

DURBAN UNIVERSITY OF TECHNOLOGY

**RISK FACTORS INFLUENCING INFORMAL CONTRACTORS'
OPERATIONS IN THE CONSTRUCTION INDUSTRY IN SELECTED LOCAL
MUNICIPALITIES OF THE FREE STATE PROVINCE, SOUTH AFRICA.**

Kelehile Joseph Motlhale

AUGUST 2024



**RISK FACTORS INFLUENCING INFORMAL CONTRACTORS’
OPERATIONS IN THE CONSTRUCTION INDUSTRY IN SELECTED LOCAL
MUNICIPALITIES OF THE FREE STATE PROVINCE, SOUTH AFRICA.**

Submitted in fulfilment of the requirements of the
degree of Doctor of Philosophy in Management Sciences

Specialising in

Business Administration

in the

Faculty of Management Sciences

at the Durban University of Technology

KELEHILE JOSEPH MOTLHALE

AUGUST 2024

APPROVED FOR FINAL SUBMISSION

Supervisor (Affiliation): _____ (signature) _____ Date: 8 August 2024

Co-Supervisor (Affiliation): _____ (signature) _____ Date: _____

ABSTRACT

Operations by informal contractors in the construction industry plays an indispensable role in informal economy of South Africa. However, several risk factors have continued to influence the successful operations of informal contractor in the construction industry of South Africa. This study therefore assesses the risk factors that influence informal contractors' operations in the construction industry. A comprehensive literature backed by different but related theories such as the dualists, the structuralists, and the voluntarists theories were sought to ascertain the risk factors that impede industry's operations throughout the project life cycle. A convergence of mixed methods approach was employed to gather concurrent data through several multiple sources. A 5 Likert-scale questionnaire and interview schedule were distributed to 304 informal contractors to gather primary data. To ensure enough triangulation data process, 18 informal contractors divided into 3 groups of 6 participants per group participated in focus group discussions (FGDs) from 8 local municipalities (LMs). Qualitative and quantitative data were analysed through SPSS statistical software aided by descriptive and inferential tools supported by ANOVA to test formulated hypotheses. Qualitative data on the other hand, was analysed using the thematic approach. Themes and sub-themes were derived from the participants' responses for meaningful inferences. The study revealed several risk factors such as project design, financial, material, decision making, physical and environmental risks among others that influence informal contractors' operations in the construction industry. It was established that though majority of informal contractors attained minimum educational qualifications, yet they lack the requisite risk management knowledge within the construction industry. Risk factors such as project design, financial, materials and decision-making processes within the construction industry. Based on the study outcomes, it was concluded that informal contractors should reduce the impact of all forms of risk factors within the construction industry. To ensure maximum reduction of risk factors in the industry, this study suggests an integrated risk factor identification framework (IRFIF) to be applied by informal contractors during project operations. In general, the use of the IRFIF framework provides beneficial for informal contractors across the informal economy. The IRFIF serves as a strategic tool that is suggested to assist informal contractors to conduct an early identification of the risk factors during operations to mitigate the occurrence of possible risk factors in the industry.

Keywords: Informal contractors, informal economy, construction industry, Integrated risk factor identification framework (IRFIF).

DECLARATION

I, Kelehile Joseph Motlhale, student number 21650120 affirm that the thesis “*risk factors influencing informal contractors in the construction industry in selected municipalities of the Free State Province, South Africa*” is my own survey in content as such, all the sources applied throughout this survey were my own work.

Kelehile Joseph Motlhale

Date: 16/11/2023

DEDICATION

I dedicate this academic work to the following family members.

- My heartiest words to the love of my life, beloved wife Suzan “Makamogelo” Ouma Motlhale ngwetsi ya Barolong for the unconditional love, support, words of encouragement you have given me through to the completion of this thesis thank you my person with lots of love.
- My children.
- To my beloved team and family members of Tshika e Motlhale Barolong Bo Mmina tshipi tholo, my humble gratitude’s to the Almighty God for blessing me with your lives many thanks for your countless messages, Phone calls words of encouragements.
- My brother-in-law and his family Mr. and Mrs. Motitimi.
- My dear brother George” Pablo” and your lovely wife Morongwe Pinky “*kgaitsemi ya ka*” and your two beautiful sons Katleho and Lebohang, thanks for always welcoming me at your home during my sessions meetings with Professor and some other related academic activities. Thank you very much for your kindness and love.
- My late parents, Mr. Serame Daniel “*Double D*” and Mrs. Seapei Welheminah “*Maitumeleng*” Motlhale.
- The late Mr. Mokitlane B. Mashabe.
- The late Mr. Petrus and Mrs. Mamorwesi Mapeka.
- The late Mr. Joseph and Mrs. Lenah Tsunke.

ACKNOWLEDGEMENTS

- Almighty *God of St Engenas*, thank you lord for your mercy, guidance also affording me the golden gift of life strength, hope and opportunity in the darkest moments. Dear lord you have walked me through imaginable trying challenging times, trials, and tribulations but I came through because of your love, you have been there with me every step of my Academic journey of this thesis. God's time is the perfect time.
- My deepest and heartfelt gratitude's to the most highly disciplined, yet humble and supportive supervisor Professor Albert Tchev Agbenyegah. Thank you very much for your continuous guidance throughout this difficult and challenging academic journey. You encouraged me and lifted me up when I was about to give up and allowed me to network with other colleagues. Our long phone, video calls, unending meetings and endless trips to Pietermaritzburg have now bears positive results. Your sacrifices are dearly and greatly adored from the bottom of my heart. I could not have wished for one of the motivating supervisors during this academic and demanding journey. Your critics, tough and at times harsh remarks made me a better and resilient person over the four years journey to acquire my thesis.....a big thanks, may God Almighty bless and protect you.
- My appreciation to the Political and Administrative leadership of Tokologo Local Municipality as my former employer, councillors, and all colleagues of the institution for granting me the opportunity to further my studies.
- Thank you Mr. Vuyani Kheshiwe for assisting when I was attending workshop in Durban. I highly appreciated your support "mfanaka". Mr. Mpho Sehloho thank you for your immense contribution towards my studies, thank you and God bless you all.
- I wish to express a word of appreciation to Dr Edwin Mohatlane for rendering your services to assist me by converting or translating thesis questionnaires from English to South Sotho, thank you very much Sir, "*le ka moso*".
- Dr Samson Tshabalala, I forever owe you for the services of advice you gave me. What a humble, down to earth person, your efforts, contributions, and support will not go unnoticed, you have really played an immense role to help me on the journey to a successful completion of my thesis thank you Sir.
- My thanks go to Dr Mpho Ramoliki Molokoane my former colleague in the public service, your kindness and willingness to really go extra mile to assist me organizes

participants for my thesis for the data collection thank you very much my dear brother, let the doors of heaven continues to shower you with blessings forever.

- Thank, Mr. Thapelo J. Moletsane “*mfanaka*” for travelling with me the lengths and breadth of the Free State Province, from early mornings to late at night to collect data and conduct interviews. May the Almighty God of ***St Engenas*** bless you in all your endeavors.
- My appreciation to Mr Khedamile Kenneth Santi, for the unwavering support during also on the collection of data and driving with me to some participants, Modimo ke oo.

LIST OF TABLES

- Table 2.1: 15th ICLS definition of informal employment
- Table 2.2: Informal employment of different economic sectors.
- Table 2.3: Provincial employment statistics.
- Table 3.1: Risk factors of the construction industry.
- Table 3.2: Risk factors from empirical studies.
- Table 3.3: Classification of risk and risk factors.
- Table 3.4: Summary of different risk factors
- Table 3.5: Characteristics of construction projects
- Table 3.6: Contractor grading designation of registered contractors.
- Table 3.7: Costs of poor risk management.
- Table 4.1: Summary of differences between qualitative and quantitative approaches.
- Table 4.2: Table illustrating the target population and sample size.
- Table 4.3: Descriptions of a 5-point Likert Scale questionnaire.
- Table 5.1: Results of the reliability analysis.
- Table 5.2: Frequency distributions responses of informal contractors
- Table 5.3: Frequency distributions of informal contractors' responses to the statements
- Table 5.4: Frequency distributions of informal contractors' responses to the statements
- Table 5.5: Frequency distributions of informal contractors' responses to the statements
- Table 5.6: Frequency distributions of informal contractors' responses to the statements
- Table 5.7: Frequency distributions of informal contractors' responses to the statements
- Table 5.8: Frequency distributions of informal contractors' responses to the statements
- Table 5.9: Frequency distributions of informal contractors' responses to the statements
- Table 5.10: Frequency distributions of informal contractors' responses to the statements
- Table 5.11: Frequency distributions of informal contractors' responses to the statements
- Table 5.12: Frequency distributions of informal contractors' responses to the statements
- Table 5.13: Frequency distributions of informal contractors' responses to the statements
- Table 5.14: Frequency distributions of informal contractors' responses to the statements
- Table 5.15: Frequency distributions of informal contractors' responses to the statements
- Table 5.16: Impact of management risk factors at different levels of the likelihood of management risk factors.
- Table 5.17: Impact of project design risk factors at different levels of the likelihood of project design risk factors.
- Table 5.18: Impact of financial risk factors at different levels of the likelihood of financial risk factors.
- Table 5.19: Impact of materials risk factors at different levels of the likelihood of material risk factors.
- Table 5.20: Impact of the project equipment risk factors at different levels of the likelihood of project equipment risk factors.
- Table 5.21: Impact of management risk factors at different levels of the likelihood of management risk factors.
- Table 5.22: Impact of the external environment risk factors at different levels of the likelihood of external environmental risk factors.
- Table 5.23: Analysis of variance (ANOVA) test.
- Table 5.24: Analysis of variance (ANOVA) test.
- Table 5.25: Analysis of variance (ANOVA) test.
- Table 5.26: Analysis of variance (ANOVA) test.
- Table 5.27: Analysis of variance (ANOVA) test.
- Table 5.28: Analysis of variance (ANOVA) test.

Table 5.29: Analysis of variance (ANOVA) test.

Table 5.30: Summary of the outcomes of formulated research hypotheses.

Table 5.31: Demography and CIDB grading distributions.

Table 5.32: Themes and sub-themes that emerged from informal contractors.

:

LIST OF FIGURES.

- Figure 1.1: Free State Province, district, and local municipalities
- Figure 2.1: The dualist models.
- Figure 2.2: Underground model of economic activities.
- Figure 2.3: Informal economic activities.
- Figure 2.4: Integrated economic activities of formal and informal and informal economy.
- Figure 3.1: Six key dimensions of risk factors impacting project operations.
- Figure 3.2: Different sources of project risks.
- Figure 3.3: The process of risk management.
- Figure 3.4: Construction risks
- Figure 3.5: Conceptual framework
- Figure 4.1: Exploratory design of mixed method procedures.
- Figure 5.1: Ownership of construction firm.
- Figure 5.2: Gender composition of informal contractors.
- Figure 5.3: Level of education of informal contractors.
- Figure 5.4: Age distributions of informal contractors.
- Figure 5.5: Marital status of informal contractors.
- Figure 5.6: Business registration by informal contractors.
- Figure 5.7: Years of experience as informal contractors.

TABLE OF CONTENTS

ABSTRACT	i
DECLARATION OF ORIGINALITY	ii
ACKNOWLEDGEMENTS	iii
LIST OF TABLES	iv
LIST OF FIGURES	vii
TABLE OF CONTENT	viii
LIST OF ACRONYMS	vx

CHAPTER ONE: INTRODUCTION AND BACKGROUND OF THE STUDY

1.1	Introduction and background of the study	1
1.2	Background of the study	2
1.3	Research problem	3
1.4	Study aims and objectives	4
1.4.1	Study objectives	4
1.5	Research questions	4
1.6	Hypotheses	5
1.7	Relevance of the study	6
1.8.	Conceptualising risk	7
1.8.1	Risk factors in the construction industry	7
1.8.2	Characteristics and nature of informal economy	8
1.9	Scope of the study	8
1.10	Research Methodology	9
1.10.1	Outline of the research design and methodology	9
1.10.2	Target population	9
1.10.3	Sampling technique	10

1.11	Overview of the study areas	10
1.12	Operational definitions of key concepts	12
1.12.1	Research participants	12
1.12.2	Contractors	12
1.12.3	Informal Contractors	13
1.12.4	The construction industry	13
1.12.5	Risk factors in the construction industry	13
1.13	Delimitations of the study	14
1.14	Structure of the thesis	14
1.15	Conclusion	15

CHAPTER TWO: LITERATURE ON THEORETICAL PERSPECTIVES OF INFORMAL ECONOMY.

2.1	Introduction	17
2.2	Theoretical perspectives of informal economy	18
2.2.1	The dualist views	18
2.2.2	The structuralist views	20
2.2.3	Voluntarists theory	21
2.3	Historical overview of informal economy	22
2.4	The nature and characteristics of informal economy	24
2.5	Conceptualising informal economy	26
2.6	Defining informal economy: ILO definition	27
2.7	Formal and Informal contractors	28
2.8	Informal economy of South Africa	28
2.9	Informal economic activities of distributions in South Africa	29
2.10	The nature of informal economy in global context	30
2.11	Overview of Informality and poverty	31
2.12	Reasons for the negative impact of informal economy	32
2.13	A depiction of the characteristics and conceptualization of informality	33
2.14	The formal and informal economy: The linkages	34
2.15	Growth impediments in informal economy	35
2.15.1	Harsh regulatory working climate	36
2.15.2	Other research gaps	36
2.15.3	Infrastructure difficulties	37

2.15.4	High crime rates	37
2.15.5	Lack of access to funding	38
2.15.6	Lack of business training	38
2.16	Informal workforce profile and characteristics	39
2.17	Informal economy's cyclical relationships to formal economy	40
2.18	Conclusion	41

CHAPTER THREE: THEORETICAL AND CONCEPTUAL FRAMEWORK

3.1	Introduction	42
3.2	Theoretical framework	42
3.2.1	Organisational theory	42
3.2.2	The theory of financing stress	43
3.2.3	The shareholder value of maximisation theory	44
3.2.4	Agency theory	44
3.2.5	Institutional theory	45
3.2.6	Contingency theory in the context of risk management	45
3.2.7	The fuzzy theory	46
3.3	Conceptual Framework	47
3.3.1	Risk and risk factors	47
3.3.2	Defining the concept of risk	47
3.4	The general perspectives of risk	49
3.5	Empirical study on risk and risk management in different countries	49
3.6	Overview of risk factors	50
3.7	Sources of risk	55
3.7.1	Opportunity-based risks	56
3.7.2	Uncertainty-based risk	56
3.7.3	Hazard-based risks	56
3.8	Risk factors from Empirical	57
3.9	Classification of risks	58
3.10	Overview of empirical study of risk factors in the construction industry	59
3.11	Important risk factors impacting the Construction Industry	61
3.11.1	Delays of Construction Industry	63
3.11.2	Price Fluctuation of Construction materials	64
3.12	Project Risk Management in the Construction Industry	65
3.12.1	Risk Identification	66
3.12.2	Assessment of Project Risks	66

3.12.3	Communication	67
3.12.4	Project risk monitoring phase	67
3.13	South African economy and the construction industry	68
3.14	Historical foundation of the South African Construction Industry	70
3.15	Nature of construction activities and risks	71
3.16	Contributions of the construction industry in South Africa	72
3.17	Outline of challenges in the construction industry	73
3.17.1	Capacity and skills shortages	73
3.17.2	Access to work volume	74
3.17.3	Access to finance	74
3.17.4	Corruption, Maladministration and fraud	75
3.17.5	Practices of “fronting”	75
3.18	The Construction Industry Development Board (CIDB)	76
3.18.1	The Construction Charter	78
3.18.2	Grading requirements of the construction Industry	79
3.19	Historical perspectives of risk Management of Construction Projects	79
3.19.1	Nature of project risk management in the construction industry	81
3.20	Global Perspectives of risk management in the construction industry	82
3.21	State of South African Risk Management in the Construction Industry	83
3.22	Construction risk	84
3.23	Causes of project delays in the construction industry	85
3.24	Impact of poor risk management within the Chinese construction Industry	87
3.25	Other impacting factors due to poor project management	87
3.26	Construction Industry challenges of management risk	89
3.26.1	Limited Insurance Policy	89
3.26.2	Insufficient information prediction	89
3.26.3	No efficient process of risk assessment	90
3.26.4	Inability to be transparent and accountable	90
3.26.5	Impact of poor project risk management on the construction industry	91
3.26.6	Project costs overgrowth	91
3.26.7	Project delays and failures	92
3.27	Cost implications for poor risk management in the construction industry	92

3.28	Conceptual framework	94
3.29	Conclusion	95

CHAPTER FOUR: RESEARCH METHODOLOGY

4.1	Introduction	96
4.2	Research Approach	97
4.2.1	The concept of Ontology	97
4.2.2	Epistemology	97
4.2.3	Axiology	98
4.3	Research design	99
4.4	Quantitative approach	100
4.5	Qualitative approach	101
4.6	Motivation for using qualitative and quantitative research approaches	103
4.7	Justification for using qualitative and quantitative approaches	103
4.8	Triangulation approach	104
4.9	Research population	105
4.10	Sampling Strategy	106
4.11	Sample size	107
4.12	Collecting qualitative data for analysis	108
4.12.1	Focus Group Discussion (FGDs)	109
4.13	Design of research interview	110
4.13.1	Interview guide and construction of interview questions	111
4.14	Gathering qualitative data	112
4.15	Qualitative data analysis	114
4.15.1	Trustworthiness of qualitative data	115
4.16	Ethical considerations	117
4.17	Pilot study	118
4.18	Quantitative measuring Instrument	118
4.18.1	Quantitative instrumentation	119
4.18.2	Administration of quantitative instrument	120
4.19	Analysis of quantitative data	121
4.19.1	Quantitative data interpretation	122
4.19.2	Test of analysis of variance (ANOVA)	123
4.20	Reliability and validity of quantitative data	123

4.21	Conclusion	124.
------	------------	------

CHAPTER FIVE: RESULTS AND INTERPRETATIONS

5.1	Introduction	125
5.2	Research aims and objectives	125
5.3	Research Instruments	126
5.3.1	The rate of response	127
5.4	Empirical findings	128
5.4.1	The approaches used for descriptive and thematic data set	129
5.4.2	Descriptive statistics	129
5.4.2.1	Business Ownership	130
5.4.2.2	Gender composition of Informal contractors	130
5.4.2.3	Level of education of Informal contractors	131
5.4.2.4	Age composition of Informal contractors	132
5.4.2.5	Marital status of Informal contractors	133
5.4.2.6	Business registration of informal contractors	134
5.4.2.7	Years of experience as informal contractors	135
5.4.2.8	Frequency distributions of responses	136
5.4.2.9	Identification of risk factors that impact operations of informal contractors	137
5.4.2.10	Perceived occurrence of operational risk factors of management	139
5.4.2.11	Identification of risk factors of project design	141
5.4.2.12	Perceived occurrence of risk factors of project design	143
5.4.2.13	Identification of risk factors of finance	145
5.4.2.14	Perceived occurrence of operational financial risk factors	146
5.4.2.15	Identification of the risk factors of materials	147
5.4.2.16	Perceived occurrence of operational activities related to materials	150
5.4.2.17	Identification of risk factors of project equipment	152
5.4.2.18	Perceived occurrence of operational activities related to project equipment	153
5.4.2.19	Identification of the risk factors related to labour	154
5.4.2.20	Perceived occurrence of operational activities related to labour	156
5.4.2.21	Identification of the risk factors of external environment	158
5.4.2.22	Perceived occurrence of operational risk factors favourable to ext. environment	160

5.4.3	Descriptive for mean and standard deviation	162
5.4.4	Inferential analysis	165
5.4.5	Qualitative data analysis	171
5.4.6	Qualitative data presentations	172
5.5	Conclusion	191

CHAPTER SIX: SUMMARY OF THE STUDY, DISCUSSIONS, RECOMMENDATIONS AND CONCLUSION

6.1	Introduction	192
6.2	Summary of empirical study	193
6.3	Overall conclusion of this empirical study	194
6.4	Key findings of the thesis	198
6.4.1	Major quantitative outcomes	198
6.4.2	Major qualitative outcomes	199
6.4.3	Conclusions relative to the research hypotheses	203
6.4.4	Developing an integrated risk factor identification framework (IRFIF) to enhance Operations in the construction industry	205
6.4.5	The strength, limitations and impediments of the empirical study	209
6.4.6	Recommendations to the districts and local authorities	210
6.4.7	Contributions of the study	211
6.4.8	Recommendations for further empirical study	211
6.4.9	Conclusion	212

References

LIST OF ACRONYMS

ANOVA	Analysis of variance
ASGISA	Accelerated and shared growth initiative of South Africa
CII	Construction Industry Institute
CIDB	Construction Industry Development Board
DMS	District Municipalities.
DTI	Department of Trade and Industry
FGDS	Focus group discussions.
FSB	Free State Board
FSP	Free State Province
GDP	Gross Domestic Product
GNI	Gross National Income
ICLS	International Conference of Labour Statistics.
ILO	International Labour Organisation.
IMAs	Institute of Management Accountants.
ISO	International Organisation for Standardisation.
IRFIF	Integrated Risk Factor Identification Framework
LMs	Local Municipalities.
PICC	Presidential Infrastructure Coordination
PMBOK	Project Management Body of Knowledge.
PMI	Project Management Institute.
PWC	Price Waterhouse Coopers
SAFIM	South African Formal-Informal Model
SALGA	South African Local Government Association.
SARB	South African Reserve Bank
SPSS	Statistical Packages for Social Sciences Software.
UNCHS	United Nations Centre for Human Settlement.



CHAPTER ONE

INTRODUCTION AND BACKGROUND OF THE STUDY

1.1 Introduction

The Construction Industry serves as the primary contributor to economic growth in terms of employment of the World's working class including the artisans and engineers (Nieuwenkamp, 2016). According to the study, the industry provides employment opportunities to 180 million working class that account for 13% of the Global Domestic Product (GDP) by 2020. In South Africa the industry creates job opportunities for 1,395,000 people across the formal and informal economy to the value of 39% of the National Gross Domestic Product (NGDP) (Statistics South Africa, 2017). Despite its socio-economic contributions, the construction industry is highly risky during project operations because of the harsh working conditions and different phases of project life cycle (Gao, Sung & Zhang, 2013). Besides, the industry consists of broader decision-making processes making it more complex that culminates in high levels of uncertainties and significant risky operations (Kuhn, 2014). Furthermore, project scope, schedule and budget are likely to change due to the risky nature of project operations (Nieto-Morote & Ruz-Vila, 2011; Clark, 2016).

Daily human activities involve risks. As such, every risk is of utmost concern since it is about lack of predictability and uncertainty. The construction industry is the primary contributor to employment new housing projects, infrastructure building in the economy, maintenance of existing structures in the economy (Yusof et al, 2016; De Araujo et al, 2017). Despite its socio-economic contributions, the industry is riskier, very effective and difficult to operate (Ehsan et al, 2010; Hwang et al., 2017; Iqbal et al., 2015; Hanna et al., 2013). The industry is highly characterized by inputs of high funding, processes and procedures that are complex, operate in harsh economic climatic conditions and projects based on longer periods (Ziyu et al., 2017;

Panthi et al., 2009; Sears et al., 2015). Given the organizational characteristics of the industry, its operation is mainly found in high risk working climate that consists of several uncertainties that are associated with weather conditions, location of the industry, issues of communication and local regulatory framework (Zarrouk et al., 2017; Al Mousli & EL-Sayegh, 2016; Akanni et al., 2015). Risk control measures enable the creation of favourable working conditions that further leads to successful industry activities (Szymanski, 2017; Cooper et al., 2014; Dey, 2009). There have been several significant challenges of risk factors that impede operations of the construction industry (Mbande, 2010; Milford, 2010; Tomlinson, 2010).

