a different approach.

Figure 2.7 shows the conceptual framework of the study. It indicates the relationship between the operational variables and performance. The performance variables are also indicated as being related to the performance. These relationships are aligned with studies done by previous researchers as highlighted in the literature review. The conceptual framework also shows the performance outcome of construction firms as being positive and negative. It indicates positive performance outcomes as being the continuous operation and progression on the cidb register of construction companies and negative outcome as failure and demotion of construction companies on the cidb grading register. The relationship between the performance variables and performance outcome was not studied as it is beyond the scope of this research and so will form the basis of future studies in this area.

2.8 Conceptual Framework of the study

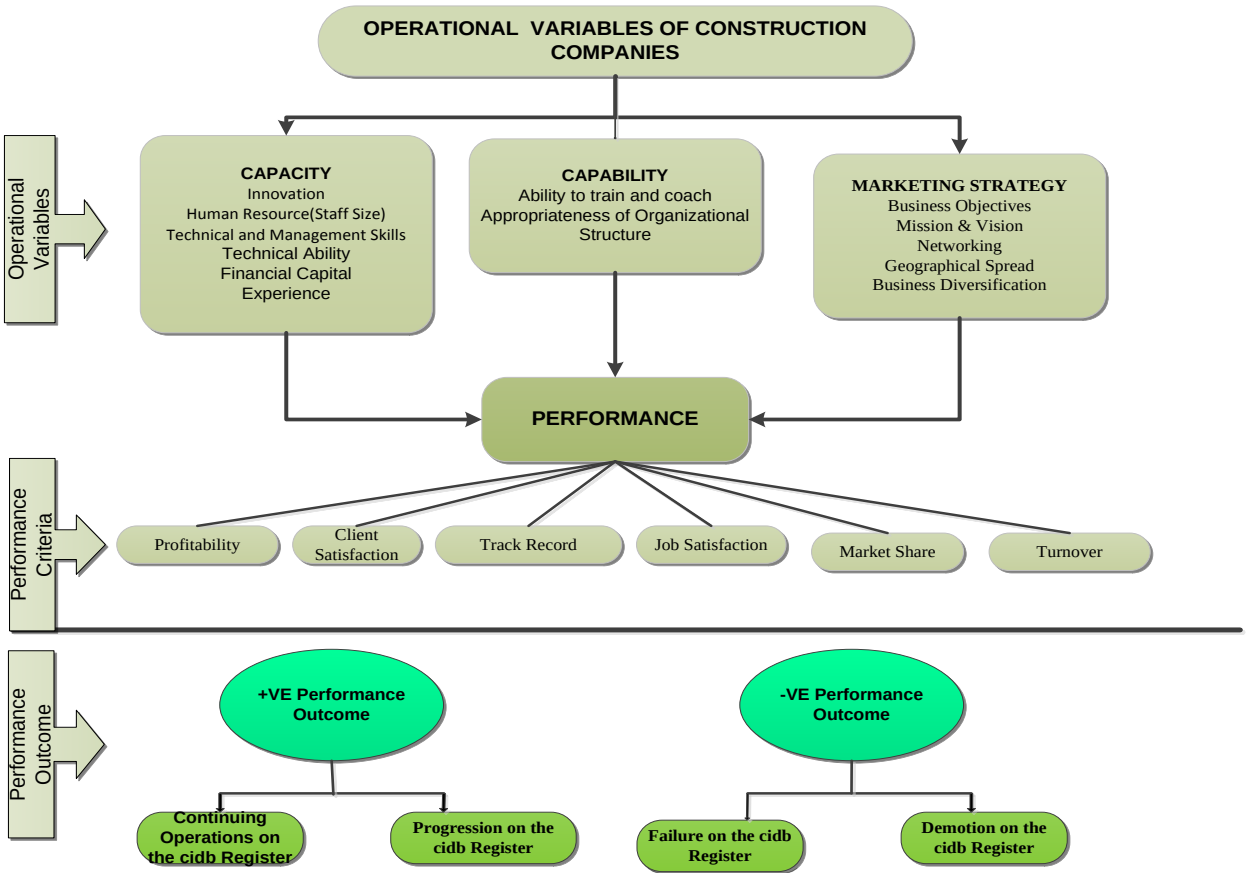


Figure 2.7: Conceptual framework of the study

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

Research methodology as described by Leedy & Ormrod (2005) is a systematic step in finding solutions to research questions. It is evident from the review of literature, that research is a systematic process that needs to be followed in order to get a valid and credible result (Blumberg, Cooper & Schindler, 2005; Gay & Airasian, 2003; Silverman, 2010). Figure 3.1 shows the methodical steps adopted by this research. Figure 3.1 is a framework of the research processes. It shows that the research started out by first identifying the focus of the research after which, an extensive literature search was done followed by the formulation of the research question. Quantitative research approach was employed in this study using questionnaire as the main data collection instrument by asking the respondents for their opinions on the identified variables in a well-structured way so that the research can generate hard facts and use statistics to guide in generalizing the findings. Hence, to obtain reliable statistical results, the study considers it essential to survey participants in fairly large numbers and ensure that they are a representative sample of target group. Subsequent analysis of the data was done using various statistical instruments and the conclusions and recommendations were drawn.

This chapter describes the research methodology adopted for the study. It also shows how the research was controlled and monitored in order to ensure the validity and reliability of the data. That chapter also outlines the data analysis procedures.

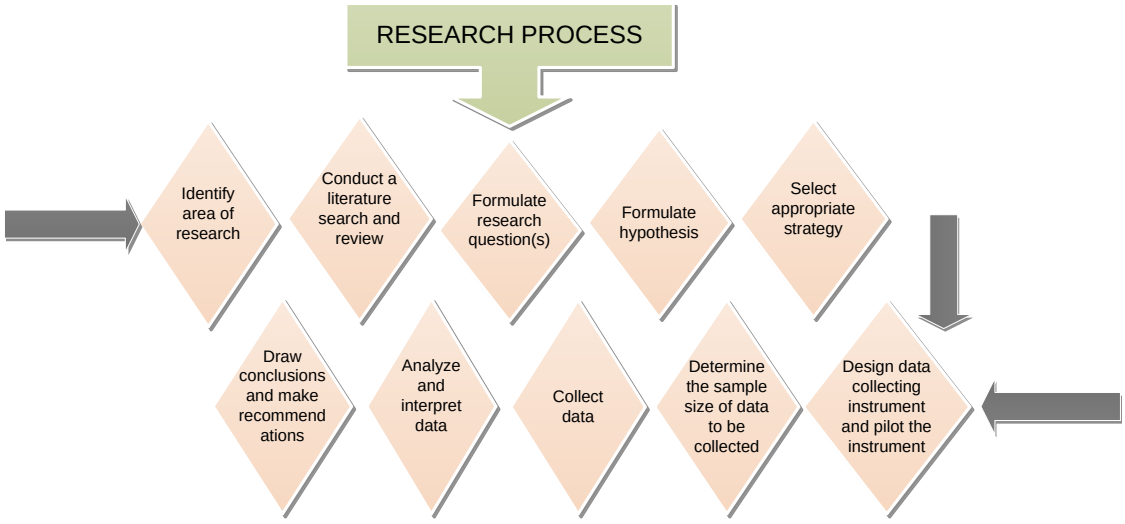


Figure 3.1: Research process

3.2 Research Paradigm

This research adopts a positivistic approach that is logical and deductive in nature. Positivism can be linked to objective thinking which searches for facts, conceived in terms of specified relationships and associations among variables (Gephart, 2004). The positivist framework focuses on quantitative methods to answer the research questions, test and verify the proposition. Eventually this leads to the collection and analysis of data aimed at proving (or disproving) the conceptual framework adopted by the study (Gephart, 2004). In the present research, the findings of the literature review were used to develop proposition that there are key operational variables that impact on the corporate financial performance of Small and Medium sized construction firms. The research is therefore set out to answer these research questions and test the proposition empirically.

3.3 Research Design

A research design is a blueprint which guides a researcher when undertaking a research project (Cooper & Schindler, 2006; Mouton, 2001). Research designs are usually primarily evaluative, comparative, descriptive, explanatory, or exploratory. Each of these designs is applied according to its suitability to a particular study. In this study a descriptive research design was used. The primary purpose of descriptive design is to provide clarification using words or numbers and to present a

profile, a classification of types, or an outline of steps to answer questions such as who, when, where and how (Neuman, 2006). This approach was the most appropriate for the aim of the study, which was to describe relationships between variables.

The study employs a quantitative approach in research design and data collection. Fellows & Lui (2003), describes quantitative methods as research that deals with numerical values and their occurrence, instead of on subjective meanings and experiences. The quantitative approaches used in this study relied upon the use of descriptive research in the form of questionnaires and historical data. Figure 3.2 below illustrates the research design. However, the research did not check for any response bias. In order to generalize the conclusions drawn from this research, caution has to be taken considering the limitations identified in the study and the findings due to the sample size and methodology.

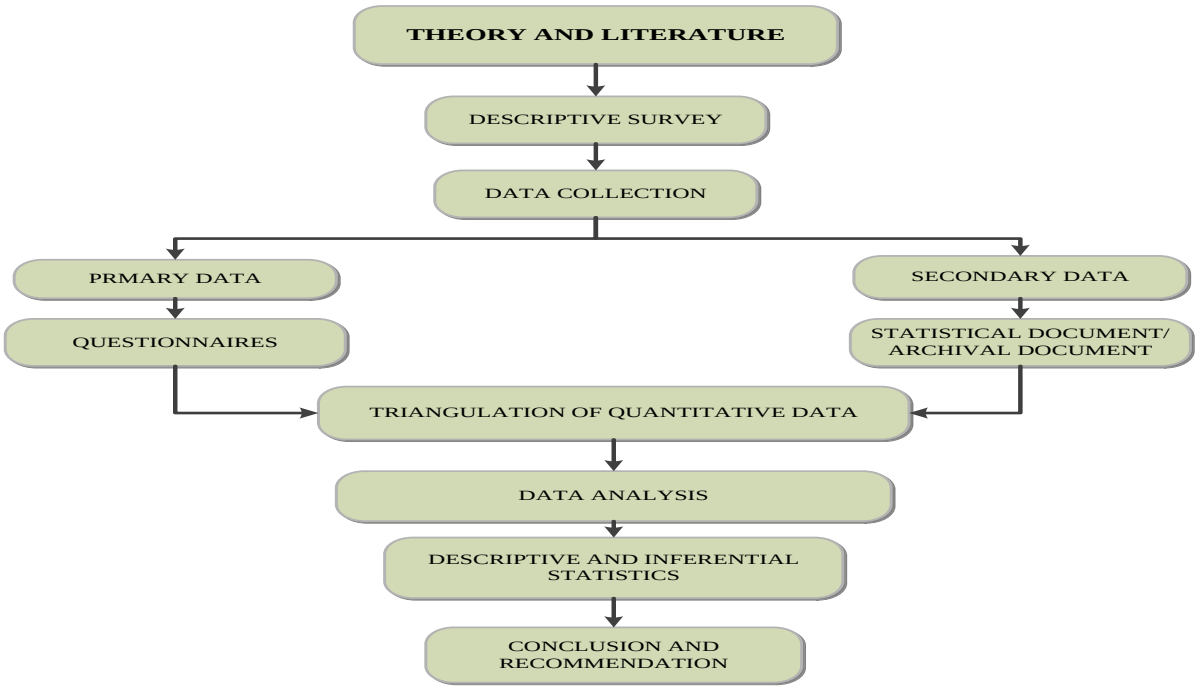
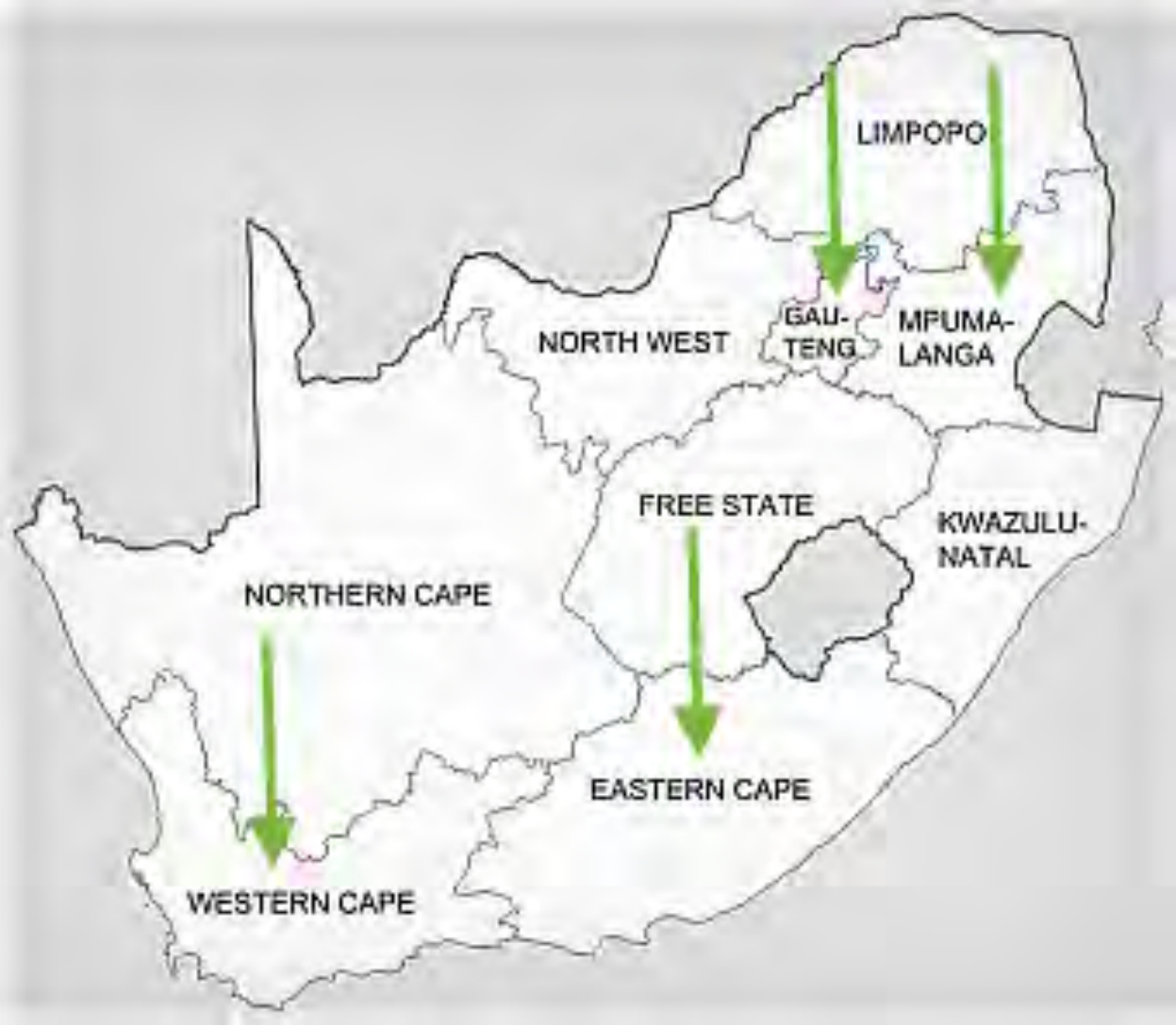


Figure 3.2: Research design

3.4 Geographical location of the study area

The study was focused on four provinces in South Africa: the Eastern Cape, the Western Cape, Mpumalanga and Gauteng. The main cities in these provinces are economic centres to which people move when they urbanize. These cities are concentrated economic centres where urbanization is occurring at unprecedented rates and as a result have many informal settlements (Ross, Bowen & Lincoln, 2010). Some of these cities also house contractor development programmes like the Siyanyuka contractor enhancement programme in the Western Cape, the Eastern Cape contractor incubator development programme (EC CIDP), the Sakh abakhi contractor development programme in Mpumalanga and the Gauteng Department of Public Works contractor development programme (cidb, 2011). In these areas the government has proposed housing projects aimed at eradicating the severe shortages of formal housing in South Africa. There are thus opportunities for contractor training and development on government housing projects in these areas. These geographical locations have both emerging contractor and enterprise development programmes that target grade 2-6 contractors who exhibit the potential to grow and develop (cidb, 2011). Figure 3.3 shows the map of South Africa indicating the study areas by the green drop arrows.



Source: The South African LED Network (2014)

Figure 3.3: Map of the Provinces of South Africa

3.5 Study Population

A study population refers to the entire group of items in which the researcher has an interest (Cooper and Schindler, 2006). The current research was geared towards determining the key operational

variables of small and medium construction companies that impact on their performance. Thus the study population was all small and medium construction companies in South Africa. A unit of analysis as described by Blumberg *et al.* (2005) is the level at which research is conducted and determines which objects are used. However, construction enterprises do not talk or write and hence cannot be interviewed or administered questionnaire to and therefore the representatives who are highly placed in the firms were the ones that responded on behalf of their organizations (Blumberg *et al.*, 2005).

3.6 Sampling methods

Sampling refers to the technique used to selecting members of a population to participate in a study. Sampling is necessary because it is almost impossible to examine the entire population. While random sampling is likely to produce the most representative sample, it was felt that for this study, a combination of purposive and convenience sampling was the most appropriate and practical method, for the following reasons. Firstly, in this study random sampling was not likely to guarantee the inclusion of active contractors on both the cidb register and contractor development programmes which were specified cases targeted (Asika, 2002; Teddlie & Yu, 2007). Secondly, and related to this, convenience sampling allowed the study to gather information that they would not normally have access to if they were implemented by probability sampling technique (Lærd Dissertation, 2013b; Marshall, 1996). In other words, convenience sampling takes into account the practicalities of what is feasible given the budgetary and time constraint of the research project. Thirdly, it was not considered essential that the results of this study be fully generalizable to the larger population. Bearing in mind the limitations of non-random sampling, the results would still be informative in highlighting key operational variables that impact on the financial performance of some firms. A combination of purposive and convenience sampling was thus judged to be appropriate for the study.

As described above, the study population was small and medium building contractors in South Africa. It was decided to choose a specific, more narrowly-defined sample from within this group which could feasibly be studied for the purposes of this research project. The sample for the study was defined as building and civil engineering contractors which met a set of three criteria. Firstly, the contractors had to be registered in grades 2 to 6 of the cidb register. These grades of contractors are

often used in contractor development programmes and form the major back bone of infrastructure delivery in South Africa (cidb, 2011). Due to the non-performance of these contractors, the study sought to identify and establish significant operational variables of these categories of construction companies that influence their corporate performance. Contractors with grading ranging from 7-9 were not considered because these grades of contractors are relatively large in size in terms of their capacity and are not often used in contractor development programmes. Moreover they play a secondary role in infrastructure delivery in South Africa (cidb, 2011). Secondly, the firms must have been active for at least the last five years because the focus of the study was looking at firms that have developed and gain some experience in the construction industry from the time of its inception. Thirdly, the firms had to be participating in a formal contractor development programme.

Some of these contractor development programmes have enterprise development that target grade 2-6 cidb grades of contractors who have the potential to grow and develop. Moreover, contractors in contractor development programmes are in the process of learning and developing their skills that may impact on their overall performance (cidb, 2011). Furthermore they may have different views about indicators that would impact their performance which is an indication that they might be highly interested in the survey in order to know the key operational variables that would impact on their performance. In addition, the register provides list of all contractors that undertake government projects in South Africa (cidb, 2012a). These grades also form the major contributors to infrastructure delivery (Ofori, 2000a). Tables 3.1 to 3.5 provide a breakdown of the sample that was targeted in the study. The tables show the total number of contractors that were listed in grades 2 to 6 on the cidb grading register and which were also active on the contractor development programmes in the four provinces as of 25th April 2013.

Table 3.1: Study population of grades 2-6 contractors targeted in the study area that are active on the contractor development programmes

Geographical Locations Grade	Mpumalanga (CE,GB,)	Gauteng (CE, GB,)	Eastern Cape (CE, GB)	Western Cape (CE,GB)
Two (2)	22	13	10	5
Three (3)	7	8	7	3
Four (4)	10	9	10	6
Five (5)	12	11	10	7
Six (6)	17	19	13	6
TOTAL	**68**	**60**	**50**	**27**

Source: cidb (2013)

Table 3.2: Composition of the study population based on work category and grades in the Mpumalanga Province active

Grade/Work category	2	3	4	5	6	Total
Civil Engineering (CE)	10	3	4	5	8	30
General Building Contractors (GB)	12	4	6	7	9	38
TOTAL	**22**	**7**	**10**	**12**	**17**	**68**

Source: cidb (2013)

Table 3.3: Composition of the study population based on work category and grades in the Gauteng Province

Grade/Work category	2	3	4	5	6	Total
Civil Engineering (CE)	3	4	4	3	7	21
General Building Contractors (GB)	10	4	5	8	12	39
TOTAL	**13**	**8**	**9**	**11**	**19**	**60**

Source: cidb (2013)

Table 3.4: Composition of the study population based on work category and grades in the Eastern Cape Province

Grade/Work category	2	3	4	5	6	Total
Civil Engineering (CE)	3	3	4	3	7	20
General Building Contractors (GB)	7	4	6	7	6	30
TOTAL	**10**	**7**	**10**	**10**	**13**	**50**

Source: cidb (2013)

Table 3.5: Composition of the study population based on work category and grades in the Western Cape Province

Grade/Work category	2	3	4	5	6	Total
Civil Engineering (CE)	2	1	3	3	2	11
General Building Contractors (GB)	3	2	3	4	4	16
TOTAL	**5**	**3**	**6**	**7**	**6**	**27**

Source: cidb (2013)

3.7 Sample Size

The two hundred and five (205) contractors included in Table 3.6 were targeted to take part in the study. Of these, only one hundred and eighty five (185) were accessible via emails and telephonically. Questionnaires were distributed to these. At the end of the study period, 62 valid responses were received. This represents a response rate of 30.2%, which is considered acceptable in construction management studies (Idrus & Newman, 2002; Wisniewski, 1994). Table 3.6 shows the number of questionnaires distributed and responses received from the four provinces.

Table 3.6: Number of questionnaires collected and responses

Respondents- Civil & Building	Province	Target Respondents	Questionnaire distributed	Number responded	% of total respondents
Grade 2-6 contractors	Mpumalanga	68	58	27	43.55
Grade 2-6 contractors	Gauteng	60	60	13	20.97
Grade 2-6 contractors	Eastern Cape	50	50	17	27.42
Grade 2-6 contractors	Western Cape	27	17	5	8.06
Totals		**205**	**185**	**62**	**33.51**

This research uses the responses received for data analyses.

3.8 Method of data collection

The data for this study comprises both primary and secondary data. The primary instrument used for collecting data was questionnaires administered to construction firms, as discussed above (Struwig & Stead, 2001). This is recommended in situations where achieving the research objectives demands the technique of operationalizing variables in terms of perceptions (Leedy, 1997; Saunders, Lewis &

Thornhill, 1997; Zikmund, 1997), typical in the production of statistical data which shows correlation between variables (Seymour, Crook & Rooke, 1997).

3.8.1 Primary Data - Formative research

Formative research was conducted with contractors in Mpumalanga Province. This was done to provide input into the design of the final questionnaire. The questionnaire needed to be clear and easily completed by busy executives; thus it was important to establish the time of filling in the questionnaire as well as its appropriateness. Ten contractors in senior management positions were interviewed. They were asked about their perceptions regarding the capacity, capability and marketing strategy that would impact on the corporate financial performance of construction enterprises generally (the questions are detailed in Appendix C). The respondents were assured of their anonymity should they take part in the study. Each respondent was also promised a copy of the report if interested.

3.8.1.1 Questionnaire Design

The design of the questionnaire was informed by the responses obtained the formative study. The list of the variables that form the core of research questions were obtained from the literature review. The draft questionnaire was also pre-tested in a pilot survey among personnel in senior management positions in ten construction companies prior to the study. The questionnaire consisted of two distinct parts. The first section of the questionnaire asked for information about the person completing the questionnaire and the construction firm for whom he/she worked at that time. The second section comprised corporate image questions that assessed the corporate performance of their firms with reference to the performance variables of the study. The length of the questionnaire was kept to a minimum and responses were given by ticking the desired option. Table 3.7 shows the layout of the questionnaire. A copy of the questionnaire used in the study is shown in Appendix D.

Table 3.7: Questionnaire design

Section No.	Section Name	Sub-problem addressed
A	General information	Work designation of respondents Work category of respondents Geographical spread of business Years of corporate existence
B	Corporate image of the respondents	
1	Capacity in terms of Technical Ability	Capacity of construction Equipment and Plant Utilization and efficiency of Equipment and Plant Number of Technical Staff Experience/knowledge of technical skill Qualification of technical staff
2	Capacity in terms of Financial Ability	Organizational Asset Status Organizational Profit Status Value of annual contract works (turnover)
3	Capacity in terms of Management Skills	Availability and effectiveness of quality management system Effectiveness of site management Effectiveness of financial management
4	Capacity in terms of Human Resource	Ratio of Technical and Professional Staff in the organization to number of site operatives Career prospect with the organization Appropriateness of personnel structure
5	Capability in terms of staff training	Availability of resources and programs for training your staff Appropriateness of Organizational structure in terms of your organizations operations
6	Marketing strategy in terms of stakeholders relationship	Relationship with Governmental Departments Relationship with Suppliers Relationship with Sub - Contractors Relationship with consultants Relationship with clients
7	Marketing strategy in terms of geographical spread of business	Local Provincial Regional National International
8	Abridged five year audited financial statements/annual reports	Profitability of the firm in terms of profit margin, return on total asset, return on capital employed and profit margin

Adapted from: Tan *et al.* (2007) and Lai & Lam (2010)

The semi-structured questionnaire comprised two sections, A and B. Section A was general information about the work category of the respondents, years of corporate existence of their company, work designation of respondents and geographical spread of the business. Section B sought information about the corporate image of the respondent's company in terms of capacity, capability and marketing strategy adopted by the firm.

3.8.1.2 Pre-testing of Questionnaire – Pilot Study

According to Walliman (2001), questionnaires should be pre-tested on a small population before administering it to a large sample size, in order to test the validity of the questions. The questionnaire was read through by the research supervisor to check for duplication of questions and to ensure that the questionnaire did address the research questions. After designing the questionnaire based on the formative study conducted, the draft questionnaire was sent to ten contractors in Nelspruit in the Mpumalanga province of South Africa, so as to ascertain the maximum time to complete the questions and to obtain feedback on any items that were not clear. The pilot study indicated that the questionnaire was completed within 15 minutes. Following respondents' recommendations, an additional answer of "Not Sure" was included in some questions.