Though these challenges are known to occur in the formal economy, no evidence is known that the challenges influence the construction industry in informal economy. Besides, due to lack of definite assessment tools to identify every risk factor during construction of projects, it is important that individual contractors continue to play their part in the construction industry to try and identify the risk factors. The general lack of specific tools especially in informal economy cannot be ignored given the study areas where there is growing rurality. This study is designed to fill the existing gap by proposing an integrated risk factor identification framework (IRFIF).

1.2 Background of the study

Many small contractors operating in informal economy largely remain dependent on specific “*rules of thumb*” to conduct assessments and analyse various risk factors within the construction industry. By its nature, the construction industry entails stakeholders that are linked to different construction projects (Chatterjee, Zavads, Tamosaitiene, Adhikary & Kar, 2018). These construction projects are likely to experience countless internal and external risks factors of high proportion (Choi, Mogyoro & Pehrsson, 2011). Besides, scientists have for years identified numerous risk factors that impact the construction industries (Razakhani, 2012; Enshasi & Mosa, 2008). The study outlined and grouped in general the risk factors depending on the possible risk factors that are likely to impact the industry and informal contractors. Risk factors according to scientific evidence are dependent on factors such as physical, environmental, contractual, financial, legal, natural, political, safety and delay risks (Wiguna, Scot & Khosrowshahi, 2005).

Recent projects that were linked to construction bears the necessary hallmarks that are very complex due to different related project activities (Chatterjee et al, 2018; Wang, Dulaimi & Aguria, 2004). The construction industry is open to varying impediments that are known as risks (Salah & Moselhi, 2016). Depending on the specific construction approach, potential risks are characterized as events that impact the primary aims of projects in terms of time, costs, and project quality (PMBOK). Identifying typical projects risk categories are defined as approaches used to recognize and save information that corresponds to construction industries in general.

Effectively the total output of the industry is estimated to be over R100 billion and 17.9% of the country's GDP (SARB, 2006). Furthermore, the construction industry employs more than 23000 firms which mostly consist of small contractors. The bulk of small construction firms are registered with the Construction Industry Development Board (CIDB). Though the construction activities are very complex, each project is highly predisposed to various forms of risk (Olamiwale, 2014). Based on the government investment policy in infrastructure such as energy and transportation, the construction industry continues to play significant roles. This partnership is in line with government expansion agenda aided by the Accelerated and Shared Growth Initiative of South Africa (ASGISA) (Robert, 2006; DTI; 2006). In line with the above programme, it is expected that the Construction Industry increase the existing level of output to augment available government initiatives (Creamer, 2005).

Existing studies that investigated risk factors in the formal economy revealed lack of conclusive reports on risk factors in the construction industry across the globe (Pehlivan & Oztemir, 2015; Katre & Ghaitidak, 2016). Several other studies by Garrido, Ruotolo, Ribeiro and Naked (2011) and Tadayon, Jaafar and Nasri (2012) were undertaken to identify risks that include previous project information, the general technical expertise, group dynamics and personal contacts. According to Chihuri and Pretorius (2010), all the methods applied throughout the previous studies were inconsistent rather these methods agreed with the study of Garrido et al (2011) regarding different risk factors. Similar studies were assessed not to be extensive. For instance, a study by authors in which risk factors were classified from 2008 to 2016 across different context (Mahendra, Pitroda & Bhavsar, 2013; Nieto-Morote & Ruz-Vila, 2011). This study is designed to explore and identify the risk factors that impact operations in informal economy of informal contractors.

1.3 Research problem

Informal contractors operating in informal economy have not understood the impact of the various risks factors such as project design, financial, material, decision making, physical and environmental risks. Thus, they are unable to handle the various risks that constrain every operation in the industry (Makombo, 2011). All project risks need to be identified to enable the construction projects to be successful in achieving set objectives (Sanchez et al, 2008). Within the industry, the informal contractors find it very difficult to comprehend the various risk factors such as project design, financial, material, decision making, physical and environmental risks among others that impact successful operations (Schieg, 2010). In comparison to other small businesses, the construction industry is faced with growing risks challenges (Zou, Zhang & Wang, 2011; Schieg, 2010). Based on the uniqueness and the complex nature of construction risks such as financial, delay, environmental and physical risks among others, it is critical that all the contributing factors of risks be identified. Identifying the factors of risks within the construction industry is the greatest enabler to the survival of the industry. Recent PICC Report (2012) showed that many mega construction projects have failed in the past to achieve set objectives. Based on the difficulties in the construction industry it is vital to commission more empirical research to identify the factors of risk and their impact on the industry.

1.4 STUDY AIMS AND OBJECTIVES

The aim of the study is to explore the risk factors influencing informal contractors' operations in the construction industry in the selected local municipalities of the Free State Province.

1.4.1 Study Objectives

- To establish the risk factors of informal contractors in the construction industry in the Free State Province.
- To examine the nature of risk factors in the construction industry in the Free State Province.
- To identify the significance of the sources of risk factors in the construction industry in the Free State Province.
- To evaluate the types of risk factors that impede operations of informal contractors in the Free State Province.
- To develop an integrated risk factor identification framework (IRFIF) to enhance operations of the construction industry in the Free State Province.

1.5 RESEARCH QUESTIONS

- What are the risk factors of informal contractors in the construction industry in the Free State Province?
- What is the nature of risk factors in the construction industry in the Free State Province?
- What are the significant sources of risk factors in the construction industry in the Free State Province?
- What types of risk factors impede operations of informal contractors in the construction industry in the Free State Province?
- What are the integrated risk factor identification framework (IRFIF) that could enhance operations in the construction industry?

1.6 HYPOTHESES

The concept of hypotheses is explained as a tentative response to a scientific study that is aimed at addressing a problem that is scientifically tested (Cooper & Schindler, 2014). According to scientist Brannen (2017), for the hypotheses to be tested the researcher is expected to provide an identification of a variable, character or a descriptor within a research sampling unit that has effect, causes or influence on specific variable or descriptor of the sampling unit. Leedy and Ormrod (2010) further add that the character and descriptor of any form of variable that influence the sampling units or other variables as the independent variable while the variable, character or the identified descriptor that is influenced by an independent variable is referred to as the dependent variable (Kumar, 2019). The following null (H_n) and the alternate (H_a) hypotheses are formulated to be tested.

$H1_N$: The level of likelihood of management risk factors has no significant effect on the impact of management related risk factors.

$H1_A$: The level of likelihood of management risk factors has a significant effect on the impact of management related risk factors.

$H2_N$: The level of likelihood of project design risk factors has no significant effect on the impact of project design risk factors.

$H2_A$: The level of likelihood of project design risk factors has a significant effect on the impact of project design risk factors.

$H3_N$: The level of likelihood of financial risk factors has no significant effect on the impact of financial risk factors.

$H3_A$: The level of likelihood of financial risk factors has a significant effect on the impact of financial risk factors.

$H4_N$: The level of the likelihood of material risk factors has no significant effect on the impact of material related risk factors.

$H4_A$: The level of the likelihood of material risk factors has a significant effect on the impact of material related risk factors.

$H5_N$: The level of the likelihood of project equipment risk factors has no significant effect on the impact of project equipment related risk factors.

$H5_A$: The level of the likelihood of project equipment risk factors has a significant effect on the impact of project equipment related risk factors.

H6_N: The level of the likelihood of labour risk factors has no significant effect on the impact of labour related risk factors.

H6_A: The level of the likelihood of labour risk factors has a significant effect on the impact of labour related risk factors.

H7_N: The level of the likelihood of external environment risk factors has no significant effect on the impact of external environment related risk factors.

H7_A: The level of the likelihood of external environment risk factors has a significant effect on the impact of external environment related risk factors.

1.7 Relevance of the study

This empirical study closes an existing research gap and further addresses the growing dearth of study on the influence of risk factors of the construction industry in informal economy in particular informal contractors from selected local municipalities of the Free State Province. The author of this study believes that understanding the influence of the various risk factors within the informal contractors in the local municipalities of the selected municipalities will open better job opportunities for informal contractors who resides and engage in construction activities to improve their livelihood. This empirical study is valuable because it will extend the knowledge frontier and offer theoretical contributions to informal contractors in the selected LMs.

1.8. Conceptualizing risk

Any form of potential threat that impacts on a successful project is referred to as risk (Barber, 2005). Risk is further defined to mean more than financial loss. According to Abassi, Abdel-Jaber and Abu-Khajedart (2005), risk can be classified as probability of loss, setback, destruction or even injury among others. Risk represents the likelihood of past experiences within a given setting under the management capability of a decision-maker (Al-Salman, 2004). Any risk factor is therefore defined as a claim by the investor for the failure of construction activities that fail to achieve agreed objectives (Warszawski & Sacks, 2004). The risk is that existing knowledge gap that constitutes a project threat (Cledon, 2009). Further argument by Darnall and Preston (2010) argued that risk is any predictable event that can be easily identified prior to its occurrence.

On the other hand, uncertainty is the possibility of any chance that occur of specific eventuality (Smith et al, 2014). According to Flanagan (1993), any form of uncertainty that is considered through decision making with prior data that can be used to point to the likelihood of future occurrence. While some scientists are likely to differentiate uncertainty from risk, others are of the view that uncertainty and risk are synonymous (Flanagan, 1993). Though risk and uncertainty are twin concepts, several researchers can provide enough dissimilarities between the concepts (Samson, 2009). Lester (2007) describes risk as the total combinations of probable events and accompanying results. Uncertainty can be caused by many factors. For example, the factors of unforeseen and unknown risks that occur in projects construction produces more degree of uncertainty to estimate cost budgets.

1.8.1 Risk factors in the construction industry

The construction industry is largely risky as compared to other businesses as every construction project displays a unique approach. Therefore, every risk within the industry needs consideration where projects could be positively or negatively impacted (Al-Rousan, Sulaiman & Salam, 2010). Different academics and researchers have identified various risk factors within construction projects in previous empirical studies (Enshassi, Sawalhi & Radwan, 2003). For instance, as study by Fumo and Jabbour (2011) have indicated that most risks are known to surface during the project design phase. Risk management within the construction industry is another vital area of decision-making during project operations (Tang et al, 2007). Managing risk is indispensable to reach the desired project objectives. As a result, project risk identification to understand its impact is one of the early steps in the risk management process. According to Mahendra et al (2014), identification of different risk factors and its impact on projects is acknowledged to be one of the critical processes and capabilities during project operations.

Classifying project risks can be conducted through several approaches. These risks can be categorized to be internal as well as external. As El-Sayegh (2014) explains, there are other forms of risks that influence project operations in the construction industry. These risks, according to the study, are client-based risks, financial, design, material, and contractors' risks. During project operations, risk management entails the issues of project sciences and specific art to be able to design clients' projects while sciences focus on defining and coordinating operations through knowledge, skills application and to understand the project in its entirety

including project management process (Mahmood, Azhar & Ahmad 2011). Another factor is the design aspect of the project. Project design is one of the fundamental categories of project risk factors since it is identified as the critical aspect in project construction (Roque & De Carvalho, 2013). Besides, other risk factors, financial risk remains another potential drawback on projects. Lack of project funding means delay in project payment as well as other external issues that are found in the economic climate of operations (Aimable, 2015). Funding related risks are factors that are known to impact severely on projects because of its contributions to payment delays for completed projects (Ofori, 2013).

1.8.2 Characteristics and nature of informal economy

Informal economy has seen important growth in many developing countries in Africa over the past years (Schneider, 2002). Informal economy is characterized as a homogeneous establishment. Due to its nature, the South Africa informal economic activities has been researched over the years by different researchers (Blaauw, 2010; Viljoen, 2014). Informal economy is very small in size but a long-term economy in nature with an average length of informal job opportunities and other informal economies (McKeever, 2007; Blaauw, 2010; Theodore et al, 2015). Transitional countries have seen adequate expansion of diverse increase rates due to informal employment soon after liberalization (Guha-Khasnabis & Kanbur, 2006). However, due to persistent growth rate informal economy is no longer perceived to be in transition in the process of development but waiting to become part of the informal economy (Williams & Lansky, 2013). Describing informal economy involves three guiding theories namely the dualist, the structuralist (referred to as neo-Marxist approach) as well as the legalist (neoliberal approach) (Wilson, 2011). Since its inception as a theory, the dualist approach overlooked the various aspects of the informal economy rather the functions of the sector are described to be passive, employed unskilled labour and lack the support of unions (Mehrotra & Biggeri, 2007).

1.9 Scope of the study

The scope of this study remains within the geographical settings of the FSP. In total four DMs were earmarked for the study. The informal contractors who participated in this study were selected from 8 LMs of Matjhabeng, Nala, Tswelopelo, Dihlabeng, Mluti-A-Phofung,

Setso, Ngwathe and Moqhaka were selected from 4 DMs to provide primary data for this study. The informal contractors reside and operate in the selected Local Municipalities of the Free State Province.

1.10 RESEARCH METHODOLOGY

1.10.1 Outline of the research design and methodology

As researchers Burns and Grove (2003) explained, research design is a specific plan and a structure of an investigative strategy that seeks answers to research problems and questions. Its primary function is to allow the researcher to institute specific and appropriate action plans that is structured to assist the entire research process to increase and validate the results of the study. This study applied mixed method approach namely the quantitative and qualitative (Creswell, 2014; Gay, Mills & Airasian, 2012). In the process, the inductive as well as the deductive approaches were utilized. In addition, critical literature review was undertaken to understand and identify different but related research issues to draw linkages between the research problems and the body of scientific knowledge.

For qualitative, the study applied focus group discussions (FGDs) to gather empirical data with supplement through a self-design interview schedule while 5-point Likert scale questionnaires was applied to gather raw data from the research participants referred to as informal contractors. Quantitative data was analysed through the statistical tool known as the Statistical Packages for Social Sciences Software (SPSS) for maximum outcomes. The descriptive and inferential statistics were applied to organize and prepare a summary of the data aided by charts, tables, and graphs (Maree, 2007). Qualitative data focused on FGDs that was thematically analysed based on themes and sub-themes. The methodology is further discussed in detail with justifications in chapter four.

1.10.2 Target population

Target population according to Flick (2011) and O'Leary (2013) entails an observation, elements of participants including people, organisations as well as people that have various characteristics. Besides, population is defined as elements or specific groups that is of research interests to be used by the researcher during scientific study (O'Leary, 2013). To ensure

sufficient realization of the final study results, this study used a total target population of 500 informal contractors in the construction industry across all the district municipalities from the Free State Province. Informal contractors are defined in this study as individuals with skills such as artisans and architects who operate in the construction industry to build roads and other projects including bridges, housing, and other community facilities. The informal contractors operate mainly in the informal economy using unprotected labour and unregistered businesses.

1.10.3 Sampling technique

O’Leary (2012) defined research samples as the fraction or partial representation of the research target population. However, Leedy and Ormrod (2010) argued that not all sample representatives are the true elements of the target population. Across the social sciences climate, a sample design is highly acknowledged to be very significant including the sample size, errors and representatives that needs to generalize (Palinkas et al, 2011). The decision by the researcher to select the sample type includes considering budget, time, and human constraints. In this study, the sample size was based on target population of informal contractors from DMs. Creswell (2012) indicates that using probability sampling techniques becomes applicable sample frame. This mixed (quantitative and qualitative) research study applied a simple random sampling was employed to select 304 informal contractors to avoid bias and provide an exhaustive list of a larger population (O’Leary, 2013).

1.11 OVERVIEW OF THE STUDY AREA

In South Africa, all the municipal structures were established through Chapter seven institutions of the Constitution Section (152) and (153) respectively. The primary functions of these municipalities include the provision of infrastructure such as roads, sports facilities, and other infrastructure projects (RSA, constitution, 1996). The local government structures were divided in 2000 into three categories. These include category A, B, and C municipalities. Category A municipalities are the metropolitan areas with exclusive and legislative powers. While category B municipalities also known as the local municipalities are found outside the metropolitan areas. The district municipalities (DMs) fall under category B that exercises similar powers and primary functions as the local municipalities (LMs). The DMs are ranked as category C respectively.

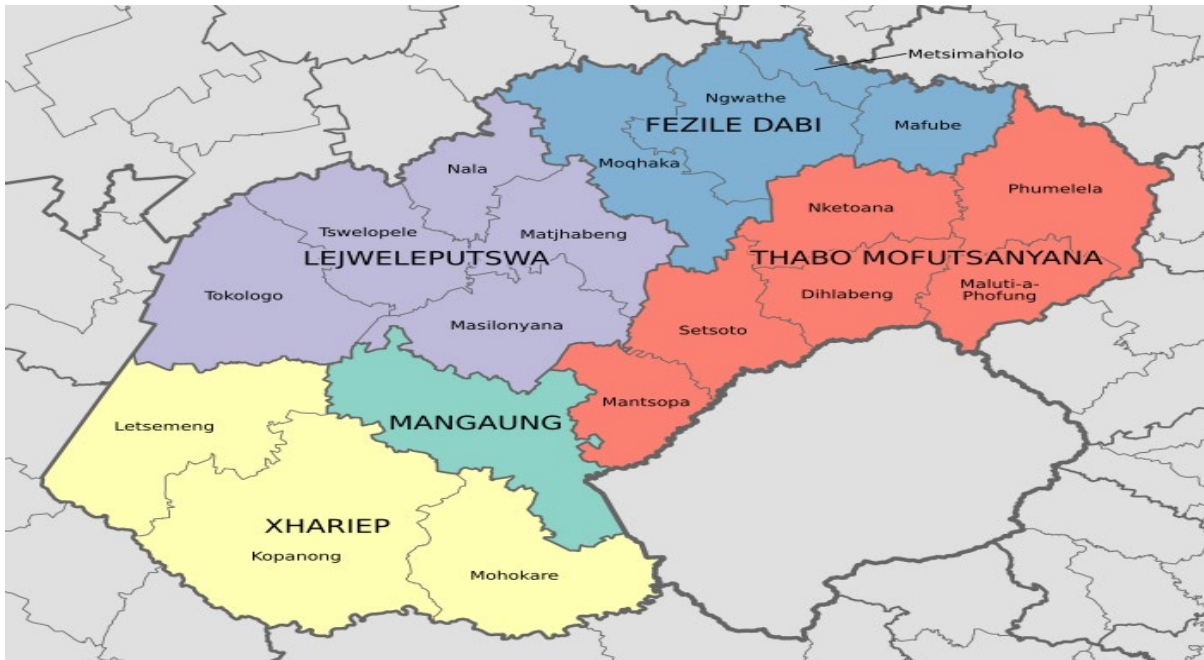
The Free State Province (FSP) is at the Centre of the provinces of South Africa with a population of 2.8 million estimated to be 5.7% of the entire South African population (Statistical South Africa, 2007b). The province is bordered with the Eastern Cape, Northern, Gauteng, KwaZulu Natal, the Northwest, and Mpumalanga provinces while the province share a border with the Kingdom of Lesotho.

The main economic activity of the FSP is agricultural products. Its agricultural industry forms the primary livelihood of the province with roughly 2.3% of the population participating in agricultural produce. The agricultural produce of the province adds about 7% to the GDP of the province. Recent study by FSB (2012) showed that 14% of South Africa's agricultural output comes from the FSP while 14.5% of the country's commercial farming industry is generated from the FSP.

The province is also recognized for its economic contributions in producing sunflower (45%), Sorghum (53%), maize (34%), cherries (90%), groundnuts and potatoes about 32% and 34% respectively (FSB, 2012). Aside agricultural produce, the province is famous to produce red meat and its dairy products which have increase substantially (FSB, 2012).

Some of primary contributors of to the FSP economy include its tourism destinations such as the King Park Rose Garden, The Gariep Dam, the "*Clocolan*" known for its cherry trees, the Llandaff Oratory, the Golden gate highlands and The Uredefort Dome among others (The government of South Africa, 2016). Figure 1.1 below is an illustration of the study areas including the four DMs and the eight LMs where the informal contractors were selected to participate to provide primary data.

Figure 1.1: Free State Province, Districts and Local Municipalities



Source: Local Government Handbook, 2016.

1.12 OPERATIONAL DEFINITIONS OF KEY CONCEPTS

1.12.1 Research participants

Throughout this empirical study, the participants are from informal economy of the FSP of South Africa. The participants are informal contractors who operates from the selected district municipalities. These individuals understand the insights in addition to some level of the construction skills and practice. The participants practice construction skills for the construction of projects informal economy for over 10 years.

1.12.2 Contractors

Defining contractors includes individuals who are qualified though with the least construction skills. In the context of South Africa, report commissioned by CIDB Act38 of 2000 states that public sector clients are not allowed to give contract to contractors without registration. The contractors who participated in this study hails from informal economy.

1.12.3 Informal contractor

The construction industry consists of formal and informal contractors. Informal contractors comprise of individuals who are employed in construction firms that supply labour for construction activities without applying the requisite registration processes. Informal contractors work in informal construction industries that are unregistered, unprotected workers in small and emerging small firms that supplies unprotected labour for output in the construction industries.

1.12.4 The construction industry

The construction industry is defined in this study based on the definition by Ofori (1990) as a small and informal economic establishment that is involved in different construction activities namely planning, designing, alteration, maintenance, and repair activities. Given this definition, the industry involves several role players who undertakes series of civil architectural tasks that are project-based according to customised specification (Akiner & Akiner, 2009). In addition, the construction industry was also found in different sectors of the economy including agricultural projects, the mining and quarrying projects, financial, energy, transportation, the manufacturing, and household projects (Olanrewaju & Abdul-Aziz, 2015; Rameezdeen, 2007)

1.12.5 Risk Factors in construction industry

Risk factors have been well documented within the construction industry namely financial crises, business shutdowns, delays in servicing financial obligations are some of the known risk factors. Other forms of risk factors include the environment, physical, logistics, product design, financial, legal, political and the construction sectors of the economy. Risk factors have the potential to influence project objectives. All over the developing countries contractors are overwhelmed by numerous risks during the construction industry, yet they know nothing regarding the factor of risks as well as the knowledge to better manage the risks (Tadayon, Jaafar & Nasri, 2012). According to Mishra and Regmi, (2017), the inefficiency and lack of reliable contractors in developing countries to manage the risk factors during operations are some of the primary reasons for project failures. These risks are discussed throughout this study to understand the impact of each of them within the construction industry and the informal contractors.

1.13 Delimitations of the study.

This empirical study is limited to eight local municipalities of the Free State Province. Thus, these outcomes should not be generalized to other local municipalities in the province. Primary quantitative and qualitative data were gathered from the sample size that was selected through the assistance of informal contractors in the selected LMs. Moreover, the inclusion of other LMs across the provincial authorities would have made this study too longitudinal in nature.

1.14 STRUCTURE OF THESIS.

The summary of each chapter that forms the basis of this empirical study are numbered in sequences that present the layout of the entire dissertation. Each chapter is equally structured to depict its context.

Chapter one

Introduction and background of the study

Initially the chapter gave a general account of the introduction of the study and background. The chapter further highlighted key issues including background of the study, key questions and the objectives that were designed to provide answers to the study. A brief discussion of this chapter featured the research methods, data collection as well as analysis of empirical data.

Chapter two

Literature on theoretical perspectives of informal economy

The chapter presents literature review relating to extant theoretical concepts of informal economy based on key theories such as the dualist, structuralist, and the voluntarists views. The historical overviews of the informal economy were highlighted with diagram demonstrating the nature and characteristics of the informal economy. Further, the chapter depicts the economic activities of informal economy in South Africa indicating the growth constraints of informal economy.

Chapter three

Theoretical and conceptual framework.

The chapter discusses the theoretical basis as well as the conceptual framework of the analysis. Different models are also discussed and synthesized to determine the relationship between the concepts that form the foundation of this empirical study.

Chapter Four

Research Methodology

The chapter describes the research approaches that are followed to attain the primary objectives. Initially, the chapter briefly explained the qualitative and quantitative research designs including the nature of research. In addition, detailed discussions were outlined regarding the population, sample gathering and techniques, research instruments applied to collect primary data, and data analysis stating all the statistical tools that were used to make meaning of the primary data. Finally, the chapter explained how the qualitative and quantitative data were analyzed. The chapter provided detailed descriptions of how the formulated hypotheses were tested.

Chapter five

Results, and interpretations.

The chapter presents the analyses of the results and interprets the empirical outcomes based on chapter five. Also, the chapter outlines the theoretical inputs that emerged from data concepts as well as the research propositions. The central focus of the research outcomes was provided by highlighting the qualitative responses of informal contractors to impact the risk factors in the construction firms. The chapter creates the means to draw conclusions as well as the recommendations as stated in chapter seven.

Chapter six

Summary of the study, recommendations, and conclusions.

Finally, the chapter presents reviews and answers based on data analysis to the research aims and objectives. The chapter further provided conclusions on the construction industry and the

risk factors across the research areas. Besides, the chapter presents conclusions considering the objectives stated earlier. The chapter also presents summary, conclusions, and risk management policy recommendations. Finally, the chapter outlines limitations of the study, the key recommendations as well as further empirical study in the future.

1.15. Conclusions

The chapter aims to provide contextual information that is relevant to the focus of the study. The chapter commenced with a brief literature based on the construction industry, the informal and the formal economy. The central aim that provides guidance to the study, the objectives, the research questions as well as the formulated hypotheses were outlined. Next, the overview of the study areas, research methodology, scope of the study and the relevance of the chapter were featured. Lastly, the researcher discussed operational definitions of the key concepts including the contractors, informal contractors, the nature of risk in the construction industry as well as the structure of the study.

CHAPTER TWO

LITERATURE ON THEORETICAL PERSPECTIVES OF INFORMAL ECONOMY

2.1 Introduction

This chapter reviews the literature on informal economy and focuses on nature and its characteristics. The literature review further illustrates the theories that underpin the concept of informal economy, the differences and linkages between the formal and informal economies were outlined in this chapter. The informal economy plays a major role in the global economy. Across the globe, approximately two billion individuals depend on informal economic activities for their livelihood (ILO, 2017). In the African continent, over 85% of the population are employed in the informal economy that contributes roughly 55% of the GDP in Sub-Saharan Africa (ILO, 2017; Ruzek, 2015). The informal economy therefore serves as “*critical incubator*” for micro-entities thus creating competitive edge over the formal economic sector (Will, 2009; Volodia, Davies, Altman & Thurlow, 2007; Charman, Petersen & Piper, 2012b). Describing and using the concept of “*informal economy*” not “*formal sector*” adds to the notion of providing wider socio-economic activities namely provision of job opportunities in developing countries, advanced economies with huge industrial activities and countries in transition.

Generally, there is an association between the formal and informal sectors of the economy (Skinner, 2005). According to recent empirical studies, the formal and informal economic sectors can co-exist and interlinked for economic and social activities (Wan & Zhu, 2006; Guha-Khasnobis & Kanbur, 2006). Through informal economic within State structure, there are different and wider economic realities that entail different socio-economic activities. These activities include the street vendors, trading in clothing and food items as well as providing personal services, namely mechanical repairs, and beauty salons. Informal economy in South Africa is referred to as the primary answers to the country’s socio-economic challenges of high unemployment (Valodia & Devey, 2012; Borat et al, 2016; Devey et al, 2006).

2.2 THEORETICAL PERSPECTIVES OF INFORMAL ECONOMY

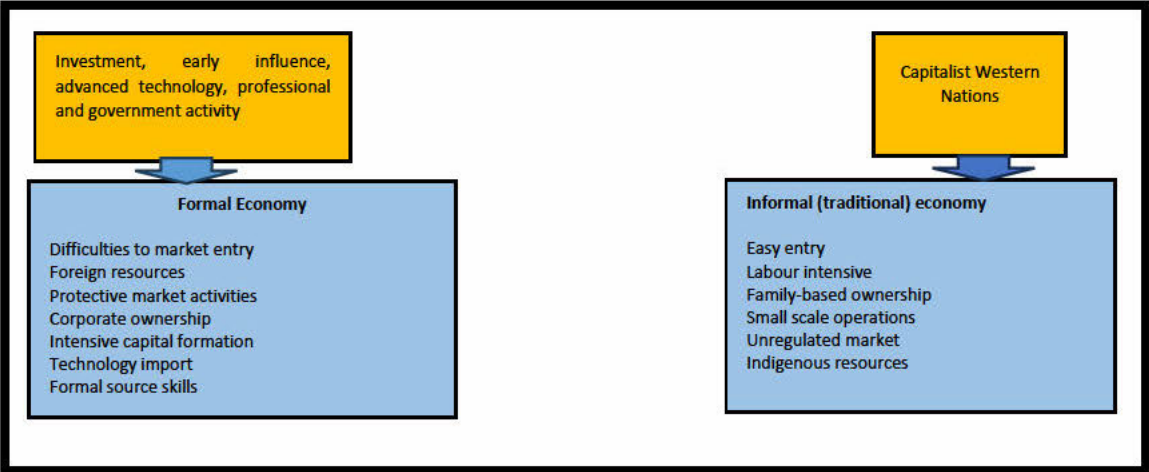
Different academics and scholars used varying approaches, namely the sources and ever-changing informal economy to provide theories that explain phenomenon (Wilson, 2011). Theories such as the dualist, structuralist (better referred to as neo-Marxist) and the legalist or neoliberal views are applied to explain the informal economy (Wilson, 2011). Some of the theories are further explained below.

2.2.1 The dualist views.

Through the academic work of the International Labour Organisation (ILO) supported by the Regional Programme in Latin America as well as from the Caribbean, the Dualist approach started together with Programa Regional Para Empleo en America Latina ELcaribe (PREALC) (Wilson, 2011). According to Wilson (2011), several academics perceived informal economy to be autonomous as opposed to the modern capitalist climate. Thus, the informal economy is perceived as the safety net areas for employment opportunities that consists of poor skilled employees from both rural and urban areas in search of jobs for survival (Wilson, 2011). Though the dualist theory was highly recognized for its contributions to informal economy, other important aspects of informal economy were excluded (Mehrotra & Biggeri, 2007). The formal and informal economies are inseparable due to trading activities through direct production and other trade related services (Chen, 2007).

The earlier part of the dualist model was presented by the author Devey (2003) in a study. The two economies, the formal and informal economies feature divergent characteristics. The formal economy is referred to several factors including market entry difficulties, dependency of external inputs economies of scale, advanced and imported technology. In contrast, informal economy features such as easy entry, small firms, family ownership and use of indigenous resources including poorly trained human capital. Figure 2.1 on the following page clearly depicts the two economies of formal and informal economy consisting of different activities that take place.

Figure 2.1: The Dualist models.

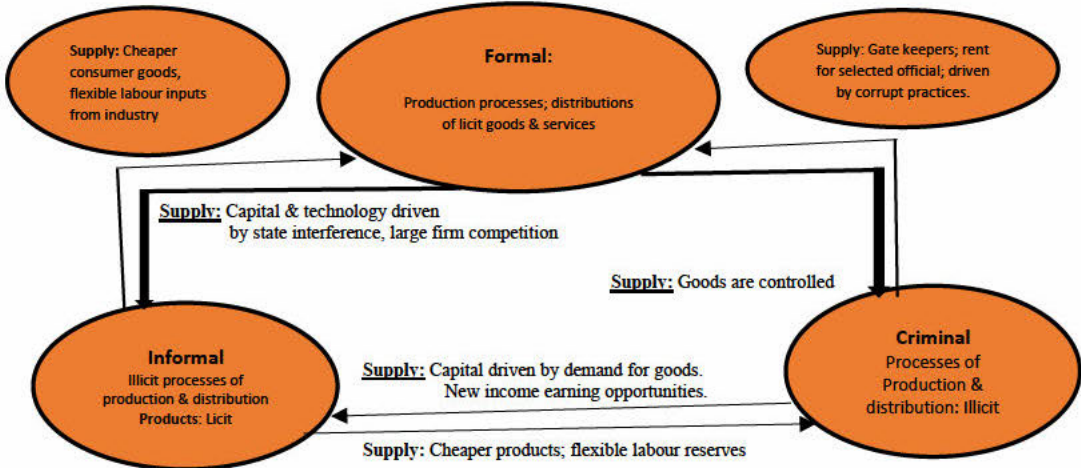


Source: Devey, 2003

Given the nature of the dualist approach, informal economies across the globe are not accountable for trading activities and business operations that are deemed to be illegal or criminal (Rakowski, 1994). The advent of the concept “informal economy” suggests a significant linkage between the two economic activities (ILO, 1972). According to Rakowski (1994), the dualist approach perceived informal economic activities as survivalist and temporary business operations. Informal economic activities according to the dualist approach were to disappear once there is enough degree of industrialization in developing countries.

However, this notion based on the dualist framework shifted and replaced by other progressive models. To ensure the various economic activities do not form part of the formal economic activities, another model emerged (Rakowski, 1994). Figure 2.2 on the following page demonstrates the reasons behind the development of the “*underground model*” even though some of the activities are not legitimate during the production processes.

Figure 2.2: Underground model of economic activities.



Source: Adapted from Castells Portes, 1989

The model above is an illustration of the origin of informal economic activities. These activities include industrialization, economic processes, and counter licit labour legislation frameworks. This economy (informal economy) is highly dominated by illicit dealers including drug dealers, distributors of illicit products and the abilities of operators who evade taxation on operations. The bulk of the informal contractors are unskilled. It is very difficult to provide rough estimate of the underground economy due to increasingly high unrecorded activities. For instance, processes of production and trading activities are concealed from the State regulatory bodies. These and related illegal activities result to losses of revenue in social security contributions.

2.2.2 The Structuralist Views

The workers within the informal economy are in most instances the subcontractors from the construction industry with less or no regard for labour legislative framework (Wilson, 2011). The structuralist model stressed the link between the formal and informal economic sector (Wilson, 2011; Saunders, 2005). This approach is founded to further enhance existing policy recommendations, strengthen institutional policy framework as well as within the political context in which the formal economy operates (Saunders, 2005). While the structuralist views were based on the ideas of Alejandro Portes, the legalist views are closely linked to the basic ideas of Hernando de Soto of Peru (Wilson, 2011). According to the legalist views, informal economy seems to be over-populated in the formal economy (Saunders, 2005; DSoto, 1989). A study by Wilson (2011) revealed that informal economy is defined as “They see the formal economy as part of the emerging entrepreneurs that are constrained only by unnecessary,

slanted, and excessive legislation. The legalist approach entails several elements of informal or “*underground*” economic activities that are associated with the principles of tax avoidance (Strydom, 2014).

As the third school of thought, the structuralists view the formal and informal economy to be linked (Castells & Portes, 1989). Thus, it is agreed that informal economy is perceived to be an establishment that comprised of two components namely the formal entities that avoid exorbitant prices and regulations linked to the formal economy that utilizes the working classes from informal economy for competitive edge (Portes & Schauffler, 1993; Kay, 2011). According to Kay (2011), the informal economy is beneficial to the overall economy because of its capability to provide goods, services, and labour at reduced costs. Similarly, the informal economy is known to offer unskilled labour to community members with difficulties to find employment opportunities in the formal economy to become survivalists. Given the notion of the structuralists, informality in the economy is caused by the sectors ability to respond to organized labour. According to Castells and Portes (1989) recommended that informal economy exists be used to overlook regulatory provisions by the government. Others argued that the informal economy focuses on tax avoidance or to refuse to comply with State regulations across the health and the environmental sectors of the economy (Perry, Maloney, Arias, Fajnzylber, Mason & Saavedra-Chanduvi, 2007).

2.2.3 Voluntarists theory

The theory of voluntarism bears similarities with the entrepreneurs in the informal economy in terms of taxation and regulations. These two issues including tax avoidance trigger unfair competitive working conditions that exist between the two economies. In contrast, the voluntarists and the dualists depart from the legalists’ views that expect to discover mistakes in the registration processes and procedures (Chen, 2012).

According to Borat, Lilenstein, Oosthuizen and Thornton (2016), the notion that by voluntarily entrants to the informal sector creates the opportunities to earn higher income through the means of tax evasion as well as avoiding related legal expenses that forms part of the economic activities. Recent study in some countries in Latin America by Maloney (2004) revealed that over 60% of Brazilian and Mexicans that benefited from self-employment opportunities in informal economy were not forced to vacate their employment in the formal economy

(Maloney, 2004). Further study in Paraguay and Argentina also showed scientific data below 30% of self-employment in informal economy that were willing to seek employment in the formal economic labour market; an indication that in most cases informal economy employees experienced low skill levels and below accepted educational qualifications thus, the motivation to rather work as informal employees not formal employment where one is required to acquire higher skills (Maloney, 2004). The study further revealed that working in informal economy is motivated by flexibility as well as the autonomy associated with informal economic employment.

Very consistent with the views share by the legalist school, informal activities are “*plucky micro-entrepreneurs who chose to operate informally to avoid the costs, time and effort of the formal registration*” (Chen, 2012). It is further argued that unlike the structuralist and the dualist views, the legalist is of the view that informal activities are neither a function of poverty nor the structural necessity of late capitalism. As Bonnet and Venkatesh (2016) argued that the concept of informality includes the actors’ rational business decisions continued to be obstructed due to the legal environmental issues. All these different activities largely circumvent the legal system as the formal institutional framework, system of taxation as well as the existing administration costs within the formal economic sector become unproductive to business growth. Given the views expressed by Soto, informal actors are seen to be highly and most efficient market forces that react to over-regulation. Chen (2012) argued that for the voluntarists “*the informal enterprises should be part of the formal regulatory climate to increase its tax base to lessen the unfair competition to the formal enterprise*”.

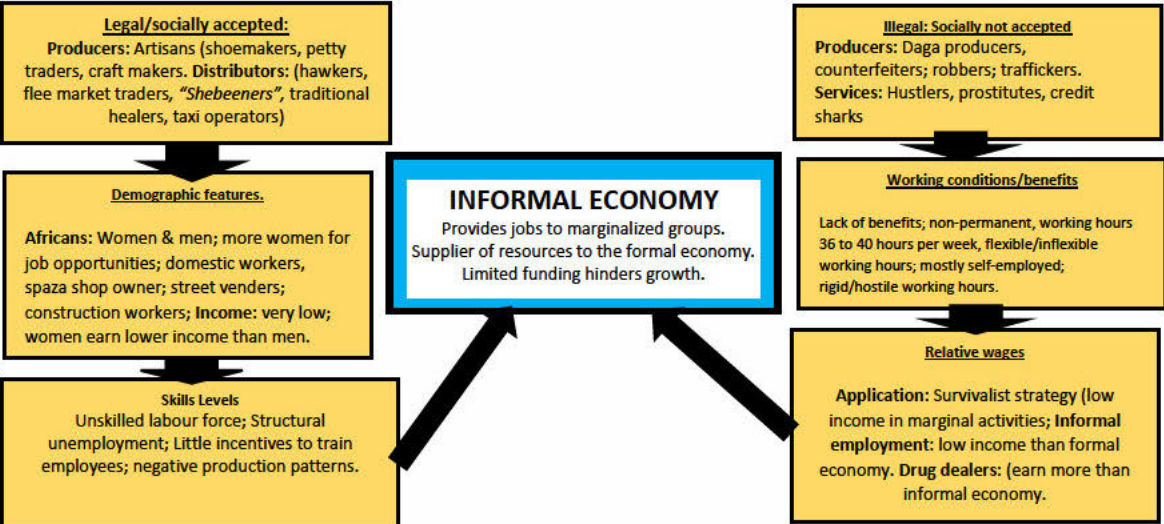
2.3 HISTORICAL OVERVIEW OF INFORMAL ECONOMY

The popularity of informal economy continues to increase during the 1950s as a dual sector model known as the theory of development. Arthur Lewis (1954) makes a proposition regarding two economic sectors namely the traditional and the modern economic sectors. The traditional economy of the formal economy is highly overpopulated and labour intensive while the modern economy is known for its capital-intensive approach, high rate of productivity and industrial (Lewis, 1954). Two continents namely the African continent and the former Soviet Union have experienced significant economic growth during the transitional periods of informal economic activities (Chen, 2012). Over the years, the informal economic sector has been acknowledged by different fields of study including political sciences, economics, and anthropology.

The informal economy features diverse types of employment opportunities including street barbers, garbage searchers, traditional herbalists, owners of spaza shops and street vendors among others (Blaauw & Bothma, 2003). Recent activities of informal activities include the activities of car guards at shopping malls, and other public socio-economic places such as the library services. According to Mohr (2007), there is significant distinction between legal and illegal informal business activities in South Africa. These are categorized as producers, distributors, and services. These activities include payment for services and goods that are referred to as illicit despite being produced and distributed by skilled individuals who are the artisans in the field of construction, craftsmen, hawkers with specialized skills with relatively low income.

In sum, most of the trading activities in an informal economy are undertaken by unskilled individuals with little motivation and training. Figure 2.3 on the next page shows the different activities that take place in the formal economy as defined.

Figure 2.3: Informal economic activities



Source: Own design for the study.

There are different role players that operate in the informal economy. These role players include producers, hawkers and distributors of goods and services as well as petty traders and other small businesses (SME, South Africa, 2022). Through the services provided by role players in the informal economy, the lives of households are sustained through income (Hovsha & Meyer, 2015). Informal economy features craftsmen who contribute to over a third of employment

opportunities country-wide thus reducing poverty and high rate of unemployment (Stats SA, 2022). In return for their services, domestic workers and gardeners are paid monthly or weekly wages with very low income without any form of incentives for training (Skinner & Haysom, 2016). Aside from the low-income payments for employment opportunities, working hours for employees are flexible depending on initial agreements reached between the employers and the employees. Firms that operate in informal economy are referred to as survivalists as most of the incomes that are generated are very low without added benefits as expected from the formal economy employment.

2.4 The nature and characteristics of informal economy.

The past three decades revealed significant and rich literature through several researchers (Blaauw, 2010; Viljoen, 2014; Heintz & Posel, 2008, Saunders, 2005; Ligthelm, 2008, Muller, 2016). Defining informal economy seems to lack definite agreement. Informal economy seems to be less significant to economists, microeconomists as well as national income accountants (Saunders, 2005). Although informal economy is regarded small in South African context, its long-term nature country-wide is of high distinction (McKeever, 2007).

According to South African research on different informal activities, daily workforce across the country is mainly found in informal economy (Blaauw, 2010; Theodore et al, 2015). Available employment data of informal economy remains underestimated because of illegal activities as the sector can admit fewer proportion of the global workforce mainly in developing (Kingdon & Knight, 2001b; Saunders, 2005). Past study by Theodore et al (2015) add that the nature of South African employment data on labourers within the informal economy depicts similar characteristics of the American informal economy as well. Given its long-term nature, there is ample doubt whether the sector absorbs real employment opportunities.

Viljoen (2014) agrees that the longest waste picker in the street of South Africa worked for 37 years as an informal economic employee. However, in South Africa the informal economy lacks to adapt to the nature of being offering temporary employment as perceived by the dualist approach. Also, the principle of absence to entry level barriers does not feature in South African informal economy (Heintz & Posel, 2008). The dualist theory explains several similarities that gives significant literature about informal economy, as it is characterized with both the formal and informal labour marketing conditions (Uys & Blaauw, 2006).

2.5 Conceptualizing informal economy.

Historically between 1950s and 1960s, several academics and scholars were of the view that developing countries largely depends on the traditional labour activities by producing products to grow the economy (Williams, 2015; Lewis, 1959). The informal economy had not only demonstrates persistence economic activities but to also expand into different economic activities of the developed and developing countries (Williams, 2015; Williams & Lansky, 2013). As elaborated by the British anthropologist Keith Hart, the concept “*informal economy*” originates from a conference in Africa under the conference theme “*Urban unemployment in Africa*”.

In his conference paper held by the Institute of Development Studies, University of Sussex in September 1971. The topic for discussion was “Informal income opportunities and urban employment in Ghana” provided the significance of informal economy in building economic growth (Hart, 1973). Ever since, the term “*informal economy*” was coined and cited also in a similar study in Kenya by the International Labour Organisation (ILO) in 1972 (ILO, 1972). The outcomes of the Kenyan conference during the 1990s applied the term “*Informal economy*” as a replacement of “*informal sector*” that indicates broader strings of socio-economic activities such as enterprises and other employment opportunities in advanced industrialised countries, the developed and transitional economies (Skinner, 2005).

Informal economy is described as “*daily labour market’s stock absorber*” in developed countries including South Africa (Theodore et al, 2015). However, informal economic activities in South Africa are in the lower tier that has been described as the primary reservoir of employment opportunities. According to Dimova, Gang and Landon-Lane (2006), informal economy strives closer to the formal economy to be sustained as the primary sector, yet the sector lacks key prerequisites of an urban phenomenon. Informal economic activities are utilized by several developing countries as their main economic drivers for survival. Its economic significance according to ILO (1972) report is characterized as a set-up that is easily entered, that relies mainly on rural resources, family-owned firms, and labour intensive. It is estimated that roughly the informal economy provides employment opportunities to individuals in non-agricultural sectors (ILO, 2014). According to the study, informal economy offers a total of 82% of non-agricultural sector jobs in South Asian countries, 10% across Eastern Europe and Central part of Asia and 66% across sub-Saharan African countries (ILO, 2014).

The high growth rates and persistent nature across different economic landscapes is a testimony that informal economy does not represent any transition during the processes of development to become part of the formal economy (Williams & Lansky, 2013). The formal and informal economy are dependent on each other for development (Wan & Zhu, 2006). As Guha-Khasnobis and Kanbur (2006) explained, the steady expansion of informal activities is very significant in every transitional country.

Over the past decades, the informal economy has experienced a surge in growth across many developing countries in Africa and other emerging economies (Schneider, 2002). For instance, based on available global literature review, the size of informal economy in the developed countries is estimated to be between 14 and 16% of the Gross Domestic Product (GDP). Its contributions to the economy of transitional countries were estimated at 22 to 30%. Regarding the contributions of informal economy to developing countries, it was estimated that as high as 35 to 45% is added to the GDP figures per year (Saunders, 2005). These findings were further supported in another empirical work by Chen, (2007) that revealed an enormous increase in the level of employment through informal economic activities.

The informal economy forms a unique characteristic of the South African economic landscape. According to Kingdon and Knight (2004; 2001a; 2001b), in comparison to other developing countries, informal economy represents relatively a smaller proportion of the overall employment figures of most countries. However, Burger and Fourie (2018) argued that the sector has in the past experienced dwindling figures of roughly 20% in 2000 to an estimated 16% in 2015. Besides, the study revealed that since 2007, the informal economy has not been able to absorb any additional working class in the labour force that was left without employment opportunities in the formal sector. Informal employment numbers have not even increased proportionally to the growth in the labour force (Burger & Fourie, 2018; Statistics South Africa, 2015). It is of utmost significant to conceptualize the linkages between casual employment opportunities and the general patterns of the reformed labour market that focuses on the immediate requirements of research documents and presentations of the informal economic activities (Theodore et al, 2015).