3.8.1.3 Questionnaire Administration

The questionnaire was administered to senior people in senior management positions in their respective companies. The reason for this is that such individuals by virtue of their standing in their organizations possess a wealth of knowledge about their organizations and hence would have the most insight into the role played by operational variables in their company's performance (Cook, Heath & Thompson, 2000; Germain & Dröge, 1997; Kaynak, 2003). The study was undertaken between October 2012 and May 2013 (an eight month period). The questionnaire was accompanied with a covering letter (Appendix A). A covering letter serves to introduce the researcher to the participants before requesting any information from them as well as clarifying the purpose of the study so as to guide the participants in the right direction (Burns & Bush, 2006). It also serves as ethically correct procedure to request participants' consent to participate in the study and indicating the amount of time required to complete the questionnaire (Burns & Bush, 2006). Most of the questionnaires were delivered by hand to the respondents in their offices, some at pre-tender

briefings in some of the provinces (a few were emailed to the contractors). Delivering the questionnaire by hand afforded the researcher the opportunity to respond to questions and clarify anything about the study that was not clear to respondents.

Two hundred and five (205) contractors met the inclusion criteria to participate in the study. However, only one hundred and eighty five (185) out of the two hundred and five (205) were found to be accessible. These 185 received the questionnaire by hand or via email. Each participant was given two weeks to complete the questionnaire, upon which the responses could be physically collected or emailed. Telephonic contact with the respondents was made twice, on the day of delivery and two days before collection to ensure that the survey was completed on time. At the receipt of the each completed questionnaires, the data was captured onto a spread sheet.

3.8.2 Corporate Measurement

The study used both financial and non-financial indicators as a means of assessing the performance of the contractors that participated in the study. This study employed the constructs of *capacity*, *capability* and *marketing strategy* as outlined in the literature review in Chapter 2 as measures of construction companies' operational variables. The financial performance variable was also used to assess and measure corporate performance.

3.8.2.1 Return on Total Assets (ROTA %)

This was measured in terms of profit before tax, which is expressed as a percentage of the total assets. It is an indicator of both profitability and growth. According to Armstrong (2006), Ibrahim *et al.* (2009) and Oyewobi *et al.* (2013), ROTA is calculated as:

$$Return\ on\ Total\ Assets\ (ROTA) = \frac{Profit\ Before\ Interest\ and\ Tax\ (PBIT)}{Total\ Assets} \times 100\% \qquad (1)$$

3.8.2.2 Return on Capital Employed (ROCE %)

This is a measure of the profitability and growth of the firm as it measures the effectiveness of the management of the firm. It is defined as the ratio of profit before interest and tax to the total assets less current liabilities. According to Armstrong (2006) and Oyewobi *et al.* (2013), it is calculated as:

$$Return\ on\ Capital\ Employed\ (ROCE) = \frac{Profit\ Before\ Interest\ and\ Tax\ (PBIT)}{(Shareholders' Funds + Longe\ Term\ Loans + Other\ Long\ Term\ Liabilities) - Current\ Liabilities} \times 100\% \quad (2)$$

3.8.2.3 Profit Margin (PM %)

Profit margin is referred to as net profit on sales and reflects the degree of competitiveness in the market, the ability to differentiate products, the economic situation and ability to control expenses (Ibrahim *et al.*, 2006). According to Oyewobi *et al.* (2013), it is calculated as:

$$Profit\ Margin\ (PM) = \frac{Profit\ Before\ Interest\ and\ Tax\ (PBIT)}{Turnover} \times 100\% \quad (3)$$

3.8.2.4 Profit before Interest and Tax (PBIT)

This is described as the profit inclusive of interest and tax (Armstrong, 2006; Oyewobi *et al.*, 2013).

3.8.2.5 Turnover

This is the volume of contracts performed by construction companies, usually rated per year of its operation (Armstrong, 2006).

3.8.3 Secondary Data

Veshosky (1998) defines secondary data as published data for the use of sourcing information for other purposes other than the specific research at hand. Secondary data for this study however were collected from the respondent's annual audit reports and company bank statements. These were sourced through the contractors themselves. See Appendix E.

3.9 Data Analysis Procedure

Data triangulation was used in collecting the data (Leedy & Ormrod, 2005). Fellows & Lui (1997), define triangulation as the use of two or more research methods to investigate the same question, such as an experiment and interviews in a case study. The purpose of selecting this method is to counterbalance the disadvantages of the phenomenological and positivist paradigms whilst gaining the advantages of each and of the combination – a multi-dimensional view of the subject, gained

through synergy. Thus triangulation is about internal validation. The method involves both qualitative and quantitative data collection methods to support a particular proposition. In this study, qualitative data on the perceptions of the respondents regarding the operating variables of a company that enhances its corporate performance was collected by means of structured questionnaire, while the responding construction companies provided quantitative secondary financial data.

The data was analysed using quantitative techniques. It is imperative that the reliability and validity of the data be taken into consideration when conducting research. The validity of data is defined in terms of whether or not the data measures what it is supposed to measure. According to Golafshani (2003), data reliability is defined as measures of a representative fraction of the target group. The study adopted the relative importance index for data analyses. Respondents were asked to indicate their perceptions of the influence of a range of variables. Ranking the perceptions of the respondents was the overriding objective and was calculated using the formula outlined in Equation 4 (Bubshait & Al-Gobali, 1996; Holt, 2014). This was to rate the operational variables that are perceived by the respondents to have significant impact on their corporate performance. A relative importance index with a minimum value of 1 and a maximum value of 5, was used.

$$\text{Relative Importance Index (RII)} = \frac{5n_1 + 4n_2 + 3n_3 + 2n_4 + n_5}{(n_1 + n_2 + n_3 + n_4 + n)} \quad (4)$$

Where: n_1, n_2, n_3, n_4 and n_5 represent very high impact to no impact.

The mean score method was used to determine the relatively importance of each operational variable dimension amongst the five contractor grade categories. The mean is the average of all the observations in a given data, expressed as the sum of all observations as a ratio of total number of observations. Mean = Sum of all observations /Total number of observations.

The Kruskall-Wallis Test was used to test for differences in perceptions between the respondents in the various grades (Grade 2, 3, 4 5 and 6) regarding the capacity, capability and marketing strategy that enhances their performance. The Kruskall–Wallis Test is a non–parametric test that can be used with ordinal as well as interval or ratio data (Anderson *et al.*, 1994). The Kruskall-Wallis Test result

is detailed in Appendix F. The Spearman Rank Order Correlation Coefficient was used to establish the relationship between key operational variables and the corporate financial performance of construction companies in South Africa.

3.10 Bias

Bias is anything that influences or distorts data from what could have been obtained under normal conditions of pure chance (Leedy, 1997). The researcher made every effort to eliminate bias in the collection of the data. Moreover, there was no bias or unethical issues around both the primary and secondary data and responses that would have been acquired through the administration of the questionnaire and interviews at the pilot study. Data was collected according to accepted rules of research methodology.

3.11 Ethical issues in the study

Blumberg *et al.* (2005) describe ethics as moral principles and standards that are observed by the researcher in relation to his/her behaviour and relationship with the participants during a research study. The main aim of identifying and guarding against potential ethical issues in a research study is to avoid physical or psychological stress or harm to the persons taking part in the study.

However, ethical considerations in this research is viewed as a technique, system or perspective used in taken decisions on how the study was conducted with regards to the research participants (Resnik, 2007; Saunders, Lewis & Thornhill, 2009). Saunders, Lewis & Thornhill (2003) highlight key steps for researchers to take to ensure that their study is fully ethical:

- Acknowledge other peoples work when used in research study.
- Respect the privacy of the potential and actual participant of the research.
- Respect the right to voluntary participation of the participants and right to withdraw at any stage of the research.
- Respect and uphold the confidentiality and anonymity of the respondents.
- Avoid the infliction of physical and psychological stress such as embarrassment and

displeasure when collecting data.

- Avoid any negative impact on the participants through the way data is analysed and reported.

Therefore the conduct of this study was piloted by ethical considerations such as honesty, integrity of informed consent, confidentiality, carefulness and right to privacy (Leedy & Ormrod, 2005; Resnik, 2007; Shah, 2011). The above ethical principles were observed and carried out through the use of published ethics guidelines (Gay & Airasian, 2003; Neuman, 2006). An introductory letter (Appendix A) which accompanied the measuring instrument (Appendix B) addressed several ethical issues. It sought the respondent's consent to participate, ensured the confidentiality and anonymity of the respondents and informed the participants about the nature of the research. The participants were also given the opportunity to indicate whether they would want a copy of the report at the end of the research. Lastly, throughout the dissertation, the work of other people were duly cited and referenced.

3.12 Interpretation of data

The data collected from the questionnaire was analysed using quantitative techniques in order to:

- Determine the key operational variables perceived to impact on the financial performance of construction enterprises in South Africa;
- Determine which of the perceived indicators/variables has a significant relationship with the financial performance of construction firms in South Africa;
- Compare responses from the different grades regarding the operational variables that impact on their corporate financial performance in South Africa;
- Assess the relationship between the operational variables and the financial performance of construction enterprises.

The data was analysed based on how the questionnaire was drawn and was statistically interpreted; percentages and relationships between variables were also established. The interpretation was then used to write up the analysis. The information obtained from the relevant literature review was used to support the findings of the analyses in order to validate it with studies done by other researchers.

3.13 Summary

This chapter presents the research methodology adopted in this study. Research questionnaires supplemented by closed ended questions have been employed as the main data gathering instruments. The data collected was used to determine the operational variables of construction companies in South Africa and was predominantly quantitative in nature. The results obtained from the data collected are presented in the next chapter.

CHAPTER 4: DATA ANALYSIS AND PRESENTATION OF FINDINGS

4.1 Introduction

This chapter sets out to present the results of the survey that was conducted amongst South African contractors with the cidb grading of 2, 3, 4, 5 and 6 in the general building (GB) and civil engineering (CE) class of works. The data collected is both categorical/objective as well as perception based. The data reflected respondents' perceptions of the relative importance of key operational variables impacting on the financial performance of their construction companies. The following statistical tools were used to analyse the data:

Descriptive Statistics – i.e. Relative important index (RII)

Mean score

Kruskall-Wallis Test

Spearman Rank Correlation Coefficient

The chapter begins with a description of the demographic profile of the respondents, followed by the evaluation of the total response profile received from the self-administered questionnaire. The mean scores of the operational variables per contractor category are examined. The results of the Kruskall-Wallis test are presented. The result of the Spearman Rank Correlation Coefficient indicates the relationship between the operational variable dimensions and the financial performance of the construction firms of South Africa.

4.2 Response rate

A total of one hundred and eighty five (185) questionnaires were distributed. Fifty (50) questionnaires were distributed to grade 2 contractors, twenty five (25) to grade 3, thirty five (35) to grade 4, forty (40) to grade 5 and thirty five (35) to grade 9 contractors. Table 4.1 shows the response rate for the different grade category of the respondents.

Table 4.1: Response rate of the respondents

Grade Category	Questionnaires distributed	No of respondents	Response rate (%)
2	50	6	12%
3	25	12	48%
4	35	15	43%
5	40	20	50%
6	35	9	26%
Total	185	62	36%

Table 4.1 indicates that the overall response rate of the five contractor categories was 36%. In surveys, a high response rate helps to ensure the reliability and validity of the data and makes the data more representative of the target population (Baruch, 1999). The response rate achieved in this study is acceptable. Good response rates also ensure adequate sample sizes for statistical analysis and reduce problems associated with non-response bias (Ladik, Carrillat & Solomon, 2007). A response rate of 20 – 30% is fairly typical for a mail–out survey with a large sample of firms (Henderson, 1990). It is noteworthy that a lower response rate was achieved with the Grade 2 contractors. This can be probably attributed to the educational level of the respondents or in the manner in which they were contacted. However, no empirical test was done to compare the characteristics of those who responded versus those who didn't. Moreover, respondents who are not motivated or interested in the topic often do not complete the questionnaires which results in the low response rate (Baruch, 1999).

However studies have shown that response representatives are more important than response rate (Cook *et al.,* 2000). This assertion is supported by Baruch & Holton (2008) that response rate alone is not a proxy for assessing survey results; it is just one indicator that shows the potential contribution of the study.

4.3 The demographic profile of respondents

This section presents the demographic profile of respondents in the four provinces of South Africa used as the study population. It indicates the work designation of respondents, work category and the number of years of their company has existed in the construction industry.

4.3.1 Work designation of respondents in the study population

The questionnaire was administered to senior people in senior management positions in their respective companies. This section therefore presents the work designation of the respondents in the study. Table 4.2 shows the work designation of respondents in the study.

Table 4.2: Work designation of respondents in the study

Respondent's Work designation	No. of Respondents per work designation	Percentage (%)
Owner	23	37.10
Director	16	25.81
Management Staff	11	17.74
Technical Staff	12	19.35

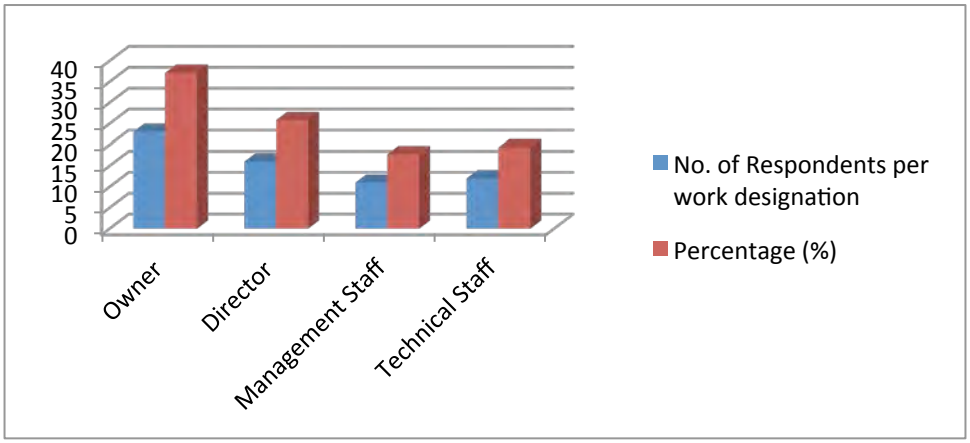


Figure 4.1: Work designation of respondents

Table 4.2 and Figure 4.1 show the work designation of the respondents used in the study. Over one third (37.10%) were owners; 25.81% were directors; 17.74% were managers; and 19.35% were technical staff (19.35%).