2.6 Defining informal economy: ILO definition.

One of the most definitions that is accepted entails the International Labour Organisation (ILO) guidelines. According to the principles, the informal economy is defined in different context across several countries (ILO, 1992). In summary, criteria applicable to define informal economy is not similar depending on the application of terms used. Based on the 15th International conference of Labour Statistics (ICLS) in 1993 used the approach of enterprise to provide identification of the informal workforce.

According to the ILO (1993), informal economy is defined as *“the informal economy is broadly characterized as consisting of units engaged in the production of goods and services with the primary objectives of generating employment and income to individuals concerned”*. As Saunder (2005) explains informal economy consists of households that owns informal firms that are unregistered, owned and operated under specific legislative framework. According to ILO (2002) definition, informal employment occurs outside formal business operations. At the 17th ICLS conference, guidelines were adopted that entail extending informal employment terms as a complement to the ILO definition of 1993 (Husmanns, 2012). The 17th ICLS Conference resolved to define informal employment as the overall number of jobs found in informal economy whether in informal or formal firms of households during a given timeframe (Husmanns, 2012). Table 2.1 below depicts the definition of informal employment.

Table 2.1: 15th ICLS and 17th ICLS definition of informal employment.

Enterprise	Employment Relationship	
	Formal	Informal
	Formal	1
Informal	3	4

Source: Devey et al, 2006b

The table above illustrates the “enterprise approach” of the 15th ICLS definition of the informal workforce as the entire number of employees that are employed in the informal economy as shown in cells 3 and 4. Adversely, the definition adopted during the 17th ICLS Conference consists of informal employment whether it is in the formal or informal settings. The total

number of informal employments as the ILO definition is therefore the total number of employees in cells 2 (ie. 2 and 4) respectively.

2.7 Formal and informal contractors

Formal contractors are perceived to operate in the formal economy. Through the activities of subcontracting, formal and informal contractors are linked to improve business collaborations (UNCHS, 1991). The ongoing collaborations within the construction industry create easy access to construction materials, sub-contracting tasks to assist productivity in the formal economy. Besides, there has been greater dependency on informal contractors in the areas of masonry and carpentry work including concreting tasks on large scales. This is because large constructing firms across the formal economy are unable to employ more and provide labour on larger scale as the industry cannot afford ongoing workload schedules in the economy. This lack of permanent employment by the formal economic sector due to workload fluctuations in the construction industry further creates the climate for the establishment of informal construction industry.

The construction sector is made up of several role players. Some of these role players include formal and informal contractors. Small and large firms are known to operate in the formal as well as informal economies in the developed and developing countries. Informal contractors are responsible for labour supplies to the construction industries in the formal economy. Besides, the informal contractors operate in the construction industries that are bit registered and unprotected in terms of working conditions. They are known to supply labour to the construction industry to achieve project objectives. According to Ganesan (1982), the construction industry continues to employ small constructors as well as large firms. The surge in small construction firms creates the climate of promoting informal contractors.

2.8 Informal economy of South Africa

In relation to other developing countries, South African informal economy is very small. However, during the 4th quarter of 2019, informal economy provided employment opportunities for over 2.9 million South Africans (Statistics, South Africa, 2020). The government of South Africa understands the capability of informal economy to offer employment since the government was aware of growth of the informal economy to the value of five million by 2032

(National Planning Committee, 2013). Despite this potential, informal economy has been defined because of low opportunity costs of operations, and inability to overstate its competitive markets. As explained by Rogan and Skinner (2018), informal economy is disconnected from formal and the global economic activities. As such, informal economy is not able to facilitate self-growth business opportunities.

South Africa like other developing countries continue to display an invisible and growing vibrant informal economic activities. Yet the informal economic landscape is smaller than other countries. The average size of informal across Sub-Saharan African countries is roughly 42.3% of the Gross National Income (GNI) an estimate of 60% in other developing countries such as Tanzania, Zimbabwe, and Nigeria. An estimated statistical data of 30% GNI of informal economic activities is recorded in South Africa that was smaller as an acceptable data due to the existing high unemployment rate.

2.9 Informal economic activity of distributions in South Africa.

Different sectors of the South African informal economy contribute to the economic well-being of the country. For instance, the trade sub-sector of informal economy provides 40.5% of employment opportunities in informal economic activities resulting to over one million informal traders trading in goods and services (SALGA, 2012). The level of disproportionate contributions of South Africans informal retail trade sub-sector creates an exceptional economic opportunity different from other sub-Saharan African countries.

Other informal economic activities that follow the trade sector include the services sectors of the construction industry, transportation industry and community services. In contrast, the utility services and the manufacturing sectors of informal economy add very minimal to the informal employment activities in South Africa. The primary differences in employment across these sectors could be that the services and trade sectors of informal employment experience minimal risk of doing business and high rate of ease of entry, lesser start-up costs unlike the manufacturing and mining sectors which require more capital (capital-intensive) for operational activities. Table 2.2 below illustrates the 2016 (July-September) informal economic employment distribution data of the main trading sectors of South Africa for the 3rd quarter.

Table 2.2: Informal employment of different economic sectors

Economic sector	Employment figures (in thousands)
Manufacturing	186
Mining	4
Construction	475
Utilities	5
Trade	1070
Transport	255
Finance	224
Community & social services	422

Source: Own compilation based on literature.

2.10 The nature of informal economy in the global context.

Informal economy of South Africa is described to comprise of small businesses that employ between 0-5 individuals thus, adding over 5% to the South Africa's Gross Domestic Product (GDP) overall national statistics. These firms are in poorer and informal economies that generate lower income (StatSA, 2014). In 2014, the informal economy represents an estimate of 17% representing 1 person in every 6 of the employed workforces in South Africa (Statistics South Africa, 2014).

Informal economy development was highly skewed to the policy of apartheid in South Africa as enshrined in the Black Urban consolidation Areas Act of 1945 as well as the Group Areas Act (Act 36, 1966). In general, the informal economy of South Africa remains very small in contrast to other developing countries. This and other limitations were because of restrictive policies and laws of the past by the apartheid system. The apartheid legislative framework created strict limitations on various goods to be sold for public consumption, blocked state institutions and public establishments operated by Blacks from various communities, formed bureaucratic procedures to discourage small firms' registration to engage in economic activities (Standing, Sender & Weeks, 1996). Report by the International Labour Organisation (ILO) (2013), in Sub-Saharan Africa showed that informal economic employment largely increased in percentage of non-agricultural job opportunities. Across the Southern African countries,

informal employment is lower between the range of 32.7% and 43.9% in South Africa and Namibia respectively (ILO, 2013). The report further indicated that in Africa other countries have attained over 50% greater. For instance, in Mali informal employment figures reached 81.8%. However, informal economy reduces significantly in rich countries with figures to the value between 9.3% in Mauritius and South Africa it was 17.8% (ILO, 2013).

2.11 Overview of informality and poverty.

Empirical research by several researchers indicated a relationship between the informal economy and the level of poverty (Kingdon & Knight, 2007; Rogerson, 2007; Neves & Du Toit, 2012). The general perception that only specific social class from communities are allowed to participate in economic activities were the representatives from poorer communities are only women and the unemployed population (Owusu, 2007; ILO, 1995; Watson, 2002a; Chen, 2012). In an empirical study, Skinner (2006) revealed the relationship between poverty and informal economy in various countries including Latin America, Africa and Asia. Chen (2012) further agrees that informal economy bears linkages between informality and potential growth. The study further indicated stronger association between informality and growth as well as the linkages between inequality, poverty, and informality (Chen, 2012).

In the context of South Africa, informal economy is intricately linked with different communities, values, and the supply chain systems across the formal economy. According to Neves and Du Toit (2012), this relationship is limited to the marketing of traditional herbs and medicines where active participation is in informal economy. The procedures and processes of localized medicines take place through informal supply chain using informal transactional methods via sub-contracting of different people from informal economy (Chen, 2012). Different networks within the informal economy play critical roles in the production and distribution of assorted products and services. Formal and informal economies are linked as income generated in informal economy is spent in exchange for manufactured goods and for other forms of services from the formal economy (David et al, 2012). Consequently, any form of losses impact on individual consumption patterns and reduce gross spending across the formal and informal economies. However, as David et al (2012) explain, the formal economy suffers significantly due to lack of increased spending from communities in the informal economy.

2.12 Reasons for the negative impact on informal economy

The informal economy is globally acknowledged and perceived to be inevitable due to its income generation potential (Harrison et al, 2008). However, the economy is riddled with harsher planning controls and strict by-laws, conflicts in locating business venues, residential zone challenges as well as land use restrictions (Watson, 2011). These imply that informal economy is plagued with several restrictive regulations during operations.

According to Harrison et al (2008) and Tipple (2005) were of the notion that the restrictive regulations made it impossible for “*poor transitional areas*” to be more developed. Small businesses depend on enough infrastructure for business operations. Without adequate infrastructure to improve the existing working climate, it would be impossible to operate businesses in informal economy (Rogerson, 2004). According to Lund and Skinner (2003) progress made by the Government to address infrastructure constraints has not been enough. Most informal community members find it difficult to pay market-related prices unlike small business operators who reside in the formal economy (Chandra, Nganou & Noel, 2002; Almeleh, Mncube & Oosthuizen, 2011). Informal businesses are more vulnerable to natural risk factors, crime, and natural disasters (Cichello, 2005; Yu, 2012; Skinner, 2006). Informal business communities are faced daily with high levels of contact crime and other property-related crimes (McDonald, 2008; Masuku, 2001). For instance, small businesses often known as “*spaza shops*” are unable to sell their beer products because of criminals (Gough et al., 2003).

Business operators in informal economy have become more constraint due to the emergence of foreigners from other developed and developing countries including Chinese, Somalians, Pakistani. These individuals operate spaza shops in informal economies and practice the business strategy of “*bulk wholesale purchases*” (Basardien, Parker, Bayat, Friedrich & Appoles, 2014). Aside from the current infrastructure deficiency, small and macro business owners are less privileged in contrast to their peers who operate larger firms in the formal economies (Chen et al, 2002). All these impediments make it extremely difficult for informal business operators to fiercely compete in the market given the low innovative skills and competence levels (Basardien et al, 2014). Another area of concern is access to finance that weighs heavily on business operators in an informal economy. Financial awareness that was

provided by institutions is complex thus it has become difficult for operators in informal economy to understand and access funds (SBP, 2011).

2.13 A depiction of the characteristics and conceptualization of informality

The term “*informal economy*” is explained without agreement by academics and researchers across multiple disciplines. While informal economy focusses on various socio-economic activities in rural and urban communities, others use the term “*informal sector*” to denote different group of individuals that bears linkages with the informal systems (Saunders, 2005; Devey, Skinner & Valodia, 2006). Addressing and defining the concept of informality is based on approaches of an enterprise since the informal sector is understood to apply firm size to its definition (Moser, 1978). Other descriptions and definitions applied the registration as the bases to describe the concept of informality (Magidimisha & Gordon, 2015).

In sum, accounting for informality has not been easy as the basic characteristics that are used in defining the concept have become debatable to reach the precise and acceptable definition and its measurement. Different academics and researchers across disciplines tried to explain the complex nature of informal economy without success due to the organizational, legal, and financial domain. In economic context, defining informal economy is based on two issues namely through business registration processes or to unregister the business (La Porta & Schleifer, 2008). Describing informality according to Centeno and Portes (2005) were of the view that it is a business transaction where the state receives nothing and provides no protection to individuals.

According to Chen (2007), informal economy bears no legal status and not regulated only the relationships with employment with accountability. From psychological and political perspectives, Neves and Du Toit (2012) described informal economy as an entrepreneurial activity with an entrepreneurial mindset of individual driven by the ideas of socialism and the concept of redistribution. During the 15th International Conference of Labour Statisticians organized by ILO, informality was defined to mean employees who works in the informal conditions based on the following including employees’ status of registration and the firm registration status. Defining informal economy became standardized during the 17th ICLS conference in 2003. Its definition emphasizes employment relationship with focus on other social issues with no social backing and not legally regulated (Devey et al., 2006; Essop & Yu, 2008).

The study further revealed that employee definition entails every form of informal employment that takes place within the informal economy. Further characteristics include lack of permanent nature of employment, no structured employment conditions, no medical aid benefits, and lack of contract-based employment conditions (ILO, 2003; Chen, 2012).

2.14 THE FORMAL AND INFORMAL ECONOMY: THE LINKAGES

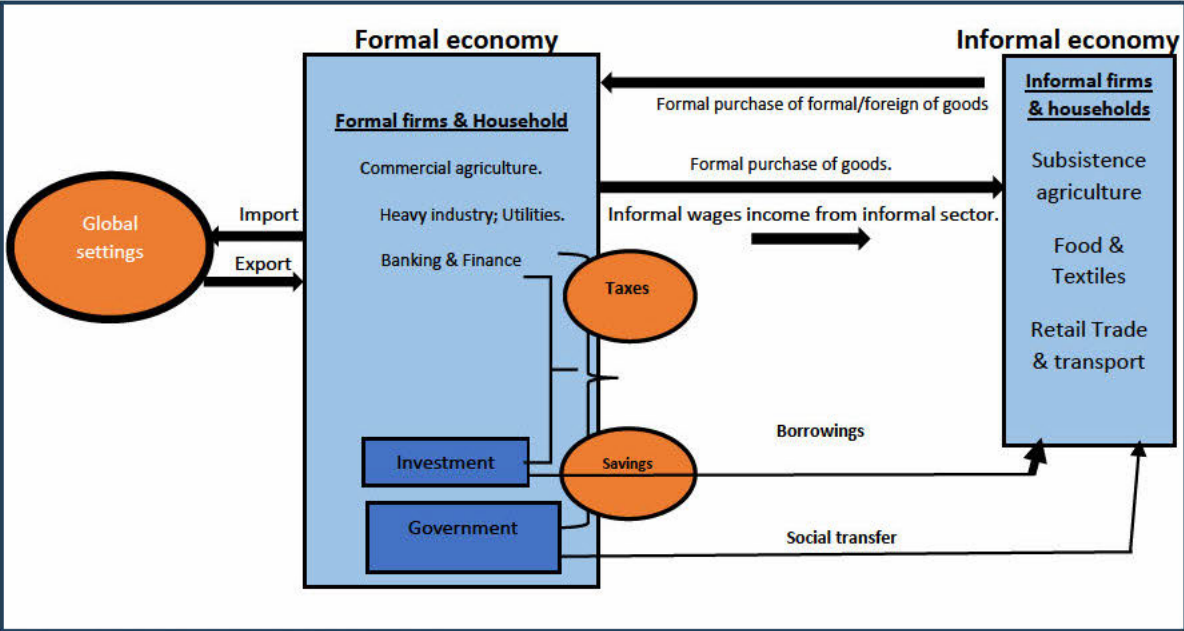
Thurlow and Davies (2009) have described the formal and informal economic activities as the South African Formal-Informal model (SAFIM). The two economic activities cannot be assessed separately since they intertwined. Consumers rely on the bulk of the products that are produced in the formal economy. According to author Chen (2012, 2014) and the of multitude of forward and backward linkages between the formal and informal economy have received heighten recognition and support. In Soth Africa, the informal economy gained closer linkages with the commodity value chains that are found in informal economy. Yet, as Neves and Du Toit (2012) explained that the link does not include the activities of traditional herbal medication.

Nonetheless, the authors were of the view that majority of products and raw materials that comes from suppliers in the formal economy to informal economy are for retailers and manufacturers. There are procedures to source materials as well as to supply products that occur through transactions by individuals in the value chain or through subcontractors (Chen, 2012). Income that is generated through informal transactions is used to access goods in the formal economy thus showing as an aggregate national spending patterns. Subsequent loss of income from informal trading are inclined to attain a much larger spending in contrast to business owners that operate in the formal economy (Davids et al, 2012). Figure 2.5 on the next page depicts all the household activities that happens in the formal economy are outlined according to the economic contributions in terms of agriculture products and other services.

Other informal economic activities such as subsistence agricultural products, the retail trade sector and the transportation sector depend on the formal economy for business investment through borrowing from savings. Majority of the business owners receive state grants in the form of social transfers. The banking sectors and other financial institutions are found in the formal economy that supplies funds to institutions in informal economy receives grants in the

forms of social grants and other financial aids. Figure 2.4 on the following page shows the economic activities of the formal and informal economy.

Figure 2.4: Integrated economic activities of formal and informal economies.



Source: Thurlow & Davies, 2009

From the table above, it is eminent that there is significant relationship between the two economies through the exchange of goods and services. Formal firms and households form part of the formal economy while the informal economy is housed to informal firms that engage in informal activities of not paying taxes, employ unskilled labour, operating with unregistered businesses. Most of the economic activities are subsistence in the form of agriculture, retail trade, textiles, and the transport industry. To enhance economic growth and promote social well-being, firms in the formal economy are liable to taxes through the banking and finance services while providing investment opportunities to households and firms in informal economy. There are several legit business and trading activities that goes on in the formal economy through investments and transfer of funds in the form of social transfers from the formal to informal economic activities.

2.15 GROWTH IMPEDIMENTS IN INFORMAL ECONOMY

Informal economy is met with daily constraints for its workforce. Key among these constraints include issues of registration and lack of union membership.

2.15.1 Harsh regulatory working climate

Despite strict control measures, planning and stricter by laws challenges, the informal economy continues to be well-recognised as the primary generator of poor households' income (Harrison et al, 2008; Watson, 2011). Other impediments include stricter licensing rules, restrictions regarding shopping hours, the zone areas for shebeen operators and applied to be used as management of new operational locations.

According to Harrison et al (2008), these restrictions are applied to enhance business development among communities. However, Tipple (2005) disagreed as some of these commercial zoned areas are for business operations are rather used for residential purposes. Besides, the surge in extending rural areas into urban dwellings for communities continued to raise significance issue of urgent attention to the problems of spatial disciplines (Tibaijika, 2006; cited in Watson, 2009). Regarding the rapid rural growth, it is suggested that the community practitioners devise specific intervention technique to assess the general livelihood of communities. As Watson (2011) explains, urban planning measures shape the working climate of informal economy.

2.15.2 Other research gaps

Several research indicated that the reasons for increased and continued growth of informal economy include the lack of skilful employees and adequate funding (Skinner, 2006; Neves & Du toit, 2012). Increasing investment opportunities to service residential settlements like the urban communities with sufficient water needs, energy provisioning, sanitation and safe areas for waste disposals (Napier & Mothwa, 2001; Gough et al, 2003). Given the depth of existing impediments, across the informal economy, viral research is required to develop a holistic understanding of the dominating factors of trade and other forms of trade linkages (Devey et al, 2006; Skinner, 2006). These research outcomes are bound to assist in finding the critical strategic techniques that are applicable for informal construction industry growth trajectory (Skinner, 2006; Devey et al, 2006). There is therefore the need to design suitable systems of interventions that are not similar rather based on locations (Skinner, 2011). However, this quantitative and qualitative study aims to assess the risk factors influencing informal contractors' operations in the construction industry. This was based on the realisation that few studies were conducted to determine the influence of risk factors in the construction industry in

the formal economy. This empirical study sets out to fill this gap in the literature specifically referring to informal contractors operating in informal economy of South Africa. Based on literature review, it became clear that the construction industry cannot operate without the impact of different risk factors.

2.15.3 Infrastructure difficulties

There has been little attempt by government to acknowledge the significance of small firms in operating as informal contractors in the informal economy despite the challenges (Watson, 2009). This according to Rogerson (2004), was due to the lack of adequate infrastructure to assist small firms to improve livelihoods in communities and to curb growing poverty. Though the present democratic government continue to improve the living conditions of South Africans, still there is acute infrastructure backlog that needs urgent attention (Lund & Skinner, 2003). Challenges of infrastructure are not only the overarching concern of informal communities, but it is also for the firms operating in formal economy also to address the issues of “secure space challenges” such as water, energy supplies, security, storage as well as toilet facilities (Lund & Skinner, 2003). In contrast to their counterpart in the formal economy, most informal economic dwellers are unable to pay for market-related activities (Almeleh, Mncube & Oosthuizen, 2011). Furthermore, informal economic operators become more vulnerable to natural occurrences including crime (Skinner, 2006; Yu, 2012).

2.15.4 High crime rates

The challenges of crime and murder rates continue to be well documented in South Africa especially property crime (McDonald, 2008). Small firms are targeted daily by criminals’ country-wide most of whom are either known to communities or active participants (Brink, Cant & Ligthelm, 2003; Cichello et al, 2011). According to Basardien, Parker, Bayat, Friedrich and Appoles (2014), foreigners including Chinese, Somalians and Pakistanis who operates spaza shops across informal economy are largely associated with the reason for growing levels of crimes. This is because unemployed South Africans turn to commit violent crimes in rural areas (informal economies) where there is less visibility of securities. Easy access to market serves as one of the growth fundamentals for formal and informal economies (Carr et al, 2000; Chen, 2012). The formal economic sector seems to be better placed in terms of banking services and marketing facilities in contrast to informal firms who operates mainly in informal

economies. The lack of these facilities to facilitate informal operations create poor capabilities of innovation and competencies (Basardien et al, 2014).

2.15.5 Lack of access to funding

The banking sector of South Africa remains very complex compared to other developing countries. As such formal businesses become very comfortable to doing business with the banks. Regarding the informal firms, the financial establishments are not eager to provide funding to firms in the sector due to their administrative complex settings (SBP. 2011). Recent study in Johannesburg revealed that the financial sectors were unable to provide financial aid to informal traders due to difficulties to access the banking mechanisms and the ability to provide the requisite documentations (Tissington, 2009). Harrison et al (2008) confirmed that informal operations especially the social saving networks such as the “*stokvels*” find it harder to receive funding assistance. Several scientific findings revealed that lack of funding for informal firms constrain growth (Neves and Du Toit, 2012; Lund and Skinner, 2005; Cichello, 2005).

Similar study of over 500 informal firms in Johannesburg indicated that one of the major impediments to growth was inability of firm owners in informal economy to access business funding (Chandra et al, 2002; Neves and Du Toit, 2012). In addition, Charman et al (2012) stated that high credit repayment due to high interest rates serves as another contributory factor to high level bankruptcy levels of firms in informal economy (Neves and Du Toit, 2012).

2.15.6 Lack of business training

Skills training is one of the major influencers of business innovation strategies that lead to performance improvement and increased business productivity rates (Callaghan and Venter, 2011; Lund and Skinner, 2006). Training in management skills, however, remains one of the major worries across informal economy (Basardien et al, 2014; David et al, 2012). Related scientific study of over 81% informal business in informal economy revealed that there was no business support for their businesses (Chandra et al., 2002).

2.16 INFORMAL WORKFORCE PROFILE AND CHARACTERISTICS

The South African labour market is highly recognised because of the growing significance of the informal economy. While the informal economy forms part of the larger South African economy, its low-income opportunities, lack of permanent employment, minimum productivity rates as well as the concerns for small-scale firms that constitutes high labour intensive in various sectors (Hart, 1973). Besides, informal economy largely displays other related economic activities such as lack of social protection for employees. Sub-standard working climate, unregulated working settings, exclusion from the national accounting system, unprofessionalism, flexibility working hours (Barker, 2007; Gerxhani, 2004).

In South Africa, the general characteristic of informal economy is very comprehensive in contrast to other countries. The informal economy of South Africa is largely dominated by the black population with the male workforce averaging 55% in contrast to the females (Statistics South Africa, 2011; Saunders, 2005). In terms of employment statistics of the informal economy Essop and Yu (2008) stated that three provinces namely Gauteng, Kwazulu-Natal, and Eastern Cape experience large volume of informal workforce country-wide out of the nine provinces. Table 2.3 below outlines the share volumes of informal employment in comparison to the rest of the provinces in 2011.

Table 2.3: Provincial employment statistics

Province	Informal volume of employment	Percentages (%)
Western Cape	191,478	8.77
Eastern Cape	257,799	11.80
Northern Cape	31,326	1.43
Free State Province	132,089	6.05
KwaZulu-Natal	465,916	21.33
North-West	89,346	4.09
Gauteng	538,081	24.64
Mpumalanga	190,917	8.74
Limpopo	286,862	13.14

Source: Own compilation based on literature

One of the primary characteristics of informal economy is the growing presence of the survivalist firms that compete highly to adjust commodity prices in response to the prevailing supply market costs (Mkhize, Dube & Skinner, 2013). Similarly, entrepreneurs in informal economy are forced to operate in business climates that continue to display high risk factors at the same time creates avenues for employment opportunities (Caliendo & Kritikos, 2009).

2.17 Informal economy's cyclical relationships to formal economy.

One of the fundamental facts about the informal economy is that the sector operates in a manner that is countercyclical to absorb extra labour. Moreover, as the sector expand its activities the informal economy is faced with severe contractions (Loayza & Rigolini, 2011). According to Fiess et al (2010), the relationship of cyclical between informal and the formal economy relies on whether the socio-economic activities of the labour market are integrated or segmented. Accordingly, conditions of labour market where informal economic activities of employment move counter cyclical means the labour market conditions becomes segmented (Meloney & Bosch, 2007).

However, labour market conditions that creates integration of the formal and informal economies means employment across the economic sectors should be procyclical (Fiess et al., 2010). In the context of South Africa, for informal sectors of the economy to operate outside the domestic marketing conditions requires enough formalisation that cannot be attained through growth-oriented firms. As such, informal economy is entirely dependent on domestic market demands (Philips, 2010). In sum, the informal economy competes with larger and more efficient formal economies all over the world as well as the domestic markets (Philips, 2010). The concept of cyclical marketing conditions are the primary distinguishing features of the general economic conditions of South Africa compared to other emerging countries of middle-income that attained a sizeable informal economic operation and apply an open unemployment condition. Recovery in the overall economy mean increasing private consumption models that creates positive impact on the formal and informal economic employment conditions. As such, there is “*knock-on*” effect on GDP, the formal economic sector employment as well as the informal economy employment that implies that the informal economic conditions experience short-term procyclical conditions with severe market conditions that fluctuates (Burger & Fourie, 2018).

2.18 Conclusion

Given the rich literature on informal contractors, this chapter provides detailed account on the overview of informal sector of the economy. The chapter defined the informal economy with explanation and the historical descriptions of the sector through the ICLS principles and the guidelines commission by the ILO. Besides, the chapter described the linkages between the formal and informal economy. Increased economic activities will highly facilitate economic interaction between the formal and informal economies. From literature it is eminent that the developed and developing countries must accept the significant roles of informal economy regarding the twin challenges of reducing poverty and unemployment levels. Thereafter, the chapter defined the significance of informal economy and describes how the economy benefits from communities' participation in the sector through the active trading. The chapter detailed further definition of informal economy through models such as the dualist, the structuralists and the voluntarists. The chapter provides various definition of informal economy including the explanations of the informal economy under the guidance of the ILO principles. Besides, the chapter outlined the economic thinking that informal economy is based on the dualistic model. The chapter continued to lay emphasis on the primary features of informal activities such as the legal, registered, or unregistered, illegal, licit, or illicit products and services.

CHAPTER THREE

THEORETICAL AND CONCEPTUAL FRAMEWORK

3.1 Introduction

The chapter provides detailed literature reviews of theories that guide this empirical study of the risk factors and the construction industry. The chapter is divided into two broad sections detailing the theories as well as the concepts that underpin this study. It continues to discuss various areas of the construction industry including the definition of relevant theories, an overview of the construction industry, the historical perspectives and background of the industry. The chapter further extends to describe the contributions of the industry as well as the challenges.

3.2 THEORETICAL FRAMEWORK

Theoretical framework represents specific research structure that is designed through the application of an established theory backed by explanations of phenomena and relationships (Creswell, 2014; Collis & Hussey, 2014). The framework encompasses the blueprint of the study and defines all the boundaries of the study and its enquiries. The theories that guide this topic are highlighted below.

3.2.1 Organisational theory

Organisations operate in specific environments due to their relationships with social interactions and bureaucratic practices (Daft & Lengel, 1986). The theory of organization emerges from varying perspectives that are designed to attain effective operations of industries and to further justify all forms of bureaucratic acts. Based on the definition of Dufour, Steane and Corriveau (2018), that decision-making processes illustrate critical steps toward creating changes in an organisation's decision making that relates to different organizational formations. These formations according to Dufour (2018), are utilized as tools to establish concrete organizational working groups. Every group within the organization is functional groups of employees that are established with the aim of defining specific products.

According to Eriksson-Zetterquist, Mullern and Styhre (2011), every organizational structure and group become dependent on each other to accelerate the production of quality output that are likely to surface for the prevention of organizational changes for solutions. Given this definition, it is vital that decision making processes in organisations require resources and time to unearth productive solutions that are valuable to the organisation's operations. By their nature organisations operate in a complex climate thus making sense of what their recourse may be difficult. As a result, one needs to employ multiple views with varying depth of knowledge to provide better and informed decisions based on key analytical procedures.

This form of decision making becomes the hallmark of a modernized organization that seeks effectiveness and efficiency throughout its performance using various structures of governance and strict control measures (Pucheta-Martínez & Bel-Oms, 2018). The construction industry and its stakeholders operate in a unique and complex climate where decision-making to secure operational materials is critical daily. These require stricter risk management strategies while taking care of every risk factor in the environment. Through organizational theory, stakeholders can make the rightful decisions to secure materials and strategize against risk and curb all the risk factors that are likely to reduce the production of sub-standard projects.

3.2.2 The theory of financing distress

This theory explains various factors that trigger growing levels of performance decline in the entities. The theory of financial distress according to Brigham and Ehrhardt (2014) and Fahmi (2013) is one of the theories that outlines issues of financial constraints that incapacitate organisations to fulfil their financial commitments during maturity. It is therefore critical that every organization access and evaluates its financial positions against its readiness to provide for investments opportunities. Despite the significant differences between organisation's investment decision-making and financing, majority of organisations are aware of their benefits hence their financial accounting records are designed to be aligned with comfortable debts and equity to reduce costly measures (Idris, 2017).

3.2.3 The shareholder value of maximization theory

According to Lazonick and O'Sullivan (2010), the concept of maximizing shareholders value focuses on the utmost increase in firm's valuation of existing stock market shares. The primary principle that guides the theory indicates that firm managers need to consider shareholders' interests as key decisions are made. As a vital technique that explains the performance of entities, this study applied the theory of shareholders value maximization to try and control the various forms of construction risks. Within the construction industry, the provision of care and taking the interest of shareholders remain a concern. This implies serving the shareholders' interest to meet expectations through financial means.

The construction industry is marred by challenges and risks including financial distress (Müller, Zhai & Wang, 2014). Shareholders' value maximization in the construction industry is broken into several segments. This includes increasing quality control measures as the industry lack skilled workforce; thus, incapacitating shareholders to deliver quality projects within specified timeframe. According to Müller et al, (2014) the theory of shareholder value maximization decreases information among shareholders. The implications include the reduction in financial costs and growing efforts to improve risk management in the construction industry.

3.2.4 Agency theory

Contractual obligations as a devotion practice to any form of agreement and the primary category for canceling agreements are influenced by the Ancient Greek history (Mohammed & Muhammed, 2017). Contractual framework focusses on relationships of managers, stakeholders, and employees within the organization. According to Shook, Adams, Ketchen and Craighead (2009), the agency theory emphasizes addressing information and providing incentives within the organisation. Beyond the theory shed lights on conflicts arising from the organization through interests' groups that have subjective views based on contractual agreements that emerge from two parties. Conflicts within organisations arise because of disagreements on different forms of the contract to fulfil specific principles (Vollmar, 2015).

3.2.5 Institutional theory

Several authors have discussed numerous topics to reflect on institutional theory and construction (Bartley, Andersson, Jagger & Laerhoven, 2008; Levitt & Scott, 2017; Fligstein & McAdam, 2011). During this empirical study, the institutional theory is applied to examine the dearth of the construction industry in terms of its compliance to policies and best practices of the regulatory framework. Institutional theory was employed to explain the moderating impact on State services and to evaluate processes of State infrastructure for the provision of guidance that establish an acceptable social and institutional behaviour. The theory outlines principles that provided specific information on survival to gain credible legitimacy as every stakeholder in a construction industry needs to obey specific rules and systems that forms part of the prevailing climate.

The State's role is to facilitate and regulate, realise the influence on the construction industry. Enforcing the building code as applied in construction operations, the State institute strategies of risk management that addresses and streamlines compliance practices based on acceptance code of ethics and standards. The primary tenet of institutional theory is to help in explaining how firms seek to legitimize their activities by ensuring enough levels of conformity to details.

3.2.6 Contingency theory in the context of risk management.

Developing risk management strategies depends on several theories. The theory of contingency was described as one of the fundamental management strategies that is used in managing the nature of risk. While the construction is described to be complex, every project of construction features uniqueness and different risk factors that need quick management processes. The theory of contingency relates to thinking the uniqueness of the project environment of the construction industry to be able to identify every befitting tactic to address specific demand through critical strategies. Directing management techniques to curb risk within the industry should be appropriate based on specific project climate as every situation of project life cycle within the construction presents a particular unique issue that is industry related. The contingency theory argues that management issues need a single management approach (Ghahramanzadeh, 2013).

The theory considers interaction as well as interactions that exist between the general environment of the organization. This theory is applied to clarify the unique nature of projects with specifications, that needs appropriate management stance. Hence, a study by Gitau (2015) revealed that project management in any form requires variables that bears linkages for consideration. Contextual variables are some of the fundamentals that impact project objectives in different ways. These variables such as the external climate, technology, size, cost, the culture, and organizational structure. Other influential variables, namely the factors of risks also impact project management. The fact that contingency theory strongly rejects the views that “*no best approach*” proponents further agreed that the term “one most appropriate approach” for every recommendation is allowed (Ghahramanzadeh, 2013). Project climate is influenced by external factors; hence the effectiveness of the organization is known to be stricter interaction of organizational climate and the immediate environment (Smith & Osborn, 2000). Based on the construction industry throughout South Africa, the contingency theory is appropriate as it describes each approach in the management of construction risks.

3.2.7 The Fuzzy theory

Through the seminal work of Edwards and Holt (2010) the fuzzy theory was proposed with the aim to discuss “*fuzziness or uncertainty*” in the context of risk management processes during project operations. Uncertainty impacts every situation where it becomes necessary to apply cognitive of human judgement in making decisions. By extension, the fuzzy set the theoretical pathway to achieve logical conclusions for the useful applications of this technique is to assess every potential construction risk including operational activities of every project in the construction industry that needs prioritization (Edwards & Holt, 2010).

However, any activity that has been ranked to attain specific project objectives are based on critical evaluation of available resources such as expertise, skills, capital, and materials. Fuzzy logic illustrates differences between variables of risks and other types of risks factors to strictly impact the construction industry. Understanding the contents of fuzzy theory all risks and risk factors in the construction industry can be strategically planned and reduced for the realization of set objectives since each of the objective produces reliable and credible in the construction industry.

The fuzzy theory is one of the applicable theories in this study to explain the concept of risk management to give priority to the potential risks in the construction industry. The theory is designed as a framework that explains the differences in firm performances. Given the observation that entities operate in complex and unique climatic conditions that are limited by scarce resources, the contractors in the construction industry need strategies that stimulate operations and maximize values.

3.3 CONCEPTUAL FRAMEWORK

3.3.1 Risk and risk factors

Due to lack of definite assessment tools to rightfully identify risks during construction of projects, it is important that individual contractors continue to understand the depth of risks that plague the industry during operations. Many informal contractors largely remain dependent on specific “*rules of thumb*” to conduct assessments and analyse various risk factors to different construction projects (Chatterjee, Zavad, Tamosaitiene, Adhikary & Kar, 2018). These construction projects are likely to experience countless internal and external drawbacks due to several risks’ factors (Choi, Mogyoro & Pehrsson, 2011).

3.3.2 Defining the concept of risk.

Different authors and researchers have defined the concept of risk using several approaches (Walewski et al, 2006; Chia, 2006; Deng, Pheng & Zhao, 2014). The concept of risk originated from France as part of the general operational insurance tool that is applicable in England in late 1830s. At the time, the concept is referred to as known, unknown risk as well as minor changes that are predictive of tasks that are probable and improbable even (Smith, 2014). Defining risk varies based on several sources. However, the present study adopts risk definition from the Project Management Institute (PMI) (2013). According to the PMI (2013), risk entails doubtful events that create either advantages or limitations once occurred. Several researchers have defined risk in the past. Lester (2007) in a study defined the term “risk” as the probability of any task or event that emanates from negative outcomes. Construction climate projects are highly exposed to ongoing risks (Santos & Jungles, 2016).

The concept of risk is defined based on two different dimensions. Firstly, it is probable that specific risks will take place depending on existing conditions (Van Eck & Visser, 2012). Besides, it is argued that risk can also be defined as multiple occurrences of events and accompanying outcomes (Steyn, Carruthers, Du Plessis, 2012). According to Vaughan and Vaughan (2008), risk entails specific events in which there are possibilities of adverse departure from desired expected outcomes. Risk encompasses any form of events that are likely to influence forms of organisation's during project activities (Steyn et al, 2012). According to Barber (2005), risk is ongoing threats or uncertainty that adversely impact projects. Further study adds that the probability of occurrence of these events are not generally known due to different levels of uncertainties.

Risk is divided into three different parts. According to the King IV Code, the parts include "*uncertainty of events*", "*the likelihood such events occurring*", and "*the positive and negative effects*" on the events. Risk is referred to as that concept of uncertainty that affects a given objective (The International Organisation for Standardisation, (IOS) 31000). In sum, the concept of uncertainty features highly in defining risk (Berg, 2010; Duong, 2013). Every form of business attracts risk in any form. The construction industry is no exception. The concept of risk as defined entails the decrease in business assets values depending on internal business activities or the external climate (Aven & Renn, 2009; Marx & De Swardt, 2013). Further definition by the International Organisation for Standardization (ISO) (2009) adds that there is risk when challenges of exposure, frequency or the probability of risk become unknown. Thus, without the least probability of risk, there would be no risk to operate a business venture (Shpak, Sorochuk, Hvozdz & Sroka, 2018). Therefore, classification of risk varies from purity, control or the risk of opportunities (Hopkin, 2018).

Opportunities risk or speculative risk is part of the business processes with focus on the organizational function (Borghesi & Audenzi, 2013). Pure or control risk need to be identified and be insured against losses (Vaisamakis et al, 2013). Business risk management plays a crucial role in business success and its competitive advantage for the creation of awareness and to gain opportunities while reducing the level of threats and providing constant feedback (Diedericks, 2015; Watson, 2009). Establishing risk management systems and procedures consume time and a labor-intensive exercise (Gwangwana et al, 2014). To overcome these challenges, this mixed research aims to explore the risk factors of informal contractors in the construction industry in selected municipalities operate. Some of the words that are linked to

risk include perils, threat, vulnerabilities, uncertainties, and hazards. Yet, in this study risk is defined as uncertainty that impacts the general operations of the construction industry in informal economy where informal contractors as defined earlier in the study operate.

3.4. The general perspective of risk.

There are several aspects that impact on how risk is perceived and dealt with in a particular setting. For instance, uncertainty plays a critical part during opinion making processes (Brashers, 2001). Accordingly, as individuals act in a complex, unpredictable and conditions that cannot be predicted, the individuals are faced with high levels of risks (Brashers, 2001). According to Powel et al (2007), uncertainty is linked with specific aspects that impact individuals risk response towards decision making. Gaskell and Allum (2011) posit that perception regarding risks should be viewed to be subjective as individuals are faced with feelings.

The general perception of risk is an expert's opinion for the expression regarding risk to indicate the likelihood that specific risk to occur (Backhaus, Klaus & Margit Meyer, 1984). Previous studies have indicated factors that contribute to the risk perceptions namely attitudes, judgements, feelings, educational background, practical experiences and the quality and the amount of information available (Akintoye & McLead, 1997; Chaffray & Johnson, 1977; Ritchie & Marshall, 1993). According to Backhaus et al (1984), risk perception has been the general expression of experts about the probability that specific risk is likely to occur.

3.5 Empirical study on risk and risk management in different countries

Risk management and risk factors identification have been researched in different countries across the globe (Grace, 2010; Davis, 2017; Chandra, 2015; Ling & Li, 2012; Motaleb & Kishk, 2015). These researchers and authors conducted the study with the view to categorize every form of risks. Wilson (1982) in an earlier study assessed the roles of individual artisans including engineers and architects to resolve claims out of construction projects. Reasons for such claims were the resultants effect of extra work delays in projects, no management, no access to site and work schedule changes. A study in Ghana by Frimpong et al (2003) among clients from private and public sector, contractors and consultants using 26 delay factors and cost overruns revealed that payment constraints, poor management of contract projects and

procurement materials. Regarding the causes for project delays in the Iranian project construction industry, a study revealed that the causes were poor management and supervision, consultants, and sub-contractors' challenges, unable to produce design documents on time, below expected contract management (Pourrostan & Ismail, 2011). The study further identified other risk factors that impact negatively were time and cost overruns, issues of litigation as well as total abandonment. Further empirical study in Kuwait and Bahrain found that the primary contributors to delay in project completion were identified as order changes by clients, specification order changes, poorer decision-making developmental stages and changes to regulations and laws (Altoryman, 2014). An investigation into the factors of external environmental risks in Nigeria revealed that economic, social, political roles contribute to success in the construction industry (Musa et al, 2015). In terms of financial risks, Fernando et al (2017) in a study involving professional contractors revealed that the most outstanding factors include variations in material prices, rates of exchange, interest rates and shortages of materials. Thus, risk knowledge acquisition of the construction risk is critical (Fernando et al., 2017). Figure 3.1 below provides a general but specific summary of most risks as well as other important outcomes by demonstrating higher identification and individual characterization of construction risk.

3.6 Overview of risk factors

The present study's theoretical framework is borrowed from different but related scientific works by Wong and Cheung (2005) and Chaudhry et al (2004) which provides an in-depth descriptions of risk factors constructs that together outline 6 key dimensions of risk factors. The factors are identified in figure 3.1 on the following page as financial, technical, management, environmental, political, and physical risks.

Figure 3.1: Six key dimensions of risk factors impacting project operations.



Source: Design for the study.

Risk factors have been defined by several researchers in the past (Mbande 2010; Wong & Cheung, 2005; Ibrahim et al, 2012). For instance, previous surveys indicated that risk factors entail financial losses among others that was suffered by contractors that work in a very harsh climatic conditions, defective project designs, suffer payment delays and closures (Mbande 2010; Ibrahim et al; 2012). The impact of risk on the performance of projects point to finance distress as one of the primary risk factors (Dada & Jagboro, 2007; Hassanein & Afifa, 2007). Financial risk is categorized as credit ratings supply of capital, flows of cash and rates of interest (Edwards & Bowen, 1998).

As explained by Manelele and Muya (2008) technical risks entail the failure of design systems and equipment, collision, and accidents of any form. These factors arise during the construction of projects in the construction industry. They are classified under technical skills of contractors. According to Xu et al (2010) and Vidivelli, Vidhyasagar and Jayasudha (2017), are mainly of technical dimensions and very difficult to manage. These are risks that are inadequate due to new technology (Mahendra et al, 2013; Iqbal et al, 2015; Chaudhry et al, 2014). Further definition by Santoso et al (2003), argued that technical risks are sub-divided to include technique, equipment and processes and sites of constructions. The construction industry is faced with varying forms of risks including inflation and the growing fluctuation of exchange rate. While there is no agreement in defining financial risk, literature indicated that there are

growing financial implications that bear significant linkages with specific project risks (Guo, Li & Zhang, 2016).

The factors of risk could be through internal or external as project operations commences. For projects to become successful and to meet clients' requirements and project objectives, it is key to know and understand after all the potential risks are identified and planned for (Smith, Flowers & Larkin, 2012). There is no definite agreement in defining financial risk. Financial risk focuses on monetary matters that are controllable. These factors are classified under price increases, rate of foreign exchange, localized taxes, rates of foreign exchange and payment delays (Kikwasi, 2012; Chileshe et al, 2012; Mahendra et al, 2013). However, for the purpose of this study, the three forms of the definition of economic risks namely inflation, price fluctuation as well as sub-standard financial marketing processes would be adopted (Shunmugam & Rwelamila, 2015). Defining environmental risk entails three primary variables. Environmental risks are uncontrollable by managers. Factors such as natural disasters, weather, and seasonal implications (Kuo & Lu, 2013; Chileshe et al, 2012; Zou, Zhang et al, 2011). Recent study by Wang et al (2004) assess risks by identifying several forms of risks that impact project constructions.

According to Tchankova (2002), the overall environmental risks are acknowledged to severely influence individuals' ability to perform project tasks in the industry. performing tasks demand supervision and management skills. Edward and Bowen (1998) indicated in previous study that managerial risks enable task performance to demonstrate the depth of quality assurance, human resource management, cost control measures and heighten productivity levels. Aje et al (2009) in a similar research work argued that the reliance on clients during the project execution including consultation levels further contributes to operational risks. Hassanein and Afify (2007) agreed that lack of adequate project management experience further adds to the growing nature of project risks that impede operations within the construction industry. Other researchers including Manelele and Muya (2008) in a study stated that human resource management and managerial risks contribute to risks during project operations.

Another form of risk that impacts the construction industry includes government and political risk. Political risks entail the factors of changes in existing laws and regulatory framework, law and order relating to corrupt practices and bribery (Xiaopeng & Pheng, 2013; Odimabo & Oduoza, 2013). According to Lester (2007) organisations display various forms of risk

including internal politics that manifest through broad opinions and attitudes of stakeholders. Thus, the ruling political party can impact organisation's performance in different ways (Tchankova, 2002). Ali and Kamaruzzaman (2010) argued that contractors in the construction industry primary sources of risk include the handling of regulations as government change existing policies due to democratic principles through elections. The construction industry further experiences three types of relationship risk in the form of poor systems of communication and inefficient coordination (Lester, 2007). Prior studies by researchers have asserted that any advances by stakeholders in terms of project relationship can result in serious risks with negative or positive consequences.

Furthermore, the construction industry suffers increasingly from security risks due to rampant theft on sites, accidents as well as injuries (Kheni et al, 2008). To ensure such security risks are minimized, the construction industry encourages employees to utilize equipment such as helmets, reflectors, steel, working boots, gloves, and different protective wear during operations. The industry is further marred by physical risks such as damage to equipment, heat and radiation, labour injuries and noise (Feng, Zhang, and Wu, 2015; Jacobsen, Johnsen, Gravensen & Schvsho, 2015). One needs to draw an overarching distinction between the perception about risk and human attitudes towards risks. Organisations accept different degrees of risks based on attitude (Project Management Institute, 2013). Lehtiranta (2013) indicates that perceptions of risk are some of the functions of humans, beliefs, judgement, and personal feeling.

Additional study by Wand and Yuan (2011) further described the significance of risk perception and the overall attitude to efficient risk management. The study further identified factors that impact the risk attitudes of contractors within the construction industry. Small construction projects in South Africa suffers from risks and risk allocations. Past studies indicated that risk in most cases was not allocated to individuals based on best management skills practices during project operations (Lehtiranta, 2013; Adams, 2008). The study equally stated that small construction projects with an employment volume of 69% are not able to manage risk in the industry. Table 3.1 below further illustrates the construction risk factors based on extant literature reviewed throughout this study.