4.3.2 Work Category of respondent's company

The study sought to find out the work category of the respondent's company and data collected in this respect is presented in Table 4.3 and Figure 4.2.

Table 4.3: Work category of respondent's company

Work Category	No. of Respondents	Percentage
Civil Engineering Contractors (CE)	40	64.52%
General Building Contractors (GB)	17	27.42%
Electrical Engineering Works –Building	4	6.45%
Mechanical Engineering (ME)	1	1.61%

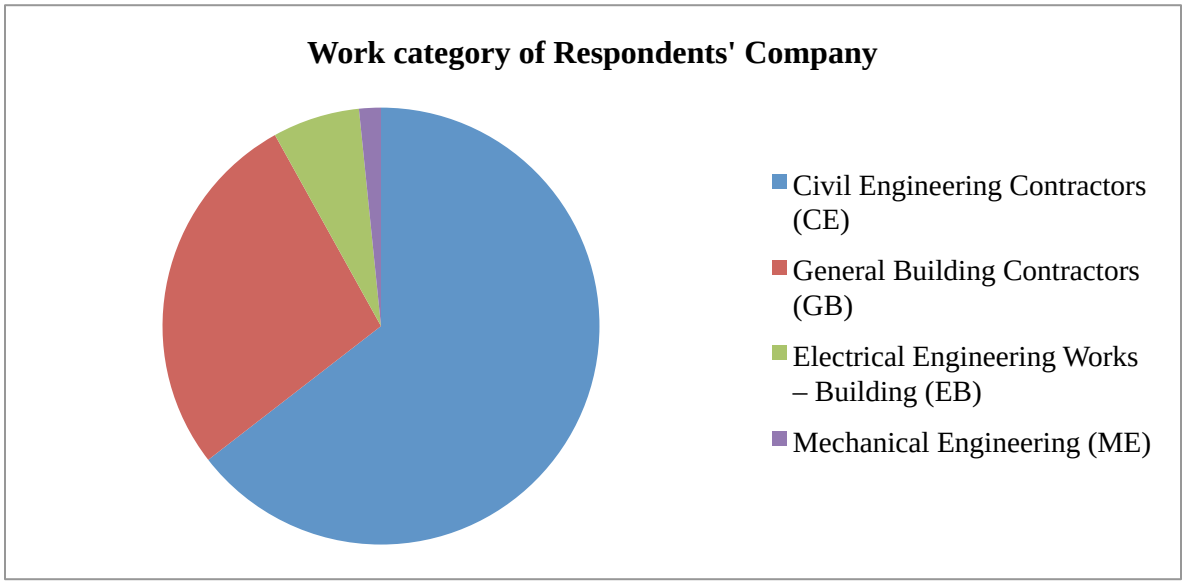


Figure 4.2: Work category of respondents

Table 4.3 and Figure 4.2 show that most companies in this study were civil engineering contractors (64.52%), followed by general building contractors (27.42%) of the responses. Four companies (6.45%) were classified as electrical engineering works and one company was an engineering contractor who was also registered in mechanical engineering works.

4.3.3 Respondents' companies years of corporate existence

The number of years of corporate existence of the respondents' companies was of great significance for the credibility and reliability of this research. The data collected in this regard is presented in Table 4.4.

Table 4.4: Number of years of corporate existence of respondents' companies

Number of years	Number of respondents	Percentage of respondent against total responses
1-5	14	22.58
5-10	37	59.68
10-15	8	12.90
15-20	3	4.84
Total	**62**	**100**

Table 4.4 shows that 22.58% of respondents' companies surveyed had been in the construction industry between 1-5 years, 59.68% between 5-10 years, 12.90% 10-15 years and 4.84% 15-20 years. More than three quarters of the companies had thus been in existence for more than five years. This is advantageous for the study because it is an indication that majority of the respondents filling the questionnaire are senior people in senior management positions in their respective companies. Therefore by virtue of their standing in their organizations possess a wealth of knowledge about their organizations and hence would have the most insight into the role played by operational variables in

their company's performance (Cook *et al.*, 2000; Germain & Dröge, 1997; Kaynak, 2003). Furthermore, the respondents work for companies that have a good number of years of experience in the construction industry.

4.3.4 Geographical spread/location of companies

This section of the research report gives an indication of the respondents' geographical spread/locations of business. Data collected in this regard is presented in Table 4.5.

Table 4.5: Geographical spread of companies in the survey

Respondents Geographical spread of business	Number of responses	Percentage of respondents
Within the company's environment (Local)	18	29.03
Within the province of the company (Provincial)	38	61.29
Extends beyond the province where the Company is headquartered (Regional)	6	9.68
Extends to all provinces within South Africa (National)	0	0
Extends outside the boarders of South Africa (International)	0	0

The majority of the companies (61.29%) operated at various sites across their own province, while 29.03% operated locally only. A further 9.68% operated in more than one province, but none operated across the whole country or internationally. This distribution is expected, given that the sample comprised small and medium sized enterprises who typically acquire contracts only within their local and provincial environment.

4.4 Data analysis and findings

The research investigated the key operational variables of construction companies that impact their corporate performance. This research adopted capacity, capability and marketing strategy as the key operational variables to investigate. Operational variables were further broken down into dimensions (factors) and indicators of these dimensions. In the questionnaire, respondents were asked to consider

each indicator and rate its influence on the financial performance of their firm and construction firms generally.

Three different types of analysis were conducted with this data. Firstly, Relative Importance indices were calculated (as described in Chapter 3) and the indicators within each dimension or operational variable were ranked according to these. The analysis thus calculated the relative importance of indicators of capacity; the relative importance of indicators of capability; and the relative importance of indicators of marketing strategy. Secondly, the mean scores for each variable were compared by contractor grade, to see whether there were any differences between the grades in the indicators that they perceived to influence their firm's financial performance. Thirdly, a correlational analysis was conducted to examine the relationship between perceived influence of operational variables and objective financial performance measures.

4.4.1 Relative importance analysis

The operational variable of capacity was represented in the study through four dimensions: technical ability, finance, human resources and technical and management skills of contractors. Each of these was operationalized through a range of specific indicators.

4.4.1.1 Relative importance of Capacity

This section presents the relative importance of capacity that impact on corporate financial performance.

4.4.1.1.1 Capacity in terms of Technical Ability

The study sought to assess the respondents' perceptions of the indicators of Technical Ability that influence construction companies' performance. Data collected in this regard is presented in Table 4.6.

Table 4.6: Perceptions of respondendents regarding the technical ability indicator that enhances corporate performance

Indicators of capacity in terms of technical ability	Rating of Respondents' Perceptions – frequency					RII	Rank
	Very High Impact ……..No Impact						
Experience/knowledge of technical skill	21	34	5	2	0	4.19	1
Capacity of construction Equipment and Plant	12	36	11	3	0	3.92	2
Qualification of technical staff	9	34	19	0	0	3.84	3
Number of Technical Staff	15	27	12	7	1	3.77	4
Adequacy of Administrative Staff	8	36	9	7	2	3.66	5
Rate of applying the new technology developed internally	11	32	9	6	4	3.65	6
Utilization and efficiency of Equipment and Plant	4	42	5	7	4	3.56	7
Maintenance of Plant and Equipment	10	24	16	12	0	3.52	8

Table 4.6 shows the respondents' perceptions regarding the impact of the indicators of technical ability. In terms of rankings, the respondents perceived that experience or good knowledge of technical skills had the strongest impact on the performance of the firm. Experience/ knowledge was rated first with a relative importance index (RII) score of 4.19. Second in importance was the construction equipment and plant owned by the company (RII=3.92), followed by the qualifications of the technical staff (RII=3.84).

4.4.1.1.2 Financial Capacity

From the review of literature, finance is regarded as one of the key factors that influence performance of firms. Therefore, the study sought to investigate and establish the relationship between financial capacity and corporate performance. The indicators of financial capacity that were used in the study are presented in Table 4.7.

Table 4.7: Perceptions of respondents regarding financial ability that enhances corporate performance

Indicators of capacity in terms of financial capital	Rating of Respondents' Perceptions – frequency					RII	Rank
	Very High Impact……No Impact						
Value of annual loans obtained	16	39	3	2	2	4.05	1
Value of annual contract works (turnover)	10	42	6	2	2	3.90	2
Growth rate of Organizational Profit Status	6	39	17	0	0	3.82	3
Organizational Asset Status	7	28	22	4	1	3.58	4
Organizational Profit Status	9	32	8	7	6	3.50	5
Effective communication with Financial Institutions	3	35	15	5	4	3.45	6
Knowledge about financial policy	1	40	10	5	6	3.40	7
Growth rate of Organizational total Asset	3	37	6	9	7	3.32	8
Payment to sub-contractors/suppliers on time	5	26	18	8	5	3.29	9
Capability of Loan repayment	2	34	12	7	7	3.27	10
Organization Debt Status	6	31	8	5	12	3.23	11

Table 4.7 indicates that the respondents perceived annual loans to have the strongest impact on the performance of construction companies (RII=4.05). This is followed closely by value of annual contract (turnover) which was ranked second (RII= 3.90). The growth rate of organizational profit status was ranked third (RII=3.82).

4.4.1.1.3 Management skills Capacity

Importance ratings of the management skills that enhance corporate performance are presented in Table 4.8

Table 4.8: Perceptions of respondents regarding management skills capacity

Indicators of capacity in terms of management skills	Frequency of importance ratings by response category (Very High Impact …… No Impact)					RII	Rank
Availability and effectiveness of quality management system	11	37	7	4	3	3.79	1
Delivery of project on time	11	36	6	6	3	3.74	2
Availability and effectiveness of risk management systems	12	29	13	5	3	3.68	3
Effectiveness of site management	5	39	12	2	4	3.63	4
Effectiveness of financial management	5	31	22	4	0	3.60	5
Performance during the warranty period	16	20	11	11	4	3.53	6
Level of budget/cost overrun	4	34	13	11	2	3.40	7
Availability and competence of manager	9	27	14	4	8	3.40	7

Table 4.8 reveals the perception of contractors regarding the impact of management skills on corporate performance. Overall the respondents perceived that having an effective quality management system was the most important (RII=3.79). This was closely followed by delivery of projects on time (RII=3.74). The availability of risk management systems was ranked third (RII=3.68).

4.4.1.1.4 Capacity in terms of Human Resources (staff size)

This research refers to human resources as the staff of the organization; the terms “human resources” and “staff” are used interchangeably. Data collected in this regard is presented in Table 4.9.

Table 4.9: Perceptions of respondents regarding the human resource capacity that enhances corporate performance

Indicators of capacity in terms of human resources	Frequency of importance ratings by response category (Very High Impact……..…No Impact)					RII	Rank
Ratio of technical and professional staff in the organization to number of site operatives	11	38	12	1	0	3.95	1
Appropriateness of personnel structure	13	31	13	2	3	3.79	2
Mechanism of staff recruitment	9	38	4	5	6	3.63	3
Existence of strategies for human resource development	8	35	2	6	11	3.37	4
Career prospect with the organization	8	35	2	6	11	3.19	5

Table 4.9 summarises the respondents' ratings of indicators of human resource capacity that impact on corporate performance. Respondents ranked the ratio of technical and professional staff in the organization to the number of site operatives as being the most important (RII=3.95). This was followed by appropriateness of personnel structures (RII=3.79) and career prospects with the organization (RII=3.74).

4.4.1.2 Relative importance of indicators of capability

The operational variable of capability was measured directly by means of two indicators, namely the availability of resources and programs for training staff and the appropriateness of organizational structure in terms of the organization's operation. The data collected on the indicators of capability is presented in Table 4.10, below.

Table 4.10: Perceptions of respondents regarding the construction companies' capabilities that enhance corporate performance

Indicators of firms' capabilities	Frequency of impact ratings by response category					RII	Rank
	Very High Impact……				No Impact		
Availability of resources and programs for training your staff	14	30	12	6	0	3.84	1
Appropriateness of organizational structure in terms of organization's operation	8	37	7	8	2	3.66	2

Table 4.10 summarises the perceptions of contractors regarding indicators of capability that impact on corporate performance. The respondents ranked the availability of resources and programs for training staff (RII=3.84) ahead of the appropriateness of organizational structure in terms of the organization's operations (RII=3.66).

4.4.1.3 Relative importance of indicators of Marketing Strategy

The third operational variable to be investigated was the company's marketing strategy. This was analysed in terms of two dimensions: networking and the geographical spread of the business. Each of these dimensions was operationalized in the questionnaire through a range of indicators, with respondents being asked to rate the level of impact of each indicator on performance.

4.4.1.3.1 Marketing Strategy in terms of Networking

Marketing strategy in terms of networking is referred to as the relationship of contractors with industry stakeholders. This variable was operationalized in terms of seven indicators, as summarised in Table 4.11 below.