Table 3.1: Risk factors of the construction industry

Category of risks	Specific risk factors
Financial risks (Uncontrollable; Monetary issues)	Payment delays; Cash flow constraints; Lack of financial resources; price increases, localized taxes, and foreign exchange.
Construction risks	Poor workmanship; location/site safety; Insolvency of sub-contractors, shortages of materials/resources; late material deliveries, harsh weather conditions; faulty construction techniques.
Design	Substandard design, change of scope.
Environmental risks	Pollution; compliance with the law; environmental issues
Politics/contract provision	Change in law/regulatory framework;
Managerial risks	Human resource management; cost control measures; heighten productivity
Relationship risks	Poor communication systems.
Operational risks	Inadequate system; faulty controls; human mistakes; incompetent workforce; incorrect processes.
Human resource risk	Shortages of skills; data issues; behavioural risks; compliance, regulatory risks.
Functional risks	Legal risks (employment law; health and safety; environmental; non-compliance; contractual failures; management errors).

Source: Adapted from PMI (2013)

3.7 Sources of risk

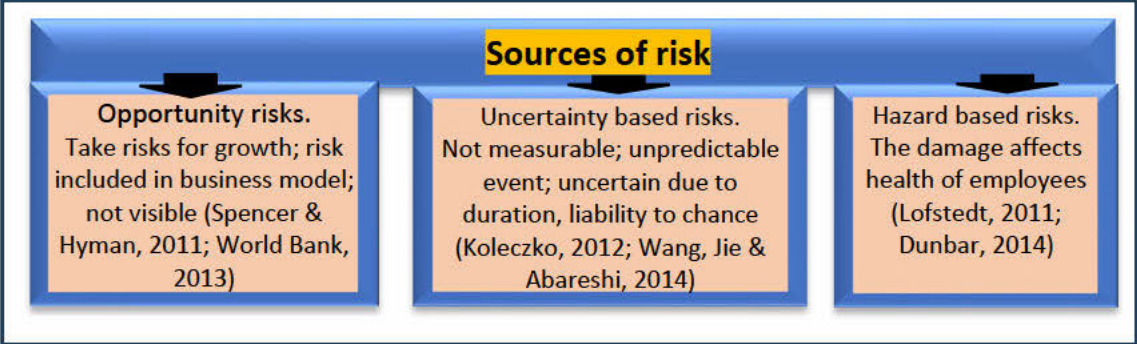
Irrespective of the sources, nature and the type of risks need to be properly managed to enable the entity to achieve the expected objectives. According to Ghahramanzadeh (2013), project related variables such as time, scope, costs, safety requirements as well as the environmental criterial should be efficiently defined. Ehsan et al (2010) argued that there is the likelihood that during operations, specific factors contribute to the detriment of the project.

Organisations that are formed for-profit or non-profit motives operate business activities in a similar inflationary, high currency deficiency and rising unemployment among the youth. These organisations faced the challenges of high-risk tolerance that impact potential growth. Risk is known to emanate from three different types of events. One of the motives of organisations is to look for opportunities in the business climate. In other words, organisations are established to *“take opportunity-based risks daily as such organisations are creative, inventive, and continue to succeed despite the changing business environment”* (Spencer & Hyman, 2011).

Risks according to the World Bank (2013) study entail taking part in risky ventures that are likely to attain their objectives to growth as they take advantage of potential opportunities.

There are closer relationships between the twin concepts of risks and opportunity with the majority decisions and steps taken by the organization to improve operations as the organization take advantage of potential opportunity in the immediate environment besides the managing the inherent risks that forms part of business model (Jayasudha & Vidivelli, 2016). In sum, the term uncertainty can be described as business risks that are unmeasurable, unpredictable as well as uninsured outcomes (Wang, Jie & Abare-Shi, 2014). Other scientists argued that the concept of uncertainty cannot be based only on randomness of events rather is based on behaviour and individuals’ beliefs. Finally, among the three types of risk the “*hazard-based risk*” is referred to as the most common risk that is linked with the management of small businesses (The Global Risk Alliance and Department of State and Regional Development, 2005). According to Kazmierczak and Cavan (2011), hazard-based risk forms the most significant part of any form of health and safety initiatives. Figure 3.2 on the following page depicts these risks for deeper insights to determine their effect on project operations in the construction industry.

Figure 3.2: Different sources of project risks



Source: Researchers own work.

The risks stated in figure 3.2 are linked to empirical studies from various sources because they revealed significant impact on different construction projects within the construction industry. These risks are shared among consultants as well as the contractors in different finance-linked internal and external climatic conditions that require proper management processes to consider the necessary financial aid to sustain the construction industry.

3.7.1 Opportunity-based risks

Opportunity-based risks entail measures that necessitate taking advantages based on growth related activities (World Bank, 2013). According to Rojas and Aramvareekul (2011), smarter firms take opportunity-based risks daily. Such firms are capable of being incentive, creative and continuance to stimulate growth and succeed in a never evolving climate. There are adequate similarities between risk and opportunities as decisions are made and potential actions taken to improve as well as to take advantage of opportunities at the same time, managing the inherent risks within the business model (Jayasudha & Vidivelli, 2016). In contrast, there are risks that seem to bear high level of opportunities, yet taking advantage of those opportunities is likely to result in complete failure that may lead to higher risks. The Global Risk Alliance and the Department of State and Regional Development (2005) affirms that one of the primary barriers to opportunity-based risk entails specific risks that may or may not provide adequate visibility in the environment.

3.7.2 Uncertainty-based risks.

In the present working climatic conditions, one of the primary roles of a manager is the ability to well-manage risks and uncertainties. The concept of “uncertainty” which focuses on duration, occurrence, liability to related chances of an event occurring. Koleczko (2012) adds that concept of uncertainty is largely based on uncertainty, randomness, and belief patterns as well as behavioural traits of managers. Wang, Jie and Abareshi (2014) defined uncertainty as any form of business-related risk that are unmeasurable and lack the requisite predictions.

3.7.3 Hazard-based risks

According to the American Chemical Society Report (2015), any potential harm, adverse health impact on human in general is characterized as a hazard-based risk. In addition, the Global Risk Alliance and Department of State and Regional Development (2005) report on small businesses, hazard-based risks entail the risks that are associated with business risk management that are normally addressed through the establishments’ department of occupational health and safety initiatives (Love, Davis, Ellis & Cheung, 2010).

3.8 Risk factors from empirical sources

The table below detailed different risk factors that were sourced from extant literature with various authors. In all the major risks that impact project operations within the construction industry were outlined from policy risks to undue clients' interventions.

Table 3.2: Risk factors from empirical studies

Risk factors	Sources based on empirical literature
Maintain state policy framework policies relating to construction industry	Ismael and Shealy, 2018; Zou, Zhang, and Wang, 2011
Inaccurate cost estimates	Ismael and Shealy, 2018; Qin, Mo and Jing, 2016; Zhao, Hwang and Gao, 2016.
Delays and longtime payback	Gurgun, Arditi and Casals Vilar, 2016; Ismael and Shealy, 2018.
High cost of materials and equipment	Hwang and Ng, 2013; Ismael and Shealy.
Lack of expertise and management within the industry	Zhao, Hwang, and Gao, 2016.
Unattainable requirements and expectations	Hwang et al, 2015; Gurgun Arditi and Casals Vilar, 2016.
Issues of culture	Kasapoglu, 2018.
Poor and inadequate communication among stakeholders	Zou and Couani, 2012; Qin, Mo & Jing, 2016; Zhao, Hwang, and Gao, 2016.
Complex processes and specifications	Zou and Couani, 2012; Qin, Mo, and Jing, 2016; Zhao, Hwang, and Gao, 2016; Hwang et al, 2017.
No practical experience among the workforces.	Qin, Mo, and Jing, 2016; Ismael and Shealy, 2018.
Uncertainty in performance quality and materials	Alpine and Valdes, 2017.
No technical expertise.	Zou and Couani, 2012; Hwang and Gao, 2016.
No knowledge of public awareness	Ismael and Shealy, 2018.
Unforeseen project needs	Qin, Mo and Jing, 2016.
Incorrect design data/information	El-Sayegh et al, 2018; Qin, Mo and Jing, 2016; Zhao, Hwang and Gao, 2016.
Tight schedule for contractors.	Alpine, Valdes, 2017; El-Sayegh et al, 2018.
Litigation issues and challenges, no expectations	Tollin, 2011; Qin, Mo and Jing, 2016.
Inexperience project team and workforce	Ismael and Shealey, 2018; Zhao, Hwang and Gao, 2016.
High insecurity	Paradis and Tran, 2016.
Corruption and high crime rates	Zhao, Hwang & Gao, 2016.
Fluctuation in exchange rates/inflation.	Zhao, Hwang & Gao, 2016; Qazi et al, 2021
Design changes.	El-Sayegh et al, 2018.

Ambiguous contract information/disagreements and unclear dispute processes.	Zhao, Hwang, and Gao, 2016.
Safety and health issues	Fortunate et al, 2012; Cardoso et al, 2019; Zou and Couani, 2012.
Lack for product demands	Durmus-Pedini and Ashuri, 2010.
No political assistance	Ismael and Shealy, 2018.
Expensive construction costs.	Hwang et al, 2017; Ismael and Shealy, 2018.
Undue clients' interventions.	Zhao, Hwang, and Gao, 2016.

Source: Compiled by the researcher

3.9 Classification of risk

Based on the Institute of Management Accountants (IMAs) report of 2007, the classification of risk is in four sections of risks namely routine, low importance, difficult and critical risks. The table below illustrates the various classifications of risk that influence operations in the construction industry. These classifications further reveal that discussions on risk and risk factors followed both the qualitative and quantitative approaches for clarity to enable better and informed decisions to be made by role players within the construction industry. The classifications applied in the table are based on the impact of different risk factors on the construction industry. Successful management of risk depends on several processes including identifying the risk, classification, attitude, and level response by stakeholders in the industry (Perera, Rathnayake & Rameezdeen, 2008). Table 3.3 on the following page provides a summary of the different risks and risk factors that impact the various construction industry; thus, impacting adversely on the construction industry in informal economy.

Table 3.3: Classification of risk and risk factors

Context	Risk classification	Benefits of risk	Source
Generate incorporation of projects	Contractors; sub-contractors; socio-political; cultural	Putting together expert knowledge and experiences. No financial factors to be included.	EL-Sayegh, 2008
Literature review	Project risk classification: socio-political; financial/environmental,	More inclusive, wider ranging factors such as the technical and financial risks.	Mahendra et al., 2013.

	technical & construction.		
Built climate	Execution, management, supplies and engineering	Construction project; initial project execution.	Nieto-Morote & Ruz-Vila, 2011
Project construction; developing questionnaires & Interviews	Financial; design; management; contractual; health and safety.	Can be applicable to understand quantitative and qualitative concepts. However, the study lacks in explaining physical factors and suppliers.	Choudhry et al., 2014.
Projects in the construction sector; design; engineering and interviews.	Project risk; financial; external climate; procurement and administration.	Study is based on classification of financial variables.	Vu et al., 2016.
Ecological hazards	Physical factors	Harmful to contract or non-contractual projects.	Iqbal et al, 2015; Feng, Zhang & Wu, 2015.
Law/regulations and order; corrupt practices.	Socio-Political	Overcome local national, political opposition.	Xiaopeng & Pheng, 2013; Odimabo & Oduoza, 2013.

Source: Compiled by the researcher.

3.10 Overview of empirical study of risk factors in the construction industry

Several authors from different field of study have researched on safety, performance, costs, and time as risk factors within the construction industry (Fortunato, Hallowell, Behm & Delaney, 2012; Choudhry et al, 2014; Mohamid, 2013; Katre & Ghaitidak, 2016). Others focused their research on the life cycle of projects rather than understanding the different aspects of a project (Tserng, Yin, Dzeng, Wou, Tsai & Chen, 2009; Renuka, Umarani & Kamal, 2014).

Every form of project operations in the construction industry is marred not only with unpredictable risks but also a unique task founded on proficiency to an acceptable outcome. As a result, any form of risky and incorrect risk policy framework applied in the construction firms to mitigate challenges is likely to contribute to project failures (Branco, 2015). Past study demonstrated that through project planning, well-organisation and efficiency of project management operations become successful as each construction project happened in a multifaceted climatic condition. Hence, every risk source requires ongoing control measures and monitoring procedures to render quality projects and attain its objectives (Choudhry, Aslan, Hinze & Arain, 2014).

Negative results of risks in the construction industry cannot be ignored. Risks impact different aspects of the industry including stages of productivity, level of performance as well as the project quality. As Apolot, Alinaitwe and Tindiwensi (2011) stated, construction risks increase project costs to the value of roughly 53%. The rampant occurrence of any form of risk in the construction industry has resulted to more vulnerable not only to risk but other forms of uncertain events (Ringen, Van Duivenbooden & Melius, 2012). Due to its rapid occurrence, construction risks throughout the industry are perceived to be highly unsafe in contrast to other industries.

For instance, recent study by Ringen et al (2012) identified personal risks due to injuries in the construction industry significantly high. In addition, industry is impacted by risk factors of education and management. These risk factors according to a survey need to be one of the vital prerequisites to the commencement of every construction project (Zhao, Liv & Zillante, 2010). Furthermore, the different phases of project operations namely the scope, location or project types need serious considerations for the project to become successful (Hwang et al, 2017).

Previous studies have shown that some risk factors are linked to construction projects. These include financial failures of contractors, harsh working conditions, industry closures, delayed contract payments, and defective designs (Mbande 2010). Other risk factors include the difficulties to access construction site, lack of consistency, incorrect quantities as additional significant risk factors. According to Ibrahim et al (2012), projects from the construction industry are linked to factors such as financial, political, and other social risks that impact the estimate profit margin of the owner. Other risk factors according to the study are listed with brief explanations as outlined in table 3.5 below.

Table 3.5: Summary of different risk factors

Risk factors	Brief explanations
Design	Uncoordinated designs, defective designs, incorrect quantities, drawings and specifications, awarding designs to unqualified designs, defective designs.

Logistics	Labour unavailability, unidentified project scope, materials, shortages of equipment and spare parts, inefficient communication (field office and home).
Political	New acts and legislations due to change of government, unstable security circumstances
Issues of construction	Gaps between implementation & specification, potential rush during bidding processes poor work quality due to time constraints, design changes, changes and real quantities which differs from contract quantities.
Management factors	Poor planning due to complex project nature, sub-standard (poor), management of resources, shift in management strategies, poor communication between project manager, project team and related stakeholders.
Legal factors	Difficulties to access working permits, unclear work legislations, legal pursuits during construction phase inability to access specialized arbitrators.

Source: Researcher own compilation.

3.11 Important risk factors impacting the construction industry.

Different scientific arguments were advanced in the past regarding different risk factors identification and their importance in the construction industry (Zhang, 2011; Xiaopeng and Pheng, 2013; Eybpoosh, Dikmen and Birgonul, 2011; Deng et al, 2014). According to Smith, Merna, and Jobling (2014), risk identification was not possible even after the project is completed because each project follows a steady processes of learning curve which expose the actual risk that emerged during the project operations. There is immense significance once risk factors are identified because the process of identification entails a clearer understanding of every construction activity in the construction industry (Aven & Zio, 2014). Political and financial risks are some of the most important variables in the industry (Du Toit, 2013; Lee et al, 2011). Al-Shibly, Lousi and Hiassat (2013) argued that operations within the construction industry continued to be challenged by several risk factors that in essence creates the climate for negative industry outcomes if not well-managed. Further study has argued that due to its multidimensional nature, political risks create significant impact in the construction settings

(Quer, Claver & Rienda, 2011; Jakobsen, 2011). To ensure the maximum significance of the various risk factors, researchers are of the views that risk identification needs to start first by determining the risk factors of political, technical as well as performance related risks (Borghesi & Audenzi, 2013; Aven & Zio, 2014).

While the larger construction industries need to handle every form of risks with greater care, informal contractors in the formal economy need to take on excess risk factors to remain afloat. According to Hopkin (2018), the informal contractors who operate are unable to fully identify every form of the risk factors that impact the industry, thus creating a high level of vulnerability. The Small Enterprises Development Association (SEDA) (2016) explained by citing the trivial capabilities of informal contractors that make it impossible to take on more financial risks due to insufficient skills to bargain. The severity of different risk factors can be avoided once the processes of managing risks involve different structures in the industry to conduct an efficient system of planning, organizing, leading and controlling (POLC) (Du Toit, Erasmus and Strydom, 2010). For instance, proper management of the risk factors such as lack of productivity, client dissatisfaction as well as increase in materials can become very beneficial in reducing production costs and increase in project quality to stakeholders (Baloyi & Bekker, 2011). However, several surveys in the past have identified project delays to rampant and inadequate levels of communication in the industry (Seddeeq, 2019; Ruqaishi & Bashir, 2015; Abdul Nabi & El-Adaway, 2012). Similar study in Nigeria found that delays in construction projects are caused by lack of adequate information to professionals in the industry (Kukoyi et al, 2021).

Several risk factors that impact on project operations in the construction industry have been researched and documented (Tipili & Ilyasu, 2014; Chileshe & Yirenkyi-Fianko, 2012). According to Tipili and Ilyasu (2014), the construction industry in Nigeria is believed to face the risks of cost overruns as well as the delivery of projects within the budget timeframe. Other risk factors that continue to influence the industry in order of significance in terms of costs of projects in the industry. The risk factors in the order of significance were variations in design, client's variation, inflationary periods, erroneous cost estimates and incorrect programme scheduling. Risk factors that are related to timeframe in the order of importance were as follows, bureaucratic practices of the State, variation delays, performance quality, very tight project plans, changes in construction programs. From quality perspectives, the study highlighted that the risk factors of quality that affect the construction industry in order of significance include

very tight project schedule, variation in project designs, inability to coordinate between project team members, lack of contract program planning and unskilled workforce (Tipili & Iiyasu, 2014). Regarding cost related impact, the survey by Tipili and Iiyasu (2014), further add that incomplete estimate costs, insufficient planning of programs, changes in clients designs and inflationary rates contribute to negative impact on project operations in the construction industry.

Subsequent survey by Chileshe and Yirenkyi-Fianko (2012) in which 25 risk factors impacting the construction project performance operations in the construction industry. The study focused on the performance and delivery in relation to project costs, time frame and quality. Out of 25 risk factors, the participants (clients, consultants, and contractors) stated that the five most impacting risk factors were fluctuation in prices, payment delays, rate of inflation, poor financial markets, and performance as well as quality. However, the study further adds that the most impacting risk factors were inflation, quality performance control, payment delays and fluctuation in prices. According to Kuo and Lu (2013) and Chileshe et al (2012), environmental risks namely seasonal and natural disasters are difficult to control and manage in the construction industry. It is further argued that physical risks such as ecological hazards can cause substantial adverse impact to contractual projects and otherwise (Iqbal et al, 2015; Feng, Zhang & Wu, 2015). However, project managers are required to prepare well for other physical risk factors such as heat, radiation, labour injuries including the level of industry related noise and ongoing radiation levels has negative influence on the industry (Jacobsen, Johnsen, Gravensen & Schovsbo, 2015).

3.11.1 Delays of construction projects.

The delays of construction projects are not only the challenges of developing countries as this phenomenon is equally one of the issues the developed countries are faced with daily (Subramani, Sruthi & Kavitha, 2014). Empirical surveys conducted by project professionals and other researchers revealed the causes and the negative impact on project operations by risk factors in the construction industry (Ogunbayo, 2014). As Ansah (2021) explained, project delay and the date of completion continues to experience grave negativities despite the recent advent of technological innovations in the construction industry and deeper insights into newer project management techniques. Some of the most significant contributory risk factors to

project delays include payment delays, issues of contract modifications, economic challenges, and incorrect financial processes (Rastogi & Trivedi, 2016).

Similar study in Vietnam regarding project delays in project completion revealed further risk factors namely financial constraints by contractors, contractors' incompetency, and contractors' inefficiency (Kim et al, 2016). Professionals in the construction industry are of the view that significant variations affect project operations directly and indirectly due to lesser productivity in the industry (Aziz, 2013). The study further argued that ongoing decreased productivity in the industry was due to rising poor management by contractors (Aziz, 2013). The final report that was commissioned adds that minimal productivity can be blamed on project owners and designers in the construction industry. Construction projects can further be delayed by several other risk factors due to lack of proper surveillance and early detection and identifications (Mahendra et al, 2013). Below are some of the risk factors that were documented to have significant influence on projects' success within the construction industry.

3.11.2 Price fluctuation of construction materials

Price stability of goods and services is the primary concern of the developing and the developed countries. However, this plan of price instability continues to impact on construction materials due to persistent incidence of inflationary periods across the developing countries (Oghenekevwe et al, 2014). Price fluctuations in building materials such as cement, sand, timber, roofing materials, fixtures of sanitation continue to pose significant threats to the construction industry thus creating heighten vulnerability in the industry. Building material costs continue to escalate to record high prices in the industry due to inflation of 60% to between 35-45% of the overall project costs (Al-Sabah, 2012). The rising inflationary prices in materials was deeply concerning to contractors and project owners (Ling & Hoi, 2006; Eybpoosh et al, 2011). According to Idoro et al (2010), about 50-60% of the total project costs consist of building materials and roughly 80% of the project schedule timeframe allows for specific projects to be completed on time. Idoro et al (2010) further add the growing costs of building materials has significant "*knock-on*" effect on the industry's completion dates allocated for projects. Inflationary rates are noted as one of the risk factors that impact the construction industry contribute to rising overall project costs (Idoro et al, 2010; Eybpoosh et al, 2011). Construction contracts like other industry contracts suffer from inflationary prices of materials because of changes in fixed contract prices. The implication is that clients would not be ready

to accept contract price increase because of price fluctuations of labour and other building materials (Idoro et al, 2010; PMBOK, 2013).

3.12 PROJECT RISK MANAGEMENT IN THE CONSTRUCTION INDUSTRY

Risk identification is the fundamentals of risk management (Ansah & Sorooshian, 2017). According to Asadi (2015), identifying the type and nature of risk is a process that aims to conduct risk detection procedures that affect project operations. Understanding the depth of risk impact on projects leads to the capturing and accessing various risk documentations that relate to specific projects to ensure successful project operations (Elmhedwi & Elmabrouk, 2015). Risk identification in the construction industry entails different tools. One of such tools is the risk register, the checklists for planning and interviews (PWC, 2014). Risk identification is important in the construction industry as organisations utilize different approaches to identify project risks. As Carvalho and Rabechini (2015) explained, ineffective risk identification processes yield negative outcomes such as overruns of costs, poor project quality as well as delays of projects schedules.

It is very rewarding to conduct the processes of project risk identification during the initiation phase prior to commencement of operations (Taroun, 2014). This process can be conducted through the qualitative or the quantitative approaches depending on the project type and the available information (Firmenich, 2017). However, due to the nature of the construction industry, the processes of identification must be frequent and ongoing because the industry continues to evolve (Carvalho & Rabechini, 2015). In conducting risk identification, it is essential to further assess the sources of each project risk to develop sufficient risk knowledge during the risk planning stages (Renuka, Kamal & Umarani, 2014).

3.12.1 Risk identification

Risk identification is an iterative process employed during project operations (Project Risk Management Handbook, 2017). It is that stage where the initial phase of the management of risks begins to be executed that finally results in losses due to lack of profitable business events (Aven & Zio, 2014). According to Aven and Zio (2014), risk identification needs an in-depth understanding of business activities that are without technical and legal shortfalls. Prior to the

management or the stages of risk assessment, risk is perceived as the relevant action that need to be taken to manage business operations (Marx & De Swart, 2013).