Table 4.11: Perceptions of respondents regarding networking strategies of construction companies that enhance their corporate performance

Indicators of marketing strategy in terms of networking	Frequency of impact ratings by response category					RII	Rank
	Very High Impact ……... No Impact						
Relationship with clients	15	38	8	1	0	4.08	1
Relationship with suppliers	14	36	9	1	2	3.95	2
Relationship with consultants	11	32	19	0	0	3.87	3
Relationship with sub-contractors	16	30	9	5	2	3.82	4
Relationship with news media	14	26	15	6	1	3.74	5
Relationship with governmental departments	8	34	13	6	1	3.68	6
Relationship with private sector developers	4	31	12	6	9	3.24	7

Table 4.11 indicates that respondents ranked the relationship with clients as being the most significant factor that impacts on construction companies' corporate performance (RII=4.80). This was followed by the relationship with suppliers (RII=3.98) and relationship with consultants (RII=3.87).

4.4.1.3.2 Marketing Strategy in terms of Geographical Spread of Business

This research refers to geographical spread of business as the areas where the construction company operates. The study investigated the perceptions of respondents regarding the relationship between indicators of geographical spread of business (a form of marketing strategy) and corporate performance. The respondents' ratings are presented in Table 4.12.

Table 4. 12: Perceptions of respondents regarding the indicators of geographical spread of business that enhances construction company performance

Indicators of marketing strategy in terms of geographical spread	Frequency of by response category impact ratings					RII	Rank
	Very High Impact	Impact	……...		No Impact		
Local	15	36	7	3	1	3.98	1
Provincial	6	39	13	4	0	3.76	2
Regional	4	33	16	5	4	3.45	3
National	4	27	19	6	6	3.27	4

The analysis shown in Table 4.12 reveals the respondent's perception about the influence of operating at various degrees of geographical spread, ranging from local to national. A local geographical spread was rated as being the most influential to the company's performance (RII=3.98), with ratings decreasing as geographical spread increased.

4.4.2 Mean Score Method

In order to identify which operational variables were perceived to have a significant impact on the financial performance of construction firms, mean scores were computed from the entire operational variable indicator within each factor. The results obtained from the computation of the mean revealed that the relative importance of the entire operational variable is largely similar in all the five grade categories. Table 4.13 shows the mean scores and the rank for each operational variable.

Table 4.13: Relative importance index

Operational variable sub- factors	Grade 2		Grade 3		Grade 4		Grade 5		Grade 6	
	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
Technical Ability	3.42	7	3.88	3	3.73	4	3.94	2	3.51	4
Financial capital	3.15	8	3.58	7	3.69	6	3.48	7	3.32	7
Technical and management skills	3.45	6	3.39	8	3.85	2	3.56	5	3.60	3
Human resources	3.60	4	3.62	6	3.89	1	3.77	4	3.38	5
Coaching/mentoring	3.80	2	4.17	2	3.47	8	3.85	3	3.78	1
Organisational structure	4.00	1	4.00	1	3.67	7	3.35	8	3.22	8
Networking	3.55	5	3.81	4	3.70	5	3.97	1	3.57	2
Geographical spread	3.79	3	3.67	5	3.75	3	3.55	6	3.36	6

Note: 1= Highest rank and 7 = Lowest rank

4.4.3 Comparative perceptions responses from the different grade categories.

In order to complement the mean score, the Kruskall-Wallis test was computed to see whether the perceptions of the five contractor grade categories are the same with regards to the operational variables that impact on their financial performance. Therefore, to further explore the differences that may likely exist in the perceptions of respondents regarding operational variables that impact construction companies' performance with respect to the different groups, the study used Kruskal-Wallis which is a non-parametric analysis of variance. This was employed because of the need to compare more than two independent groups and when variables being measured do not meet the

underlying normality assumptions of ANOVA test. Kruskal-Wallis H test is similar to a one-way ANOVA and is an extension of the Mann-Whitney U test that allows groups to be compared. Kruskal-Wallis is used in this study because the measurement variables are not normally distributed and also because of the need to understand whether there are differences in the perception of the respondents involved in the research. The results of the Kruskall-Wallis are presented in the following tables regarding the operational variables of the study.

Table 4.14: Kruskal-Wallis Test Statistics Technical ability

Chi-Square	13.611
df	4
Asymp. Sig.	.009

Kruskal Wallis Test

Grouping Variable: Grades of contractors

Table 4.15: Kruskal-Wallis Test Statistics Financial capacity

Chi-Square	6.666
df	4
Asymp. Sig.	.155

Kruskal Wallis Test

Grouping Variable: Grades of contractors

Table 4.16: Kruskal-Wallis Test Statistics Technical & Management skill

Chi-Square	9.240
df	4
Asymp. Sig.	.055

Kruskal Wallis Test

Grouping Variable: Grades of contractors

Table 4.17: Kruskal-Wallis Test Statistics Human Resources

Chi-Square	7.964
df	4
Asymp. Sig.	.093

Kruskal Wallis Test

Grouping Variable: Grades of contractors

Table 4.18: Kruskal-Wallis Test Statistics Geographic spread

Chi-Square	3.578
df	4
Asymp. Sig.	.466

Kruskal Wallis Test

Grouping Variable: Grades of contractors

Table 4.19: Kruskal-Wallis Test Statistics- Networking

Chi-Square	7.366
df	4
Asymp. Sig.	.118

Kruskal Wallis Test

Grouping Variable: Grades of contractors

Table 4.20: Kruskal-Wallis Test Statistics Organisational Structure

Chi-Square	7.927
df	4
Asymp. Sig.	.094

Kruskal Wallis Test

Grouping Variable: Grades of contractors

Table 4.21: Kruskal-Wallis Test Statistics Coaching

Chi-Square	2.738
df	4
Asymp. Sig.	.603

Kruskal Wallis Test

Grouping Variable: Grades of contractors

Based on the results of the Kruskal-Wallis test statistics, there was a significant statistical difference between the perceptions of grades 2-6 contractors regarding operational variables that impact construction companies' performance such as technical ability (p = 0.009) which is significant at 1% level of confidence. The perception of the contractors across the grades is also significant at 10% level of confidence for technical and management skill (p = 0.55); organisational structure (0.094) as well as human resources (p = 0.093). However, the results of analysis presented in Tables 4.15, 4.18, 4.19 and 4.21, using Kruskal-Wallis in examining if there is significant differences in the perceptions of the different categories of respondents used in the survey show that financial capacity, geographic spread, networking as well as coaching were not significant. This is shown by the p-value which is greater than 0.1 and this indicates that there are no significant differences in the perceptions of the respondents at 90% confidence level.

From the result of the Kruskal-Wallis test, it can be seen that the there is no significance difference in the perceptions of the respondents in the five contractor grade categories regarding the operational variables that impact performance. The contractor population therefore are similar in perception regarding the importance of the various operational variable indicators that influences performance of construction companies in South Africa.

4.4.4 Correlations between operational variables and measures of financial performance

This section presents the Spearman Rank correlation coefficient analysis between the operational variables and measures of corporate financial performance. Table 4.14 shows the Spearman Rank correlation coefficient analysis of the key operational variables and corporate performance.

Table 4.22: Spearman Rank Correlation Coefficient

OPERATIONAL VARIABLE FACTORS	PBIT	TURN-OVER	TA	NA	ROTA	ROCE	PM
TECHAB	.055	.318*	.234	.321*	-.098	-.094	.019
FINCAP	-.096	.485**	-.102	.030	-.054	-.107	.815**
TECHMAS	-.113	-.152	.013	.119	-.055	-.110	.062
HUMRES	-.140	-.152	-.048	-.047	-.084	-.075	-.143
COACH/MEN	.029	-.363**	-.019	-.046	.026	.024	.034
GEOSPR	-.104	-.169	-.210	-.224	.056	.061	.001
NETW	.021	.376**	.118	.221	-.055	-.110	.531**

**$p \leq 0.05$; *$p \leq 0.01$

Table 4.22 indicates Spearman rank correlations between the various operational variable indicators and financial performance. Positive, statistically significant correlations were found between technical ability and turnover (.318*); technical ability and net assets (.321*); financial capacity and turnover (.485**); financial capacity and profit margin (.815**); networking and turnover (376*); and networking and profit margin (531**). A statistically significant negative correlation was found between coaching / mentoring (staff training) and turnover (-363*).

4.6 Summary of survey results

The results of the survey can be summarized as follows:

The overall response rate of respondents was 36%, which is deemed acceptable. The respondents in the survey occupied technical and management positions in their companies. The ratings of the

perceived influence of operational variable indicators were analysed using the relative importance index. In terms of technical ability of the company, the respondents rated experience and knowledge of technical skills first, capacity of construction plant and equipment second and qualification of technical staff third. The value of annual loans was rated as most influential of financial capacity, followed by turnover. The effectiveness of the quality management system emerged as first with regards to technical management skills, followed by punctual project delivery and the existence of a risk management system. The ratio of technical and professional staff was rated highest by the respondents in terms of human resource capacity. This was followed by the appropriateness of the personnel structure and career prospect with the organization. In terms of capability, coaching or training of organizational staff emerged as being more important than appropriateness of organizational structure. Relationships with clients, suppliers and consultants were perceived as being the most influential aspects of networking on enterprise performance. In terms of the geographical spread of the companies that will enhance their performance, the respondents held the view that their local environment in which they are registered impact most on their performance followed, followed by operating in the province in which they are registered.

The Kruskall–Wallis test revealed that the five contractor populations are similar in their perceptions regarding the importance of the operational variable indicators that impact on their financial performance. Amongst the five contractor grading, networking was seen to be critical for their success and was rated from medium to high, whilst financial capacity had the lowest mean and hence the lowest ranking. The Spearman Rank Correlation Coefficient revealed that a positive significant relationship exist between technical ability, financial capacity and networking with financial performance. It further reveals that a negative relationship exist between coaching/mentoring and financial performance.

CHAPTER 5: DISCUSSION OF FINDINGS

5.1 Introduction

This chapter discusses the findings of this treatise and relates them to the existing literature. The research questions posed in the first chapter of the study will be considered carefully. In addition, the objectives of the study will be reviewed in order to ascertain whether they have been accomplished.

5.2 Answering the research questions

The research set out to answer three questions regarding the operational variables that might influence the financial performance of small and medium-sized South African construction companies:

- How are the operational variables perceived to influence construction companies' financial performance?
- How do personnel across different cidb grade categories (2 to 6) share the same views on which operational variables influence construction companies' financial performance?
- What is the relationship between perceptions of the influence of the operational variables and objective financial performance?

5.2.1 How are the operational variables perceived to influence construction companies' financial performance?

The international literature suggests that there are operational variables that impact on construction companies' financial performance. The perceptions of the respondents in the present study are in line with this idea. The survey results demonstrated that in South African construction firms, operational variable indicators are understood to impact on corporate financial performance. This is seen in the relative importance ratings of the operational variable indicators.

5.2.1.1 Technical capacity

The data suggested that within this subcategory of variables, respondents perceived experience and knowledge of technical skills, capacity of plant and equipment and the qualifications of technical staff, to have the most influence on firms' financial performance. With regards to experience and knowledge, the findings are in line with assertions made by previous researchers that knowledge and intellectual capital are fundamental bases of competencies and are key factors of performance, e.g. (Abu Bakar *et al.*, 2011; Bubshait & Al-Gobali, 1996; Falsey, 1989; Lubit, 2001; Malinen, 2001).

In addition, the findings from the present study support earlier studies that highlight the ways in which plant and equipment enable a company to perform (Tam & Harris, 1996). Respondents perceived capacity in construction plant and equipment as affecting performance, even though some researchers are of the view that plant and equipment are not determinants of performance (Teece *et al.*, 1997). However, it should be noted that the cost of purchase and time to delivery of equipment will probably affect the progress of any construction activity since most construction projects are mostly time bound (Rashid & Morledge, 1998; Wang, 1987).

5.2.1.2 Financial capacity

There seems to be consensus in the literature that the financial capacity of firms is a significant factor that impacts on the corporate performance of construction companies. The availability of finance and adequate cash flow has been shown to enhance company performance (Abu Bakar, 1993; Beatham *et al.*, 2004; ILO, 1987; Naoum, 2003). This may be particularly relevant for smaller contractors (Kayanula & Quartey, 2000). Profitability is also an important aspect of the corporate financial performance criterion and is the main aim of any business (Beatham *et al.*, 2004). The survey responses in the present study are in line with these arguments. Respondents perceived the availability of annual loans and work turnover as influencing the performance of construction companies. They also rated the growth rate of the profit status of firms as important.

5.2.1.3 Management capacity

The study investigated perceptions about the influence of the management resources within construction firms. The findings suggest that among the management indicators, an effective and efficient quality management system of a firm, the firm's ability to deliver projects on time and the firm's risk management system were perceived to significantly impact on company performance. These findings are supported by previous studies done by Thomas *et al.* (2002) and Ling *et al.* (2009). Those authors argue that quality delivery of products or services by any organization reduces maintenance or reworking cost and therefore increases the profitability of the firm (which is a performance criterion). Several studies provide empirical evidence of the importance of management skills for business performance, e.g. (Abu Bakar, 1993; Soetanto *et al.*, 2001; Tam & Harris, 1996; Wijewardena & De Zoysa, 2005; Yusuf, 1995). Chan & Chan (2004), also note that technical and management systems also involve the degree to which construction projects are managed without major accidents occurring, which reduces time and cost and hence increases the profitability of the firm. Research done by Chan & Chan (2004) also validate the findings of the current research in terms of safety management skills. They assert that adhering to safety management procedures will reduce cost and time and hence increase profitability.

5.2.1.4 Human resources capacity

Several indicators of human resource capacity were used in the survey. The results indicate that respondents perceived the most important factors to be the ratio of technical and professional staff to the number of site operatives; the appropriateness of the personnel structure; and career prospects with the organization. Prior studies concur that human resource capacity, especially with regards to competent technical and professional staff, enhances an organization's performance (e.g. Bonaccorsi & Giannangeli (2010); Chan *et al.* (2001); Morrison *et al.* (2003); Ogunlana *et al.* (1996); Raftery *et al.* (1998); Stam *et al.* (2006); Wang (2000)). There seems to be general consensus in the literature that a construction firm's performance is highly influenced by the appropriateness of its human resources.

It is interesting to note that firms without the requisite personnel tend to have problems in their supervisory roles and hence often produce poor quality products/services (Rashid & Morledge,

1998). Conversely, companies that have good technical and professional staffing are more likely to produce quality products/services. Client satisfaction brings in repeat business, which in turn enhances financial performance. Hanson *et al.* (2003) acknowledges that poor client satisfaction due to conflict, poor workmanship and incompetent contractors negatively affect firms' performance. Reichheld & Sasser (1990), Rust & Zahorik (1993) and Anderson *et al.* (1994), empirically demonstrated that delivering high quality goods and services enhances client satisfaction, which leads to profitability and a steady stream of cash flow – translating into good financial performance.

5.2.1.5 Capability

The capability of construction firms was understood in terms of two variables: availability of resources for training personnel and having an appropriate organizational structure. In the survey data, both of these variables were highly rated by the respondents. Studies done by Brumwell & Reynolds (2006), Chidiac (2006), Perry (2006) and (Coutu & Kauffman, 2009) reveal that training employees in order to improve technical skills enhances companies' performance. Schneider *et al.* (2007) also suggest that employee development enhances organizational performance and leads to high growth; whilst Stata (1989), Leonard-Barton (1992) and Garvin (1993) note that the ability of a firm to train their personnel underpins organizational capability. The present study found that construction company personnel were aware of the importance of having the resources to develop employees' skills.

Assertions made by Argyres (1995) and Teece (1996), also support the findings of the research with regards to organizational structure. They opined that adequate organizational structure of firms, as a significant factor of capability, impacts greatly on performance. In a similar vein, Nelson & Winter (1982) have argued that firms are largely governed by their organizational routines or structure and that this brings about their performance. Poor structure and routines thus lead to poor performance. Several existing studies have shown that many small and medium construction companies lack the basic skills to do their work well, which affects their performance negatively Moss (2008). This indicates that small and medium construction firms need to train their staff in order to improve their skills to effectively implement their building projects. The current research suggests that the capability of construction firms is viewed as relying on the availability of resources to constantly

train and improve the skills of staff, as well as the requisite organization structure to implement certain works.

5.2.1.6 Marketing strategy in terms of networking

The study measured respondents' perceptions about the impact of networking on financial performance. Networking is understood here as the relationships between contractors and construction industry stakeholders. The survey respondents rated relationships with clients as the most important, followed by suppliers and sub-contractors. The existing literature supports this finding. Studies have found that relationships with industry stakeholders are a critical factor for firms' growth and that networks play a significant role in the success and survival of construction companies (e.g. Tan *et al.* (2007)). According to Florin *et al.* (2003), networking provides value to members by allowing them access to both social and material resources that enhance their performance. In summary, both social capital theory and innovation theory suggest that networking can potentially lower a firm's risk of failure and increase its chance of success (Zhao & Aram, 1995).

Good contractor relationships with clients are only possible if the contractor is meeting the demands of the client. If this is the case, the client considers the contractor for repeat business. When clients provide contractors with on-going work, this improves the contractors' cash flows and in increases their profitability. The relationship between contractors and suppliers can also be viewed as one that enhances the contractors' performance. Suppliers tend to offer lower prices to contractors with whom they have a good relationship; they effectively protect that contractor so that he/she can be awarded the contract. Thus discounted pricing of supplies helps contractors to make competitively priced bids and secure tenders. This also enables contractors to have repeat business and increases their profitability. Subcontractors play an import role in any construction project implementation, so the company's relationship with them is vital. They often undertake an appreciable amount of the work at the construction site, so the quality of the work also depends on them. Production of quality work and services always brings about client satisfaction, which is a performance criterion.

5.2.1.7 Marketing strategy in terms of geographical spread

The research further investigated whether the geographical spread of construction business of the respondents was perceived to influence their performance. The analysis shows that contractors perceived operating locally and within the province in which they are registered as most significantly influencing firms' financial performance. This is not specifically supported in literature but geographical spread of business as posited by Hillebrandt (1979), enhances business performance by increasing its market share. The importance ratings of the geographical spread items suggest that contractors believe that operating within their environment gives them a greater chance of survival and continuous operations.

5.2.2 Comparative perception responses from different grade categories

The Kruskall–Wallis test was used to compare responses across the five contractor grades. No significant differences were found between the different sets of respondents regarding the relative importance attributed to financial capacity, geographical spread of business, networking and coaching/mentoring variables in the study. Therefore we can conclude that personnel across the different sizes of companies seemed to share general perceptions about what influences companies' financial performance.

Table 4.13 indicates the relative importance of the operational variable indicators in the previous chapter. It can be seen that financial capacity was rated low by the respondents across contractor grade categories which suggests that South African construction firms are not aware how important financial capital and adequate cash flow are to their performance (Abu Bakar, 1993; Calvert *et al.*, 2003; Hillebrandt & Cannon, 1990; Kayanula & Quartey, 2000). It is not surprising that contractors are not performing in South Africa due to lack of capacity and capability, with finance being an integral part (cidb, 2013; Statistics South Africa, 2005). Most companies go out of business because they are not solvent than fail because they are not profitable (Calvert *et al.*, 2003). By contrast, participants had a good appreciation of the role of networking and technical ability. These two variables had high to moderate mean scores across all grade categories (with the exception of the grade 2 participants, who ranked technical ability low) although this was not a statistically significant difference. The contractors in four of the grade categories held the view that training of

the organization's staff is an integral part of the firm's performance; this variable had the highest mean score except for grade 4 contractors.

Respondents in three categories had the same level of recognition that management skills are a significant factor for enterprise performance. Although the mean rank score of this operational variable indicator is not the lowest when compared to others, there is certainly room for improvement in this area by construction firms in South Africa. Given the shortage of skills currently in the construction industry, construction firms need to put more effort into improving and retaining management skills.

The importance of human resource capacity as enhancing organizational capacity was appreciated by all grade categories, even though it was not rated equally by the respondents. It is important for construction companies to understand the vital role played by human resources management, so that they will aim for higher levels of strategic and human resource planning. This would in turn have a significant impact on organizational performance, including higher productivity, greater cost effectiveness and greater overall efficiency (Ferris *et al.*, 1990). Adequate human resource capacity in terms of technical and professional staff has a significant relationship with firm performance (Stam *et al.*, 2006); construction firms often fail due to inadequate human resource capacity (Chan *et al.*, 2001; Morrison *et al.*, 2003; Ogunlana *et al.*, 1996; Raftery *et al.*, 1998; Wang, 2000).

All the respondents recognised the role played by the geographical spread of their business, even though the geographical variables were not rated highly by all contractors. When comparing the mean scores across the contractor grade categories, the appreciation and ranking of this variable by the firms is in line with the literature review. It is clear that firms which are able to extend their operations in the geographical environment in which they are registered, are able to increase their market share and turnover (Hillebrandt, 1979). Hisatomi (1990) notes that increasing market share is important for a construction firm's survival. To sum up, the survey found that networking was rated as being important by all contractor grades used in the study, with a mean ranging from medium to high. Capacity in terms of technical ability was also rated as important by all contractor grade categories except for grade 2. Financial capacity had the lowest mean and hence had the lowest ranking by all five contractor grade categories. The participants in the study thus shared a

degree of consensus that networking and technical ability have a significant effect on financial performance of construction firms in South Africa; and that financial capital is relatively insignificant.

5.2.3 What is the relationship between perceptions of the influence of the operational variables and objective financial performance?

The use of the Spearman rank order correlation coefficient found significant positive relationship between the various operational variable indicators and financial performance. Positive, statistically significant correlations were found between technical ability and turnover as well as technical ability and net assets. This indicates that construction firms that have adequate capacity in terms of the effective use and possession of plant and equipment are associated with high work turnover and profit margin. The present survey result is in line with previous studies done by Hatush & Skitmore (1997) who are of the view that the effective use and possession of plant and equipment impacts on construction firms' performance in terms of profitability and turnover. This is also supported by Tam & Harris (1996) who held the view that equipment as a contributor to technical ability is a performance criterion. The Spearman rank order correlation coefficient also found positive significant relationship between financial capacity turnover and profit margin. This result also reveals that companies with good financial standing are associated with high work turnover and profit. This result is aligned with previous studies by Abu Bakar (1993), Hillebrandt & Cannon (1990) who assert that financial availability and adequate cash flow of construction firms enhances their performance. This is also supported by Calvert *et al.* (2003). They affirmed that far more companies go out of business because they are not solvent. Networking was also found to have significant positive relationship with turnover and profit margin. This relationship indicates that firms that have network with industry stake holders often have high work turnover and profit. This finding is aligned to previous studies done by Neergaard *et al.* (2005), Jack *et al.* (2010) and Gilmore *et al.* (2006). They held the view that networking plays a significant role in the growth of firms and influences on their corporate performance. A statistically significant negative correlation was found between coaching / mentoring (staff training) and turnover. This is supported by studies done by Muir (2009), McGuffin & Obonyo (2010), Brumwell & Reynolds (2006). They held the view that coaching and mentoring enhances productivity and performance of firms.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

In the interests of infrastructure delivery, economic growth and job creation, it is important that South Africa has a large base of effective, productive and financially viable small and medium sized construction companies. However, the reality is that South African SME construction companies often produce a poor quality of work and have a high rate of business failure. The research reported in this thesis set out to investigate one aspect of this problem, by exploring the factors that underpin construction companies' effectiveness and financial success.

The research took the form of a questionnaire administered to technical and management staff at construction firms in four provinces of South Africa. The companies involved in the study were selected on the basis that they were registered in grades 2 to 6 of the cidb register and were involved in a contractor development programme. A final sample of 62 respondents provided the data for the study. The study aimed to identify the key operational variables that are perceived to impact on construction companies' financial performance. The study further compared responses across the contractor grades, to see if they shared their views on which variables are important for companies' success. Lastly, the study investigated the relationships between building professionals' perceptions of the influence of key operational variables and the actual financial performance of their companies.

6.2 Aim and Objectives of the Study

This research aims at examining whether there are key operational variables that impact on the corporate financial performance of construction companies. To achieve the aim of the research, the following objectives were outlined in the study:

- Determine the key operational variables perceived to impact on the corporate financial performance of construction firms in South Africa.

- Determine which of the perceived indicators/variables have a significant effect on the corporate financial performance of construction firms in South Africa.
- Compare responses from the different grade categories, to see whether different sized firms have divergent perceptions of the operational variables that impact on their corporate financial performance.
- Evaluate the relationship between the perceptions of the influence operational variables and the objective corporate financial performance of construction firms in South Africa.

The objectives of the research have been achieved. The responses to the research questions have addressed the objectives correctly and appropriately as indicated in Chapter 5. Therefore, conclusions below were drawn based on the findings discussed earlier in the preceding chapter (Chapter 5).

6.3 Conclusions

From the findings of the research, the following conclusions can be drawn with regards to operational variables used by SME construction companies in the contracting business.

6.2.1 Technical Capacity of Firms

The respondents perceived that within this subcategory of variables, experience and knowledge of technical skills, capacity of plant and equipment, qualifications of technical staff, to have the most influence on firms' corporate financial performance. It can be concluded that the performance of the lower level contractors depends on the experience and knowledge of technical skills of the firm, coupled with the amount of plant and equipment acquired over the years to execute the work and the level and qualification of its technical staff. Firms that have the experience in the construction industry, possesses plant and equipment and have the requisite qualified technical staff would perform better than firms that don't have these capacities.

6.2.2 Financial Capacity of Firms

The findings suggest that the availability of finance to lower level contractors, whether in the form of financial loans or job acquisition, enhances adequate cash flow of the firm and hence impacts on

their performance. It follows also that the rate of profit accumulation of the construction business enhances its performance.

6.2.3 Technical and Management Skills

The study found that adherence to standards and specification of construction projects by lower level firms assists them to have repeat business from clients, which improves their corporate performance. It can also be concluded that the use of risk-based management systems and the effective management by SMEs to achieve speedy conclusion of construction projects, greatly impact on their performance.

6.2.4 Human Resources (staff size)

The findings suggest that construction firms perform better when the ratio of technical and professional staff to site operatives is adequate. It can however be inferred that construction firms need qualified technical and professional staff to enhance their performance. It can be further concluded that the appropriateness of the personnel structure of the firm and the availability of continuous employment of the employees, also impact on the performance of the firm. This makes it possible for experienced personnel to stay in the organization, which in turn improves the performance of the firm.

6.2.5 Capability (Coaching and mentoring)

The research tested two factors that influence capability of construction companies. These factors are the availability of finance for training (coaching or mentoring) and the appropriateness of organizational structure based on the operations of the firm – i.e. the organogram of the firm. Both of the two factors were rated highly by the respondents. In summary, it can be concluded that construction firms need to train their staff in order to improve their performance. This can be done through mentoring, which would require making available funds to lower level contractors for them to gain specialised training in technical skills. It can be further concluded that the adequacy of the organizational structure based on the organization's operations highly influences the performance of the organization.