To ensure enough and reliable analyses and to efficiently identify possible risks one needs to conduct an identification process (Van Well-Stam et al, 2004). Burke (2010) asserts that the processes of identifying risk represent events that are ongoing provided the entire process is used effectively. Because of the dynamic and complexity of the construction industry, it is common that losses are bound to dominate operations. As Vaughan and Vaughan (2010) indicated, it is essential to identify risk during the early stages to curtail the impact of risk. According to Van Well-Stam et al (2004), Identification of risk requires some analysis to lead to a thorough analysis of risks in the industry. The form of risk analysis used should be an ongoing event as the industry is complex and continues to evolve (Burke, 2010). Project failures are linked to poorer display of trade men's skills, budget mismanagement, unreliable deliverables.

Vermaak (2006) remarks that instituting early stages contingency project strategies prevent potential delays and reduce breaks in project operations in the construction industry. In sum, to be able to conduct an efficient identification of risk processes, factors such as political, technical indicators, business performance standards and opportunities for business cooperation are required (Borghesi & Audenzi, 2013; Aven & Zio, 2014). The significance of risk management planning cannot be left unnoticed. Several researchers assert that identifying risks forms the fundamental in the risk management process (Makombo, 2011; Rehacek, 2017; Zavadskas et al., 2010). Risk cannot be properly controlled and minimized without identification (EL-Sayegh, 2014; Chihuri & Pretorius, 2011; Schieg, 2015). To ensure better presentation of risk management, the Risk Breakdown Structure (RBS) is employed to group and identify risk through the bottom-up approach (Mehdizadeh, 2012).

3.12.2 Assessment of project risks.

The construction industry is known to have poor risk assessment process in contrast to other industries (Renuka et al., 2014). Once a project has been identified, it becomes very difficult to cancel the detected risks rather it is feasible to either reduce, transfer, or evade the potential risks (Taroun, 2014). According to Altoryman (2014), project risk assessment should provide the extent to which the identified risks impact on project objectives, the probability of risk

occurring in the future and the approach to contain the potential risks. Thereafter, the assessment of risk is designed to provide classifications and the risk quantification depending on the severity and impact (Elmhedwi & Elmabrouk, 2015).

There are various factors that are used in the construction industry to assess project risk throughout the life cycle of every project since the processes of risk assessment need to be ongoing activities (Li & Packianather, 2017). The key factors are applied to assess project risks include the nature, origin, the consequences, the level of control and detectability of the risk (Lmoussaoui & Jamouli, 2014).

3.12.3 Communication

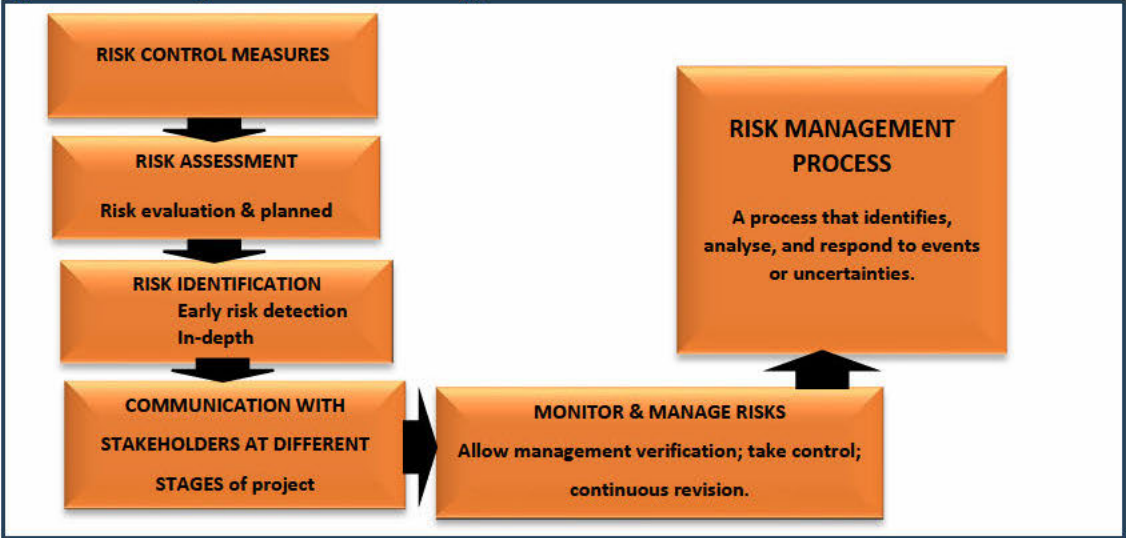
It is globally acknowledged that lack of communication or inability to communicate can impact severely on project operations. Communication is critical in project management within the construction industry. Communication should be conducted in a transparent and timely function with utmost clarity among project clients, contractors, suppliers as well as project team members. Daily, the project team members need to agree with various sectors of the industry for insights into the risk factors including different clients' project needs (Nehwani, 2018). According to Cart Wright (2018), it is important that the construction industry apply an active communication system that updates and manages various stakeholders and provides adequate feedback in the industry.

3.12.4 Project risk monitoring phase

The risk monitoring phase of project in the construction industry starts sooner after the identification and assessment phase. Responses to these patterns of risks is mainly traced through the monitoring processes (Al-Jibouri, 2014). During the process of monitoring, new and residual risks are identified (Altoryman, 2014). In the construction industry issues of cost, quality and time frame constraints are key contributors to risks. Monitoring every form of risk could give better and more efficient response strategies toward addressing and controlling project risks (Asadi, 2015; Clark, 2016). Further explanations by ISO 9100:3200 (2015), add that monitoring risks and subsequent review are one of the key elements of the construction risk management processes.

According to Clark (2016), within the construction industry, risks that are unidentified turn to become opportunity. As such, anticipated project risks impact less on project operations within the industry in contrast to unanticipated risk (Mullner, 2016). In sum, the processes of monitoring risk are required to provide a plan of response to risk in the form of contingency plan that is designed to address potential risks in the industry (Asadi, 2015). Figure 3.3 below displays the RBS in various risks groups, categories of risks and risk events.

Figure 3.3: The process of risk management.



Source: Adapted from Kishan et al (2014)

3.13 SOUTH AFRICAN ECONOMY AND THE CONSTRUCTION INDUSTRY

The recent global economic meltdown has dire consequences on the world’s macro-economies (Baccaro & Pontusson, 2016). As a result, the global economy is faced with challenges such as high unemployment rates, growing inequality, and high public debt, rising dependent on social subsidies (Kyriacou, Muinelo-Gallo & Roca-Sagales, 2015). These challenges have triggered the need for government intervention through direct implementations of economic policies to create stability for developing countries including South Africa (Deeming & Smyth, 2015). Given its unique constraints in the areas of political and social past, South African economic activities remain very weak for the past two decades averaging around 2.77% annual growth rate (StatsSA, 2018a). To ensure that the current economic growth, improve living conditions and reduce rising inequality, the State instituted the chief economic policy measures through the strategy of The National Development Plan (NDP). The primary objective of the NPA is to

shift the economy from rising expenditure and more investments to attain greater economic prosperities (National Planning Commission, 2013).

Like other developing worlds, economic policies differ across countries because every country is unique in terms of social, economic, and political stands (Anderson, 2013). For instance, South African economy is faced with high poverty, unemployment, and severe inequality issues as there are policy tools to correct these critical challenges in comparison the developed countries. As a developing country, South Africa is at the most Southern tip of the African continent with an approximate population of 58.6% million (StatsSA, 2019). Given the geographical context, the country is endowed with an abundance of natural resources namely diamonds, gold, coal and aluminum among others. These minerals have over the years drawn global investors to participate in the country's economy. According to Mabokela and Mawila (2004), the Apartheid State created diverse economic limitations as the country experienced series of economic hardships that curbed growth potentials.

However, since the 1994 dispensation, an enabling economic climate was established which made it possible for the country to start economic recovery for the periods ranging from 1994-2007 with the aim to improve health services, the inherited the social climate, reduce the rates of unemployment, and improve the general macro-economic conditions (Kyriacou et al, 2015). The National Economic Policy (NEP) of South Africa focuses on job creation to stimulate the growth of social equality (World Bank, 2015). All economic impediments of South Africa contribute to a weakening economic growth, slow investment potentials from global countries, low savings rates, and sub-standard economic performance (Ibem, Onyemaechi & Ayo-Vaughan, 2018).

The government of South Africa embarked on creating growth economy to create job opportunities and reduce poverty and inequality among the broader economy. In February 2006, a programme broadly referred to as The Accelerated and Shared Growth Initiative for South Africa (ASGISA) to coordinate the triple issues of job creation, decline in poverty and to curb unemployment (Dube & Zhou, 2013). The state of South African construction industry renders enough economic prosperities through infrastructure upgrade to create economic growth, productivity in the construction sector of the economy (Dlamini, 2012). As Ramachandra, Olabode and Rotimi (2009) explained, the industry add substantial values to the South African surge in activities as infrastructure is vital to trigger other economic development tasks

including building roads, bridges, harbours, and the railways infrastructure systems. Through the construction industry, semi and unskilled workforce are trained and assisted to access employment opportunities for over 1.4 million people (StatsSA, 2014).

The construction industry impacts the general economic growth and productivity across every economic system (Tang & Ogunlana, 2003). One of the catalysts of economic growth and development for any country is infrastructure projects that enable the availability of housing projects within and across major metros. Housing backlogs adversely impact the already struggling social and economic development projects thus increasing pressure on the education and health systems of the country (Murutlulle, 2021).

In developing countries including South Africa, affordability is one of the means through which a house can either be bought or rented as well as to determine the relationships that exists between the prices of house and personal income (Marutlulle, 2021). For households in developing countries, renting costs or house ownership is in a way giving away large sums of income (Bourne, 1981). Industries such as construction, engineering, manufacturing, technology, health, and mining are primary contributors to the general state of economic health. The construction industry enables communities to contribute to the growth of every economic development. A study by PWC (2017) confirms that industries such as engineering and construction during the first half of 2017 stimulates economic investments to the value of R34.2 billion. Furthermore, during the same financial period, it was estimated that construction output will surge by 85% amounting to \$15.5 trillion across the globe by 2030. In South Africa, the construction industry has been acknowledged to provide employment avenues and economic growth thus adding 3.9% to the country's gross domestic product (GDP) (PWC, 2017).

3.14 Historical foundation of the South African construction industry.

One of the latest democracies of the African continent and of the modern world across the developing countries is that of South Africa. Its establishment brought significant shift from gender issues and revised the apartheid racial challenges to an acceptable level (Balogun et al., 2016). Recent enforcement of the newly policy of Black Economic Empowerment (BEE) Act for the economy to provide the necessary socioeconomic freedom to previously disadvantaged South Africans (Barboza, 2012). Specialised and entrepreneurial skills were some of the practical skills that emerged because of the BEE policy framework. As such, the legislative

framework of the BEE was highly regarded in South Africa especially among the disadvantaged communities (Bashir et al., 2015).

According to Bowen Cattel, Hall, Edwards and Pearl (2012), BEE concept focused on issues such as property redistribution, wealth creation and providing economic opportunities across racial lines thus, refusal to comply with its legislations means maximum ten years imprisonment. The BEE policy was marred by acts of bribery, corrupt practices, and criticism by some racial groups to engage in practices of favoritism (Balcilar et al, 2017).

Again, in 2007 the BEE concept was replaced by B-BBEE policy as a corrective measure directed to support the vast majority and to remove the criticism of favoritism through specific legislative framework for over 15 years. Generally, Black establishments have surfaced in the construction industry with huge capital amounting to R600 billion in transactions backed by the BEE policy (Ibem & Laryea, 2018). Unfortunately, the BEE concept left all the experienced individuals to be out of employment due to segregation of some of the demographic economic groups (Zhu, Chew & Spangler, 2005).

3.15 Nature of construction activities and risks

Construction activities are temporary, distinctive due to the dynamic nature of every task and operation. Operations within the construction industry are dynamic and as such each task needs a high volume of financial support because of its complex establishment (Hernaus, Pejić & Bosilj). Past authors, Eybpoosh, Dikmen & Birgonul (2011) noted that projects of construction involve a high number of parties that participate in achieving project goals and its objectives during the entire processes of construction. Due to the serious complex and uniqueness of the construction industry, the industry experiences serious challenges. Some of these challenges include the geographical dispensation, the number of players, technical complexity as well as variability and large volume of inputs (Baloi & Price, 2012). Because the industry is characterized with different variables, projects are inclined to varying nature of risks. Table 3.5 below describes the unique characteristics of specific construction projects within the industry.

Table 3.5: Characteristics of Construction projects.

PROJECT CATEGORY	PROJECT UNIQUE CHARACTERISTICS
------------------	--------------------------------

Internal characteristics	Capital intensive; diversity of project stakeholders and end users; different work sites; utilize mobile tools and machinery; immovable work site and climate conditions
External climate	Site conditions; theft and war; unprotected and unproductive workforce; ongoing natural hazards i.e. storm, floods, and storms.
Aspects of management	Cost control; quality control measures; contractual tasks; time control – plan, investigate, design and project completion; quality control measures; environmental protection.

Source: Lui, Li & Zhang (2004).

3.16 Contributions of the construction industry in South Africa

Given the growing trends of the construction industry across the globe, the South African construction industry actively participates in increasing employment opportunities and GDP trends. The industry accounts for roughly 5.1% of the GDP figures in 2002, building contracts to the value of R45.4 billion approximately US\$ 7.5 billion (Lakshmanan, 2011). Regarding its contributions, the industry adds 35% of the Gross Domestic Fixed Investment (GDFI). According to Wilson (2013), the value of existing infrastructure requirement forecasts indicates significant GDFI participation that is valued to be twice the value of infrastructure in roughly five to ten years period.

According to recent study of the construction industry, about 60% of the industry represents SMMEs and SMEs across various sectors of South Africa (Ntuli & Allopi, 2013). These small businesses employed specific workforce with minimal skills in contrast to large entities, as such they have the capacity to create employment opportunities to the existing socioeconomic equity (Chimucheka, & Mandipaka, 2015). One of the key strengths of the South African construction industry constitutes its ability to provide adequate developments through projects (Windapo & Cattell, 2013). The industry provides physically built infrastructure the triggers economic growth as well impact positively projects operations (Lakshmanan, 2011). However, the construction industry is reported to have experienced severe drawbacks due to inadequate skill

levels as economic development dwindle due to the slowdown on utilizing the infrastructure budget that is valued at multi-trillion rand (Makhene & Thwala, 2009).

3.17 OUTLINE OF CHALLENGES IN THE CONSTRUCTION INDUSTRY

The construction industry is recognized as an essential sector for developing infrastructure, providing socio-economic support to the government. Some of the impediments that adversely impact the industry range from capacity and skills deficiency to poor project delivery to clients. Other forms of impediments are stated as follows:

3.17.1 Capacity and skills shortages

One of the biggest limitations and restrictive elements that impede successful contractors' operations entails the rising skills shortages and dwindling capacity of the workforce (CIDB, 2014; Ambe & Badenhorst-Weiss, 2012). Skills and capacity limitations hamper the delivery of quality projects that meet the deadlines of clients. According to Sitharam and Hoque (2016), the ongoing rising attrition rates within the emerging contractors can be linked to the generally low incompetency of management and financial illiteracy within the sector. Most emerging contractors continue to struggle for funding without the requisite collateral as prescribed by financial houses (Pillay & Mafini, 2017; Letchmiah, 2012). General lack of financial support makes it harder for contractors to access newer and efficient plants and equipment that use the latest technology (Pillay & Mafini, 2017).

As a result, the construction industry continues to be marred by lower rates of productivity. The general state of skills shortages within the construction industry cannot be left unnoticed. For instance, the overarching lack of managerial competency i.e., skills to understand financial ratios, to measure and compare the effectiveness and efficiency of operations, literacy of financial planning and to make sense of accounting data continue to weigh heavily on the industry thus contributing to high failures (Sitharam & Hoque, 2016). The construction industry suffers from skill shortages, inadequate and qualified workforce that is unprepared to render services under harsh operational and marketing conditions where the prevailing wages are minimally very low (Windapo & Cattell, 2013).

3.17.2 Access to work volume

The construction industry is classified as a sector for high level of employment opportunities. This is because the industry relies on project-based tasks and inconsistency in terms of employment opportunities and terms of employment as laid down by the various sectors of the industry (Kajimo-Shakantu, 2007). According to Markey and Patmore (2011), the industry lacks assurance of working conditions and employers' inability to offer employment opportunities on permanent basis. This is another cause for concern in the sector where there is high mobility of the workforce.

3.17.3 Access to finance

According to the National Credit Regulator (NCR) (2011) report, small construction firms require roughly 59% funding in contrast to 82% for larger enterprises. The lower state of finance within the small construction firms, unavailability of funding creates difficulties for most emerging contractors since many of them reside in geographical dispersion settings (Sitharam & Hoque, 2016). Given the general sub-standard living conditions of most of the emerging contractors, business funding and access to financial benefits is not easy; as such, they experience higher transaction and operational costs, exceptionally high-risk profile, late deliveries of projects (Sitharam & Hoque, 2016; citing Haron et al., 2013; Jeppesen, 2005).

Financial institutions even apply and even apply ratings procedures against small contractors. For example, based on the principal-agent theory (PAT) there has been a surge in the application of "*imperfect information*" regarding operations by small contractors in contrast to the large construction firms (Bolton, 2010). Recent report by the Construction Monitor (2016) revealed relatively insufficient access to funding constraints business growth potentials within different grades; grades 3 and 4 contractors hardly survive leaving grades 7 and 8 contractors are left to survive (CIDB Annual Report, 2017). Empirical Report by Letchmiah (2012) indicated that 63.5% of participants during a survey stated that the biggest impediments facing emerging contractors is the lack of funding opportunities that continue to halt the growth and expansion policies. Despite various State programmes to assist the role players in the construction industry, the sector is flawed by existing regulatory conditions that further impede growth possibilities (NCR, 2011). Issues of inability by the small contractors to generate funds create

negativities as the industry players practice the culture of non-compliance, inability to read and keep sound financial records (NCR, 2011).

3.17.4 Corruption, maladministration, and fraud.

According to Transparency International (TI) report (2005), the Construction Industry experiences large scale of corrupt practices in comparison to other industries. This, according to the report, was because the industry continues to face growing competition, unfair practices from other industry players and high unethical behaviours by contractors (Bowen et al., 2012). Besides, different actors within the procurement sector of the construction industry at National and Provincial levels spend roughly R21 billion on wasteful expenditure in contravention of the South African laws and regulations of 2010 (Ambe & Badenhorst-Weiss, 2012). Similarly, the South African Laws and regulations of 2009 report further add that an amount of R13 billion was spent as wasteful expenditure. A closer look at the two figures from 2009 and 2010, it became clear that within one year an estimated amount of R8 billion was overspent. There are situations where suppliers of products and services are known to be “*politically connected*” where large-scale overpayment for products and services are seen to dominate different sectors of the industry (Ambe & Badenhorst-Weiss, 2012). Other challenges that continue to plague the construction industry’s operations include the “*habits of kickbacks*” and “*suppliers on friendly terms with officials*” to access lucrative contracts without meeting set standards and norms. A situation that mostly led to poorer project deliveries to clients (Naude et al., 2013; Letchmiah, 2012).

3.17.5 Practices of “fronting”

“*Fronting*” as a concept manifest as one of the constraints that claims to legitimize false business transactions in return for government contracts (Mjoli-Mncube, 2005). According to Ntuli (2005), fronting is an impediment that adversely impacts the effective processes of implementing the Broad-Based Black Economic Empowerment (B-BBEE). The concept of “*fronting*” is an industry wide practices where White owned firms or White individuals employed a person from the Black ethnic groups that represents a fictitious shareholding right of a firm to win State contracts without satisfying the B-BBEE Act or codes of practice (Raga & Taylor, 2010).

The term “*fronting*” practices is described to mean specific action by industry owners mainly applied by the White population to gain maximum entity control through false representations (Kajimo & Shakantu, 2007). The entire construction industry is known for the practices of “*fronting*” due to the industry’s sub-standard transformation records (Letchmiah, 2012). Other practices of “*fronting*” includes the employment of wives by male contractors in positions of directors to meet certain industry requirements and laid down criteria for “*targeted enterprise status*” (Kajimo-Shakantu, 2007). There are two forms of fronting that are practiced in the construction industry. According to Raga and Taylor (2010), one form of “*fronting*” entails the employment of Black persons in directors’ positions without the necessary business skills or qualifications. The other form of “*fronting*” is the industry practices where the establishment of a front entity as a marketing firm or agent to replace the original entity to evade Preferential Procurement Policy.

3.18 THE CONSTRUCTION INDUSTRY DEVELOPMENT BOARD (CIDB)

The department of Public Works (PWD) is the sole custodian of the Construction Industry Development Board (CIDB) Act (Act No. 38 of 2000). According to Anthony (2013) and Letchmiah (2012), the PWD has the primary responsibility to support and promote the development of contractors within the construction industry in South Africa. Several measures were initiated by the CIDB to help emerging construction industry players through a structured regulatory framework practice a standardized business acumen and procedures within the Public Sector of the country.

The CIDB Act defines emerging enterprises in the construction industry as the enterprises that are owned, managed, and primarily controlled by individuals from disadvantaged settings that seem to be trying to overcome constraints (CIDB, 2008). Section 2 and 3 of the Act further add that CIDB depicts juristic individuals that have regulatory powers to function in the construction industry. Such a juristic entity must be registered with the Registrar of Contractors to embark on construction and procurement activities (Anthony, 2013). In terms of the Registrar of Contractors Act Section 16 (1), a National database is established with nine designated grades consisting of several contractors and classes of works that are mandatory for every contractual obligation that intends to operate on State projects.

The National database is arranged as follows: grade 9 contractors (mainly are of national and international scope). Grade 7 and 8 (operate within the region); grades 5 and 6 are contractors the operate locally and across specific regions. While grades 2 and 4 contractors who operates locally find it possible to engage in infrastructure development and upgrade with little skills and information to provide projects.

However, there is no credible statistical data that was published on grade one contractors with an estimate of 79% registered contractors. Registered grade one contractors in KwaZulu Natal and Gauteng were 50% (Construction Monitor, 2016; CIDB Annual Report, 2016). As enshrined in section 18 (1) and (2) of the CIDB Act, contractors who are not registered with the CIDB prior to taking any form of project commit an offence. Furthermore, the National Treasury adds that construction procurement needs to adhere to strict prescripts as outlined by the Construction Industry Development Board (CIDB) (Botton, 2014).

It is stipulated in the Act that within the Construction Industry, contractors are expected to fulfil the registration of projects or any construction work over R200,000 in the Public Sector project and R3 million as Private Sector projects. Table 3.6 below illustrates contractors according to prescripts of the Registrar of Contractors.

Table 3.6: Contractor grading designation of registered contracts

Tender value: range designation	Tender value (incl. VAT) not exceeding
Tender 1	R200000
Tender 2	R650000
Tender 3	R2 million
Tender 4	R4 million
Tender 5	R6.5 million
Tender 6	R13 million
Tender 7	R40 million
Tender 8	R130 million
Tender 9	No limitation

Source: Designed by researcher

The table above describes various single digits that represents contractors who are registered and their individual capabilities to engage in a contractual undertaking within a specified class of contractors' operational scope and limitations of specific range of tender value. As explained further by CIDB (2012), there is significant correlation in terms of contractors' profile and the country's demographics that gives disadvantaged population groups certain priorities in the construction industry. One of the core responsibilities of the Registrar of Contractors is the provision of effective targeting support to contractors in terms of size, distribution capability as well as the demographic of the population (Letchmiah, 2012). Despite the excellent reasons for its formation, the Registrar of Contractors are unable to conduct proper assessment of the competency levels of the contractors, the depth of quality work and the nature of skill of the workforce (CIDB Status Quo Report, 2009). A report by Windapo and Cattell (2013) stated that the Registrar of Contractors is unable to offer developmental skills to individual contractors through specific programme that is earmarked for developing them to attain higher level grades.