6.2.6 Networking – Relationship with Industry Stakeholders

The study found that construction companies' relationships with clients, suppliers and consultants enhances their financial performance. It also emerged that construction companies' relationships with their clients, suppliers and consultants depends on previous performance with the client and trust between the firm, suppliers and consultants.

6.2.7 Geographical Spread of construction firms

From the research findings it can be concluded that the lower level construction firms operate more in their local environment and they perceive this to impact on their performance. This is followed by operating in the province where the company is registered. It can be inferred therefore that lower level construction firms can perform better in their local community or the province in which they are registered.

From the foregoing, the survey results have demonstrated that there are operational variables perceived to have significant influence on construction company financial performance. The literature review has also provided evidence that supports these findings. Overall, the operational variables that are perceived to have the greatest impact on the financial performance of South African construction firms are networking and the effective use and possession by assets by the firm.

6.2.8 Research Proposition

The research proposes in Chapter 1 that there are key operational variables that impact the corporate financial performance of small and medium sized construction organizations (Grades 2 to 6) in the South African construction industry. Based on the study findings presented in Table 4.22, it can be concluded that the key operational variables that impact the corporate financial performance of small and medium sized construction companies in South Africa, from industry stakeholders perspectives are technical ability, financial capacity, networking (relationship with industry stakeholders) and staff training (coaching/mentoring). Other variables such as human resource capacity and geographical spread of the company were not supported by the study results.

6.3 Recommendations and suggestions from findings

Taking into consideration the information that has been established through the review of literature and the research findings, it is evident that there are operational variables affecting construction companies that have not been fully exploited and embraced by the South African construction firms. These include technical ability, financial capacity, technical and management skills, human resource (staff size), mentoring of personnel in the organization, organizational structure, relationships with industry stake holders and geographical spread of business activities. Based on the findings of the study, a number of recommendations can be made. The first recommendations relate to the key operational variables that emerged as impacting on the financial performance of construction companies in South Africa. It would be advisable for SME construction companies to do the following:

- Improve their technical capacity, which includes the possession of plant and equipment and the effective use of it;
- Focus on improving their financial management skills and thereby their financial capacity;
- Adopt a culture of training within the organisation, so as to improve technical skills;
- Improve their relationships with industry stake holders (clients, suppliers, consultants).

Although the relationship with subcontractors was rated low by all the respondents, it is advisable that construction firms try to reinforce their relationship with subcontractors in order to produce quality work. Subcontractors handle an appreciable portion of all construction contracts in the industry. The ability of the main contractor to deliver projects within time and cost constraints, as well as the quality of delivery, depends largely on the performance of subcontractors. Therefore, long term relationships with subcontractors must be actively pursued in order to maintain quality at all times. It is also recommended that the cidb promotes and enforces a well-structured contractor development programme. This will provide a platform for providing adequate funding for basic training of contractors in the diverse skills mentioned above. The training could be used as part of the criteria for assessing and grading contractors into their respective grades, based on the level of achievement of the various skills.

Based on the findings of the research, the following can be concluded with regards to the relationship between operational variables and corporate financial performance of firms. It can be concluded that technical ability, financial capacity and networking has a significant and positive relationship with corporate financial performance of turnover and profit. Lastly, the research presents a framework in schematic form of key operational variables established from the survey that will aid the corporate performance of construction companies, as shown in Figure 6.1.

The framework shows financial capital, technical ability which is the effective use and possession of plant and equipment and networking with industry stakeholders. The framework is partly aligned with the cidb grading system which makes use of financial capital as one of the grading criteria. It shows that construction companies (especially the lower level contractors) need financial capacity in order to perform. The framework therefore suggests that a funding facility is needed in the form of loans, in order to assist construction companies to improve their financial capacity. This would yield high turnover of the construction company and hence increases its profitability. Similarly, the framework also suggests that construction companies need to have access to finance to be able to acquire plants and equipment so as to increase its competitive advantage thereby enhancing work turn over. It also suggests that networking with other industry stakeholders will help them acquire high market share which in turn will yield work turnover and hence its profitability. The more jobs contractors secure the better their turnover and profitability. Finally, the framework also suggests that if contractors are able to save part of their profit, this would assist them in having a continuous cash flow. Profitability is a performance indicator, as is turnover. Therefore profitability and high turnover of construction firms is essential for their continuous cash flow and for their corporate performance.

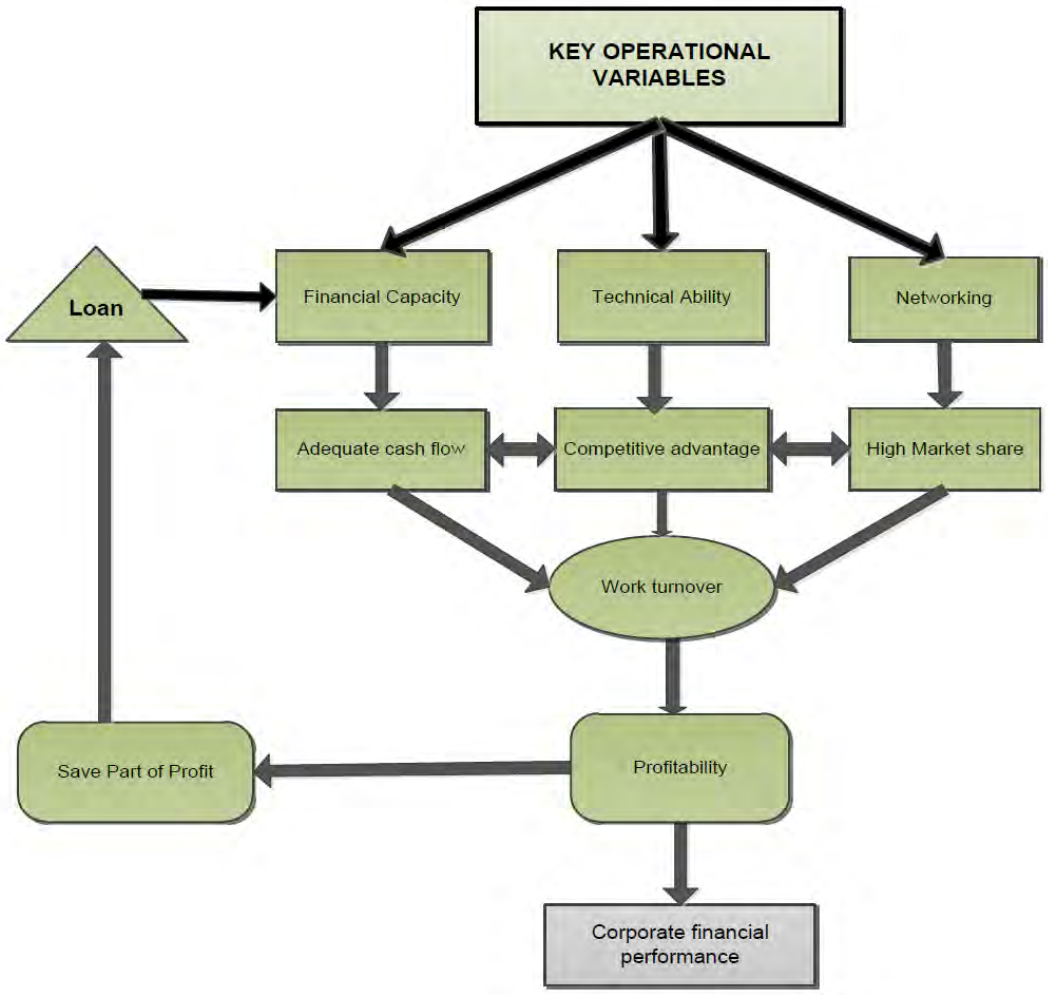


Figure 6.1: Suggested framework of operational variables of construction companies aiding corporate performance

6.4 Directions for further research

The main aim of this research was to determine the operational variables that impact on the corporate performance for SME building contractors. The findings of the study suggest a number of possible avenues that could be explored in further research.

Firstly, it would be worth investigating the specific variables that are common to contractors that help them to develop or grow in the industry.

Secondly, studies could investigate the impact of the operational variables on other performance variables used in the conceptual framework, like client satisfaction, track record, job satisfaction and market share.

Thirdly, the literature suggests that client satisfaction, track record, job satisfaction of employees and market share also impacts on the performance of construction firms. The current study did not include these variables. Further research is necessary in order to elucidate the effect of client satisfaction, track record, job satisfaction of employees and market share on construction companies' performance in South Africa.

Lastly, further studies are also needed to validate the results obtained in the current study, using different methodologies and a larger, nation-wide sample.

6.5 Closing Statement

The construction industry plays an important role in the socio-economic development of any nation. It contributes directly through the buildings and other infrastructure it produces and by generating employment. It also contributes indirectly by facilitating the growth of other industries. Based on the significant role played by the construction industry in South Africa, this research supports an increased effort in contractor development of small and medium sized construction companies by the construction industry development board in South Africa. Well-structured contractor development programmes that seek to improve the technical and managerial skills, knowledge and competitiveness of contractors will support sustainable business growth and socio-economic development as a whole. The development of technological capabilities often requires an extended learning process. The construction industry can help small and medium construction companies through this process, to enhance their capacity and capability. The recommendations of the study apply more broadly to developing countries, but particularly those in the Southern Africa. These countries are encouraged to incorporate the findings of this study into their contractor development programmes, in order to improve the capacity of construction firms.

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8. APPENDICES

8.1 Appendix A – Cover letter/Consent letter

GEORGE CYRIL TUCKER OTD Building, B.Eng. (civil option)

Department of Construction Economics and Management, University of Cape Town, Private Bag X3, Rondebosch 7701, South Africa

Email: tckgeo001@myuct.ac.za/cyriltucker07@yahoo.cim

Mobile: +27 76 161 8834,

2nd January, 2013

Dear Sir/Madam,

Subject: Questionnaire for the determination of the resilient operational variables of construction companies crucial to their corporate performance

Dear Sir/Madam,

I am presently preparing a dissertation titled "determination of the resilient operational variables of construction companies crucial to their performance in the South African construction industry" as part of my MPhil degree in construction economics and management An important element of the study is to carry out a questionnaire survey to determine the operational variables of construction companies crucial to their performance.

Based on your experience as a professional in the field of construction, I kindly request you to spare part of your time to fill in the attached questionnaire. There is no compensation for responding nor is there any known risk. In order to ensure that all information will remain confidential, please *do not* include your name. Participation is strictly voluntary and you may refuse to participate at any time. The data collected will provide useful information regarding the capacity, capability and marketing strategy which should be employed by construction companies for their performance in the construction industry.

If you would like a summary copy of this study please indicate by completing the Request for Information Form and return it to me in a separate envelope. Should you require additional information or have any questions, please contact me at the number and email address stated above.

Should you also not satisfied with the manner in which this study is being conducted; you may report any complaints to the course convener:

Dr Abimbola Windapo,
Department of Construction Economics and Management,
Centlivres Building, Upper Campus, University of Cape Town.
Tel No: +27 21 650 3443, mobile: +2773 700 5184
Email: Abimbola.Windapo@uct.ac.za

Thank you for taking the time to complete the questionnaire. Your contribution is highly appreciated.

Yours Sincerely,

George Cyril Tucker

8.2 Appendix B – Request for information

Request for Information (RFI)

(This request for information form is an optional part of the cover letter and is not required for any approval)

Please send a copy of the study results to the address listed below

……

…….

……

……

……

……

……

Please do not return this form with your survey

8.3 Appendix C – Sample of interview questions in the formative study

Sample questions that were asked during the interview

The respondents were asked what they perceived to impact on construction companies' performance generally in terms of capacity, capability and marketing strategy.

- In terms of capacity of construction firms, what kind of capacity do you perceive construction companies should possess so as to improve their performance?
- Do you think possession of construction plant and equipment and its effective use improve construction companies' performance in terms delivering quality construction work and in time?
- What's the level of the qualification of your technical and professional staff?
- Do you perceive the level of qualification of construction company staff has a great effect on company performance?
- Do you think the years of your corporate existence will have a great influence on your performance and why?
- What type of technical and management skills is being practice by your construction company generally in order to improve their performance?
- Have you ever had major accidents before when implementing construction works?
- Do you have training facilities for your staff in order to improve their technical skills so as to ensure that your company performs?
- What is the structure of your organization like?
- Is your company structured in such a way that information is being transferred easily to the least worker?
- What kind of relationship do you have with clients, consultants, suppliers, subcontractors, government departments etc.?
- Do you think that relationship with these stake holders will influence your performance directly or indirectly?

8.4 Appendix D – Questionnaire

SECTION A: GENERAL INFORMATION

Please indicate the registration grade for your company by placing a tick (√) in the box provided below.

Grade	1	2	3	4	5	6	7	8	9
Civil Engineering (CE)									
General Building (GB)									
Mechanical Engineering (ME)									
Electrical Engineering (EP or EB)									
Specialist works/other (indicate highest grade if more than one)									
Others (Please specify)									

Kindly indicate the Geographical spread of your construction business (Tick only the option that is the most applicable)

☐ Just within the Company's environment (Local)

☐ Within the province of the company (Provincial)

☐ Extends beyond the province in which the Company is headquartered (Regional)

☐ Extends to all provinces within South Africa (National)

☐ Extends outside the boarders of South Africa (International)

Please indicate your work designation or position held in your company by placing a tick (√) in the box provided below.

Owner		Director		Management Staff		Technical Staff	

Please indicate the years of corporate existence of your company by placing a tick (√) in the box provided below

1-5years		5-10years		10-15years		15-20years	

SECTION B: OPERATIONAL VARIABLES OF CONSTRUCTION COMPANIES

Please rate the influence of the following indicators used for measuring capacity in terms of technical ability that you perceive as enhancing your organization's corporate performance by placing a tick (√) against the factors in the respective boxes ranging from 1-5 in the table below: where 1=No impact 2=Low. 3= Average 4= High. 5= Very High

ITEM	FACTORS	1	2	3	4	5
1	Capacity of construction Equipment and Plant					
2	Utilization and efficiency of Equipment and Plant					
3	Maintenance of Plant and Equipment					
4	Rate of applying the new technology developed internally					
5	Number of Technical Staff					
6	Experience/knowledge of technical skill					
7	Qualification of technical staff					
8	Adequacy of Administrative Staff					

Please rate the influence of the following indicators used for measuring capacity in terms of financial ability that you perceive as enhancing your organization's corporate performance by placing a tick (√) against the factors in the respective boxes ranging from 1-5 in the table below: where 1=No impact 2=Low. 3= Average 4= High. 5= Very High

ITEM	FACTORS	1	2	3	4	5
1	Value of annual loans obtained					
2	Knowledge about financial policy					
3	Effective communication with Banker and Financial Institutions					
4	Organization's Asset Status					
5	Organization's Profit Status					
6	Organization's Debt Status					
7	Growth rate of the Organization's total Asset					
8	Growth rate of the Organization's Profit Status					
9	Capability of Loan repayment					
10	Payment to sub-contractors/suppliers on time					
11	Value of annual contract works (turnover)					

Please rate the influence of the following indicators used for measuring capacity in terms of management skills that you perceive as enhancing your organization's corporate performance by placing a tick (√) against the factors in the respective boxes ranging from 1-5 in the table below: where 1=None 2=Low. 3= Average 4= High. 5= Very High

ITEM	FACTORS	1	2	3	4	5
1	Availability and effectiveness of quality management system					
2	Number of major accidents over the past three (3) years					
3	Level of Budget/cost overrun					
4	No of contract disputes					
5	Delivery of project on time					
6	Availability and effectiveness of risk management systems					
7	Availability and competence of contract manager					
8	Effectiveness of site management					
9	Effectiveness of financial management					
10	Performance during the warranty period					

Please rate the influence of the following indicators used for measuring Capacity in terms of Human Resource that you perceive as enhancing your organization's corporate performance by placing a tick (√) against the factors in the respective boxes ranging from 1-5 in the table below: where 1=None 2=Low. 3= Average 4= High. 5= Very High

ITEM	FACTORS	1	2	3	4	5
1	Career prospect within the organization					
2	Mechanism of Staff Recruitment					
3	Existence of strategies for Human Resource development					
4	Ratio of Technical and Professional Staff in the organization to number of site operatives					
5	Appropriateness of personnel structure					

Please rate the influence of the following indicators used for measuring Capability that you perceive as enhancing your organization's corporate performance by placing a tick (√) against the factors in the respective boxes ranging from 1-5 in the table below: where 1=None 2=Low. 3= Average 4= High. 5= Very High.

ITEM	FACTORS	1	2	3	4	5
1	Availability of resources and programs for training your staff					
2	Appropriateness of Organizational structure in terms of your organizations operations					

Please rate influence of the following indicators used for measuring marketing ability that you perceive as enhancing your organization's corporate performance by placing a tick (√) against the factors in the respective boxes ranging from 1-5 in the table below: where 1=No impact 2=Low. 3= Average 4= High. 5= Very High

ITEM	FACTORS	1	2	3	4	5
1	Relationship with Governmental Departments					
2	Relationship with Private Sector Developers					
3	Relationship with News Media					
4	Relationship with Suppliers					
5	Relationship with Sub - Contractors					
6	Relationship with the Public					
7	Relationship with consultants					
8	Relationship with clients					

Please rate influence of the following indicators used for measuring marketing ability in terms of geographical spread of business activities you perceive as enhancing your organization's corporate performance by placing a tick (√) against the factors in the respective boxes ranging from 1-5 in the table below: where 1=No impact, 2=Low, 3= Average, 4= High,. 5= Very High.

Geographical spread of business activities	1		2		3		4		5	
Local										
Provincial										
Regional										
National										
International										

Kindly provide documents that will assist in documenting the performance of your company in terms of profitability:

Abridged two - five year audited financial statements/annual reports

Company organizational charts (organogram)-showing function and leadership

13. Kindly provide information on the following as indicated in the table below:

(A) Turnover: Your Organization's Turnover, for the last five years as indicated in the table below

Item	Year	Turnover/Contract Value acquired by your company in Rands
1	2009	
2	2010	
3	2011	
4	2012	
5	2013	

(B) Kindly indicate Company's Asset, liabilities and profit acquired for the last five years as indicated in the table below for the last five years

Item	Year	Name of Asset	Asset Type	Value in Rands	Own/ Hire	Liability value in Rand	Profit in Rand
1	2009						
2	2010						
3	2011						
4	2012						
5	2013						

(C) Kindly indicate the value of Annual loans obtain by your Company for the last five years.

Item	Year	Value of Annual Loans	Percentage (%) of Interest Charged on Annual Loans	Amount Repaid in Rand	Balance Payable in Rand
1	2009				
2	2010				
3	2011				
4	2012				
5	2013				

(D) Kindly indicate the value of the Annual Tax paid by your Company for the last five years.

Item	Year	Value of Tax in Rand	Value of Tax Paid	Outstanding Tax in Rand
1	2009			
2	2010			
3	2011			
4	2012			
5	2013			

8.5 Appendix E – Secondary Data

Secondary data used in the Spearman Rank Order Correlation coefficient Analysis.

S/NO	PBIT	TURNOVER	TA	NA	ROTA	ROCE	PM
1	5.48	44.38	64.86	37.89	8.45	14.46	12.34
2	2.28	32.74	8.59	15.78	26.58	14.47	6.97
3	0.76	10.44	7.62	19.00	9.94	3.99	7.26
4	5.40	296.65	71.61	34.78	7.55	15.54	1.82
5	2.55	55.79	14.56	13.76	17.51	18.53	4.57
6	6.18	98.62	16.13	9.34	38.29	66.11	6.26
7	2.28	65.00	40.93	14.12	5.58	16.17	3.51
8	3.14	41.46	13.26	6.41	23.65	48.91	7.56
9	5.40	135.77	16.96	9.35	31.84	57.78	3.98
10	0.31	65.33	3.43	2.57	8.88	11.88	0.47
11	31.68	289.78	77.20	32.86	41.04	96.42	10.93
12	112.87	564.74	434.77	118.77	25.96	95.03	19.99
13	63.77	666.98	345.14	223.91	18.48	28.48	9.56
14	26.54	55.99	56.99	145.76	46.57	18.21	47.40
15	105.32	9.79	88.98	23.72	118.37	444.05	1075.94
16	60.11	209.46	120.79	75.79	49.77	79.32	28.70
17	52.64	348.12	356.98	241.66	14.75	21.78	15.12
18	139.57	25.89	12.45	9.77	1120.75	1428.23	539.14
19	31.25	10.67	134.19	98.96	23.28	31.57	292.86
20	78.57	15.05	28.91	19.00	271.78	413.45	521.90
21	2.35	259.87	67.90	43.22	3.45	5.43	0.90
22	47.66	670.75	9.01	6.43	529.10	741.00	7.11
23	41.56	675.13	17.68	10.90	235.11	381.32	6.16
24	9.35	30.45	37.89	34.90	24.68	26.79	30.71
25	10.61	400.59	38.91	23.45	27.26	45.23	2.65
26	90.86	120.40	56.99	48.33	159.43	188.00	75.47
27	7.09	170.68	12.64	7.91	56.05	89.62	4.15
28	39.10	299.54	67.00	58.44	58.35	66.90	13.05
29	5.44	328.70	342.64	297.22	1.59	1.83	1.66
30	22.81	65.77	234.67	222.87	9.72	10.23	34.67
31	27.17	11.23	435.79	387.89	6.23	7.00	241.83
32	19.68	78.98	150.79	100.01	13.05	19.68	24.92
33	0.98	143.93	117.88	112.30	0.83	0.87	0.68

34	8.42	456.32	25.68	16.55	32.80	50.88	1.85
35	19.39	689.01	76.78	72.25	25.25	26.83	2.81
36	20.56	154.90	89.90	52.43	33.42	39.21	13.27
37	18.89	350.43	71.54	34.56	26.40	54.66	5.39
38	56.09	768.00	47.01	24.99	119.32	224.45	7.30
39	56.12	234.78	12.34	66.76	454.77	84.07	23.90
40	15.99	559.35	146.12	56.78	10.94	28.16	2.86
41	35.85	605.78	89.77	73.21	39.93	48.96	5.92
42	24.69	412.56	55.00	71.33	44.89	34.61	5.98
43	18.39	791.90	67.90	43.55	27.08	42.22	2.32
44	67.90	896.45	132.09	87.90	51.41	77.25	7.57
45	45.79	235.77	14.78	65.89	309.80	69.49	19.42
46	12.13	67.98	17.99	112.65	67.46	10.77	17.85
47	145.77	38.90	67.57	72.77	215.73	200.31	374.72
48	78.91	130.89	120.90	67.99	65.27	116.06	60.29
49	56.76	124.67	14.00	99.27	405.52	57.18	45.53
50	78.91	56.98	87.14	132.45	90.55	59.57	138.48
51	54.79	98.56	167.56	88.12	32.70	62.17	55.59
52	56.55	344.78	23.46	87.98	241.08	64.28	16.40
53	11.69	541.63	64.89	54.31	18.02	21.52	2.16
54	76.01	78.56	135.87	49.59	55.94	153.27	96.75
55	88.45	87.99	111.75	76.89	79.15	115.03	100.52
56	43.89	123.65	21.79	67.98	201.44	64.56	35.50
57	23.57	190.76	349.54	98.13	6.74	24.02	12.36
58	11.89	98.80	54.23	135.67	21.92	8.76	12.03
59	147.88	345.55	87.90	78.34	168.23	188.76	42.79
60	19.46	378.90	87.67	98.54	22.19	19.74	5.13
61	10.89	237.11	73.13	102.50	14.89	10.62	4.59
62	85.78	98.41	90.15	35.80	95.16	239.60	87.16

8.6 Appendix F – Results from the Kruskall-Wallis

Ranks

Grades of contractors		N	Mean Rank
Technical ability	2	6	14.67
	3	12	36.08
	4	15	28.17
	5	20	40.33
	6	9	22.56
	Total	62	

Test Statistics[a,b]

	Technical ability
Chi-Square	13.611
df	4
Asymp. Sig.	.009

a. Kruskal Wallis Test

b. Grouping Variable: Grades of contractors

Ranks

Grades of contractors		N	Mean Rank
Financial capacity	2	6	27.08
	3	12	37.04
	4	15	38.37
	5	20	28.58
	6	9	22.11
	Total	62	

Test Statistics[a,b]

	Financial capacity
Chi-Square	6.666
df	4
Asymp. Sig.	.155

a. Kruskal Wallis Test

b. Grouping Variable: Grades of contractors

Ranks

Grades of contractors		N	Mean Rank
Technical & man agent skills	2	6	24.83
	3	12	30.08
	4	15	38.67
	5	20	35.03
	6	9	18.06
	Total	62	

Test Statistics[a,b]

	Technical & man agent skills
Chi-Square	9.240
df	4
Asymp. Sig.	.055

a. Kruskal Wallis Test

b. Grouping Variable: Grades of contractors

Ranks

Grades of contractors		N	Mean Rank
Human Resource	2	6	20.58
	3	12	34.25
	4	15	40.97
	5	20	27.18
	6	9	28.94
	Total	62	

Test Statistics[a,b]

	Human Resources
Chi-Square	7.964
df	4
Asymp. Sig.	.093

a. Kruskal Wallis Test

b. Grouping Variable: Grades of contractors

Ranks

Grades of contractors		N	Mean Rank
GEOSPR	2	6	36.83
	3	12	35.13
	4	15	34.90
	5	20	28.25
	6	9	24.67
	Total	62	

Test Statistics[a,b]

	GEOSPR
Chi-Square	3.578
df	4
Asymp. Sig.	.466

a. Kruskal Wallis Test

b. Grouping Variable: Grades of contractors

Ranks

Grades of contractors		N	Mean Rank
NETW	2	6	22.50
	3	12	31.04
	4	15	26.73
	5	20	39.83
	6	9	27.56
	Total	62	

Test Statistics[a,b]

	NETW
Chi-Square	7.366
df	4
Asymp. Sig.	.118

a. Kruskal Wallis Test

b. Grouping Variable: Grades of contractors

Ranks

Grades of contractors		N	Mean Rank
ORGSTRU	2	6	36.00
	3	12	37.29
	4	15	36.7
	5	20	26.25
	6	9	23.78
	Total	62	

Test Statistics[a,b]

	ORGSTRU
Chi-Square	7.927
df	4
Asymp. Sig.	.094

a. Kruskal Wallis Test

b. Grouping Variable: Grades of contractors

Ranks

Grades of contractors		N	Mean Rank
Coaching	2	6	30.17
	3	12	37.33
	4	15	26.83
	5	20	32.40
	6	9	30.39
	Total	62	

Test Statistics[a,b]

	Coaching
Chi-Square	2.738
df	4
Asymp. Sig.	.603

a. Kruskal Wallis Test

b. Grouping Variable: Grades of contractors