3.18.1 The Construction Charter.

The construction charter of South Africa represents the most intensive industry that grows at an estimated rate of 18.9% between 2011 and 2013 (National Treasury Budget Review, 2011). According to Report by the CIDB Construction Monitor (2017), the building sector of the construction industry add 8% of the overall aggregate employment figures as well as the informal employment opportunities. The construction sector of the Black Economic Empowerment is a policy tool that is designated to transform the construction industry country wide (PWC South Africa Construction Report 2016).

The enactment into law of the B-BBEE sector is crucial for the purpose of transformation to influence the processes of changing the economic landscape of South Africa. The body that monitors the implementation of the Construction Charter is referred to as the Charter Sector Council (CSC). Its main role is to implement policies and produce reports on the impact of charter in terms of the transformation processes (Construction Sector Charter Council Baseline Report, 2009-2013). According to the Baseline Report, the sector increased at various levels of social transformation. However, other areas that need urgent attention include issues of democratic strategies to promote and fulfil the promises to find solutions to poverty and to find solutions to poverty and societal inequalities (Johnstone, 2006).

3.18.2 Grading requirements of the construction industry

The processes of inspection, qualification and building categories are used to assess the skills and reliability of contractors. Using the grading system all the incompetent contractors are easily assessed and removed from the construction industry (Haupt & Harinarian, 2012). In South Africa, the grading of contractors is the primary responsibility of the body referred to as the Construction Industry Development Board (CIDB). The grading processes by the CIDB are based on the financial well-being of individual contractors. This implies that the contractors' capability to fund projects and engage in viable contractual projects is possible (Subramani, Sruthi & Kavitha, 2014). The grading criteria is carried out by the CIDB and ranks from grade 1 to 9 respectively.

The level of capability means the standard and work volume, contracts completed by the contractors and entered into the construction register including the number and members of project team as a legal requirement (CIDB, 2011; Zhu, Chew & Spangler, 2005). One of the basic requirements of contractors focuses on the better project classification to increase work performance by the contractors as expected to be registered that is undertaken within the construction industry (CIDB, 2011).

3.19 HISTORICAL PERSPECTIVES OF RISK MANAGEMENT OF CONSTRUCTION PROJECTS

As the level of project construction surges along with growing risks within the construction industry, Zhao et al (2010) posit that risk management should be the primary focus of the construction sector (Hwang et al, 2017). During the early 1990s, risk identification factors and utilizing techniques of risk assessment has been the focal point of scientists across the globe. In response, several contractors have designed a series of rules to assist in the management of risks. According to Mustafa and AL-Bahar (1991), a systematic technique is used to evaluate project risks and various forms of uncertainties during the stages of estimation to reduce the impact of risks. Different approaches to identification of such risk include identification of several sources of risks, risk assessment of projects impact and control measures (Birnie & Yates, 1991). Throughout history, two key sources, namely controllable and uncontrollable factors could easily trigger project costs and increase time overrun during project construction

(Akind, 1998). Mustafa and AL-Bahar (1991) further add that risk assessment utilizing different models of assessment to conduct project risks and analysis during the project binding cycle.

The nature of construction risks across the industry further creates strings of complications towards the completion of projects on schedule (Almeida & Oreta, 2020). Risk and uncertain future mostly trigger occurrences of events that represent 0% and below 100% with project impact objectives that results to serious consequences of unexpected and unplanned project initiatives (Chia, 2006). In general, the nature and state of construction risks and its sources can be properly managed and controlled in a complex environment such as the construction industry. According to Karimiazari et al (2011), construction risks and uncertainties relates to issues of operational environment, profit fluctuation processes, competitive binding, productivity across construction sites, political and inflationary climates in the country. To ensure high survival and sustainability within the construction industry, all the potential risks need sufficient management (Mahendra, Pitroda & Bhavsar, 2013). It is further revealed that risk management entails the processes of assessing, prioritizing risks through monitoring, control and using skills for resources to achieve objectives (De Marco & Thaheem, 2014).

In South Africa, the recent democratic dispensation of 1994 instituted different policies including the Black Economic Empowerment (BEE) policy framework that was aimed to redress previous economic differences (Department of Trade and Industry, 2014). Aside from the implementation of BEE, the Black Business Supplier Development Programme (BBSDP) was formed in 2000 to sustain and improve the competitiveness of black-owned businesses (Karimiazari, Mousavi, Mousavi & Hosseini, 2011). Despite these enabling policy measures, factors of impediments continue to draw back initiatives and policies. Thus, creating difficulties to attain set goals (Gupta, Sahib & Chahal, 2013). These drawbacks were the results of both external and internal conditions of establishments to monitor and manage policy measures that were instituted and put in place proper corrective paths (Choi, Mogyoro & Pehrsson, 2011).

The construction industry of South Africa was generally formed by large entities namely Murray and Roberts as well as Group Five in addition to other smaller role players referred to as the small and medium black-owned firms that were diversified to conduct civil infrastructure development tasks across the existing infrastructure and non-infrastructure landscape of South Africa (Du Toit, 2008). Since its formation, the construction industry of South Africa is faced with key drivers of historical challenges that continue to impede its growth possibilities. Some

of these historical challenges were the industry's inability to function well in a stiff marketing competition climate to achieve profit margins, shortages of skilled workforce, lack of understanding changes within the State regulatory authorities, poor quality of materials resulting into inferior and substandard products (Chaudhary, & Chaudhary, 2017; Andres, 2011; Craig, Magritte & Clark, 2014; Rudzani & Manda, 2016; Smallwood & Emuze, 2012).

3.19.1 Nature of project risk management in construction industry

By its nature, risk can be defined from many perspectives (Shunmugam & Rwelamil, 2015). For instance, in a complex climate where the construction industry operates, uncertainties are bound to happen thus causing unacceptable outcomes that need strict management procedures (Mishra, 2016). By nature, project risks are defined as any event that may take place through uncertain occurrences (Mullner, 2016). A study by Blaudziunas (2016) states that project risks are events that are indefinite rather are due to happen to affect set project objectives thus resulting in deviations. Mustaro and Rossi (2013) further agreed that project risk entails events that lead to significant threat or potential opportunity of enormous proportion.

In general, risk within the construction industry is linked to diverse decision-making processes; as such, it amounts to higher and riskier projects failures (Kuhn & Visser, 2014). Operation risks arise because of the uncertain operational climate in which projects are executed (Clark, 2016). As Altoryman (2014) revealed in a study, events that bear no certainties are characterized to lack measurement of information. In a complex and uncertain climate of construction, the occurrence of risk becomes rampant to be labelled as the primary destroyers of project objectives (Nieto-Morote & Ruz-Vila, 2011). Once the construction climate is littered with high uncertainties rates, all the projects become subjected to increase deviations from earlier objectives (Mullner, 2016). According to Mishra (2016), all projects in the construction industry need adequate management at efficient and effective levels that alerts management of the project status (Mishra, 2016; PWC, 2017). According to Taroun (2014) and Firmenich (2017), effective construction project management processes are very critical in managing risk within the industry.

3.20 GLOBAL PERSPECTIVE OF RISK MANAGEMENT IN THE CONSTRUCTION INDUSTRY

The primary focus of this section was to understand the insights of the construction industry and the lenses of the developed and developing countries. This section further provided detailed literature on risk management and its effectiveness within the construction industry of China and across the Asian Continent. The best strategies to curtail risk management also formed part of this section of the study. The challenges and obstacles of risk management and cost implications regarding poor management of risk were also featured.

One of the largest economies in the World and Eastern Asia is the Chinese economy. As one of the proponents of the second industrial revolution China is known for its aging population. Besides, the country has achieved enormous economic growth over the years. As such, the country is referred to as one of the global economic giants and in the Eastern part of Asia as the country practices strong strategic and economic policies to stimulate economic growth. The country occupies 9596960 km² of 97.2% land and 2.8% water. Despite high growth of the construction industry of China still faced foreign threats of competitors. Further threats to the industry include foreign contractors continue to enter the Chinese's construction industry with more capital, expertise and high technology and innovation.

Further obstacle the industry experienced include the surge in market entry by low-cost rural competitors from China who tried to dominate the lower market segment (Vekasi, 2019). Aside from these obstacles, the country's construction industry largely focused on building infrastructure for economic growth. Areas include building the road network, the designs of building and bridges. Through the construction industry, the yearly rate of China rose to 11.6% representing the highest global growth index between 1990-1996. In total the Chinese government invested roughly US\$188 billion in the sector that creates an annual growth of 8% as at 2000 (Taroun, Yang & Lowe (2011). The country can accumulate an overall output value rose from 0.218 to 2.8 trillion dollars.

According to Colin and Nadin (2012), the rising growth in output value was significant despite strict compliance measures and uptick in corrupt practices and stricter legal policies. Recent study by Zou et al, (2011) revealed that the present steady growth of the country's construction industry was likely to impact the overall economic growth. Colin and Nadin (2012) further

found that there was a positive increase between the country's construction industry and the national industry. Similar study by other scientist found significant yet negative impact of risk management in the industry on the asset of the country, group in GDP, the general economic development as well as other natural factors of the country (Colin & Nadin, 2012).

3.21 State of South African risk management in the construction industry

The construction industry of South Africa is not free from risks. Despite various initiatives that were instituted by the government to increase quality of projects management, the industry continues to be marred by project overruns and budget constraints (Shunmugam & Rwelamila, 2015). the Gautrain project was completed after two years of the agreed timeframe with a cost of more that R14 billion over the initial budget (The South African Politics, 2013). More risks emerged during the Transnet Durban to Johannesburg pipeline project at an initial budget of R2.5 billion. After almost 3 years the project was completed at R23.4 billion more over the budget (Guern Le, 2013). The general growing of inefficiency in risk management of projects in the construction industry depicts the risk of time and cost overruns, project that were unable to meet timelines, poor technical requirements, unsatisfactory projects, and compliance challenges in line with the Construction regulations of 2003. For legislative framework to be operational in the construction industry, a multi-stakeholder's intervention is required (Fortunato, Hallowell, Behm & Dewlaney, 2012).

Nonetheless, as pointed out by Taroun et al, (2011) in a recent study there was a minimal commitment to conform to primary requirements to promote risk management culture in the industry. Small contractors could hardly use the tools of risk management effectively as they viewed risk management techniques to be very expensive (Taroun et al., 2011). Improving risk management standards and the general levels of performance of small contractors could certainly be assisted through relentless monitoring and risk management review.

In South Africa risk management was not broadly applied in the engineering and construction climate; there is growing lack of adoption and to implement the practices and culture of risk management (Chihuri & Pretorius, 2011). As stated by Prince (2000) project success is dependent on risk management to be continuously implement in the industry. According to Rounds and Segner (2011), risk management compliance remains one of the critical processes that could help in completing projects successfully. Aside from all the benefits of risk

management still there are variables such as cost, time overruns the sub-standard work quality, and lack of satisfaction by clients remain the challenge in completing projects within the construction industry. The ongoing poor project performance in the industry calls for an urgent determination to institute practical risk management in the construction industry.

3.22 Construction risks

In general, the construction industry is plagued with numerous forms of risk challenges as modern communities expect project success and enhanced infrastructure development and upgrade (Bowen et al, 2012). As the industry takes more risks, it becomes critical that managing risks becomes a major priority and effective to enable clearer understanding of the nature and characteristics of risks faced by project managers. The nature of risk needs to be considered a critical element as it adversely impacts various project levels, namely the financial variables and execution time of projects (Rounds & Segner, 2011). Despite the complex nature of the construction industry, the depth of risk continues to grow and threatens the industry's survival thus impedes sustainability (Bowen et al, 2012).

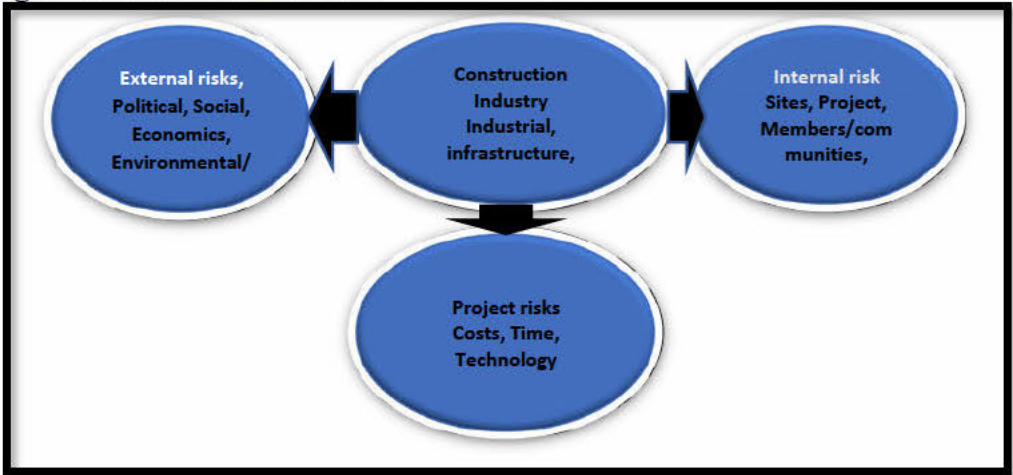
As the industry experiences a growing boom, there is the need for the industry to produce successful projects to be delivered as scheduled. According to Chihuri and Pretorius (2011), the performance of every project needs to apply some form of risk management techniques since most projects suffer from risks ranging from 70% to 90%. Without ongoing effective project risk management practices to alleviate existing risks and uncertainty within the construction industry, the industry will continue to experience delays in projects deliveries, contractual problems, and rising costs. To ensure that all these risk challenges are minimized, it becomes paramount that there are increased risk management techniques and to utilize an integrative approach during project operations (Banaitiene & Banaitis, 2012).

In South Africa only 16% of the construction industry implements risk management techniques during operations (Makombo, 2011). The study further adds that informal contractors are unable to plan towards the management of risks within informal construction industry due to lack of knowledge in terms of the risk factors (Hwang et al, 2014; Chileshe & Kikwasi, 2013). At the initial stages of project operations, only 38% of the industry players were able to institute some levels of risk management techniques. Similarly, within the construction there are

increasingly rising levels of perceptions that risk implementation is a time-wasting exercise (Makombo, 2011).

In another survey, Chihuri and Pretorius (2011) affirm that there were no blanket views regarding the lack of risk management implementation within the construction industry while other stakeholders in the construction industry apply risk management techniques. A recent study commissioned by PWC (2013), and Nordin et al. (2010) maintained that managing risk has been the primary component of an effective and efficient element in the construction industry. Accordingly, risk management techniques enable project managers to monitor existing nature and level of risks to ensure the successful projects are delivered to clients on schedule (Smith & Osborn, 2007). The bulk of construction risks that are in the construction industry are commonly referred to as unidentified utilities, falsify project designs, different sites conditions, and approximation of incorrect contact time (Project Risk Management Handbook, 2007). Figure 3.4 below illustrates the various types of construction risks that impact project operations and the informal contractors' activities.

Figure 3.4: Construction risks



Sources: Author's compilation.

3.23 CAUSES OF PROJECT DELAYS IN THE CONSTRUCTION INDUSTRY.

Having reviewed precious studies on identifying risks and assessment, several elements such as risk factors contribute to project delays and failures. Hence, the decision was reached to research the causes of project delays in the construction industry. According to Karim Jallow, Denim, Baldwin and Anumba (2014), there are seven causes of project delays. These causes of

delays as explained by the researchers were ranked in terms of frequency of events that occurred and their effect on projects. The researchers have shown the causes of cost overruns and delays of projects in the construction industry. Final outcomes by participants showed that primary causes include financial challenges during the design phase of project contributed to cost overruns as well as time delays. Results revealed issues such as funding, more allocation of time at early project design phase, choosing skillful consultants and reliable contractors in the industry is likely to reduce the growing time delay challenges and impediments of cost overruns.

Recent study conducted in the United States of America (USA) have identified seventeen causes of project delays. All the risks were ranked in terms of frequency of occurrence within the construction industry. Primary data for the study was designed to pinpoint the causes of project delays. Delay factors according to the study include approval for building permits, restating of building orders and documentations, changes to designs, specification changes, approval for shop drawings, development of project designs and changes to existing laws and regulations.

These past results were further confirmed in another study by Ofori (2013) that financial constraints and changes due to clients' orders that resulted to significant causes in project delays. Others include the existing weather conditions during project operations and the ongoing government changes in policy and regulatory framework. According to Frimpong et al (2003), project construction continues to face severe challenges due to rampant delays. These delays are the result of payment difficulties, poor contractual management as well as the processes used to procure materials and other equipment for operations.

In developing countries projects are delayed due to various factors that are common across the major countries. For instance, Ansah (2021) in a study revealed that almost all the forty-four contributing delay factors showed that over 99% were linked to projects. Another study by Alwi and Hampson (2003) using 31 causes of delay that were grouped in 6 categories and ranked as management factors were identified as the most significant delay causes that were experienced by contractors from large construction industries, However, the study further revealed that small contractors experienced project delays due to the factors of project design. These factors according to the study were ranked significantly high while project execution factors were the lowest among all the factors.

3.24 Impact of poor risk management within the Chinese construction industry

The construction industry continues to experience several risks. Key among the risks include flood, geological, earthquake and disasters in the agricultural sectors of the economy. The introduction of procurement methods further made the construction industry face more and severe challenges. As such, contractors in the industry are advised to reconsider and rethink a stricter risk management strategy to curb the growing risk volumes in the industry. In China, the construction industry practices different short-term approaches to attain high revenue and increased profit margins. Yet, the industry is faced with a growing lack of providing adequate skills training to the workforce. As a result, there has been a rising scarcity of skilled labour in the construction industries across the country.

Besides, the challenges of indifferent economic market, lack of accurate data and information impact the construction industry (Zou et al, 2017). According to Verbano and Venturini (2011), due to the nature of construction risks namely material costs, time overruns and sub-standard projects, it is appropriate to institute specific standardized and stable policy framework measures for a lasting risk management technique to aid stakeholders in the construction industry for an appropriate management. Recent scientific work by Yeung and Barry (2018), have shown that the Chinese's construction industry is influenced negatively through bureaucratic practices and lack of effective and efficient managerial skills have led to the industry's inability to produce quality products and improvement to project completion dates.

Different academics and scholars used varying approaches, namely the sources and ever-changing informal economy to provide theories that explain phenomenon (Wilson, 2011). Theories such as the dualist, structuralist (better referred to as neo-Marxist) and the legalist or neoliberal views are applied to explain the informal economy (Wilson, 2011).

3.25 Other impacting factors due to poor project management

Risk management during project operations is due to wrongful applications of project tools and techniques including the inability to apply good protocols of risk management throughout the operation processes (Adeleke, Bahaudin & Kamaruddeen, 2019). It is vital that project managers consider the chances of risks during every phase of project operations to avoid total project failures. The loss of human labour, interest, lack of management decisions, low

workforce levels and reduced focus on project methods were some of the contributors to low productivity in the construction industry (Öztaş & Ökmen, 2004). The poor management of project risks creates bad image for the industry and client's dissatisfaction that increases high financial risk and below expected profit margins in the industry. As Adeleke et al (2019) explained, any form of damage to the industry's reputation creates deeper clients' mistrust that takes longer periods to rebuild. Quality financial analysis, control and project risk management determine the profits and loss standing of any entity globally. Industry expenses that are linked to projects in the construction sector increase significantly as clients claim for poor and sub-standard projects (Perera, Rameezdeen, Chileshe & Hosseini, 2014).

Besides, the construction industry experiences scarcity of relevant production materials for operations. Inability to outline and plan for procurement, keep proper construction records for materials as well as rosters for transportation means acute shortages of suppliers of materials. Within a complex construction climate, where project managers assemble few project materials and unskilled and poor workforce, the entity is faced with enormous challenges of wasteful production materials that leads to expiry of production of materials, underutilization of other forms of resources prior to planned schedule for fresh clients' orders (BonÖglioli & Gancia, 2013).

Training the project workforce to use all the engineering tools, equipment and machines contribute to risk reduction in the industry. Due to increasing applications of unskilled workforce, the construction industry continues to suffer higher operational risks because of employees as operational equipment are damaged, overall project costs increases because of insufficient risk planning for projects (PM1, 2013).

Operations in the construction industry demand effective and efficient human resource planning in material usage, machines, and equipment application to reduce cost. Rounds and Segner (2011) asserts that the problems of under and over staffing as well as mistakes during recruitment processes are likely to lead to wrong recruitment and placement of employees to positions, they are not qualified to assume in the industry.

3.27 CONSTRUCTION INDUSTRY: CHALLENGES OF MANAGING RISKS

In general, managing risk in any setting is very crucial and demanding. A recent empirical study commissioned by Rounds and Segner (2011) stated that project risk management has become an ongoing process in the construction industry. Through the management of project risk, one can get insights of the efficient applications of resources such as financial, human, data and financial for maximum outcomes. According to Wang and Yuan (2011), have the expected knowledge of the specific impediments regarding risks, assist in making informed decision in the construction industry. The following are some of challenges that impact the management of risk within the construction industry.

3.26.1 Limited insurance policy.

Insurance companies render limited operational services to the construction industry. One of the key services includes the provision of critical advice regarding risk management during operations. According to Chen (2012), insurance entities lack the necessary experience and the knowledge to provide the industry with the requisite advice. Calculating insurance premium for construction firms is without challenges. Key among these challenges is the extended coverage of the construction risks. Consequently, this creates difficulties that require one's entity to be properly indemnified by insurance brokers. Thus, the insurance companies are unable to conduct the correct risk transfer processes to the relevant reinsurance market. As such, it results in the construction companies paying very low insurance premiums (Windapo & Martins, 2010).

According to Almeida and Oreta (2020), insurance companies lack the necessary techniques (the measuring tools) to measure construction risk for optimal insurance premium payable. The study further adds that challenges of low-risk investment, unpredictable construction processes, technology as well as safety drive the construction industry to engage in their own risk management practices (Almeida & Oreta, 2020).

3.26.2 Insufficient information prediction

The processes of operations within the construction industry are complex; as such models are applied to manage every project design, human, location, or time frame risks. Gathering

statistical data and facts to make the right decisions in controlling construction risks in the industry. These data include previous employees' experiences, historically backed data are critical to control eminent risk for the purposes of planning in future projects (Mustaro & Rossi, 2013). Construction data differs as other data differs with severe limitations. Thus, risk identification needs to be based on correct and definite new project information (Markey, & Patmore, 2011). According to Violante (2018), flaws due to human biases, data inconsistencies and costly forecast processes are some of the challenges that are faced in the construction industry.

Risk management in the industry focusses on conclusions and perceptions by experts in risks. It is therefore not easy for one person to acquire adequate risk knowledge about every project across the industry. Though expert perception may be dissimilar in terms of every project, the nature of project, experience, background as well as the individual personality (Windapo & Martins, 2010). Given these complexities, risk management processes should be based on accepted, open, safe, and trusted views from diverse project expertise with vast risk knowledge (Tummala & Schoenherr, 2011).

3.26.3 No efficient process of risk assessment.

Where there is growing lack of formal risk evaluation and management processes, risk identification, analysis and control measures poses severe project design threat of the construction industry. According to Nieto-Morote and Ruz-Vila (2011), comparing project risk directly assists in making better and informed project decision and better material allocation processes to reduce risks in the industry (Purohit, Siddiqui, Nandan, & Yadav, 2018).

3.26.4 Inability to be transparent and accountable.

Transparency entails operating a business base on top to bottom approach. The concept of transparency reflects ethical, cultural and the financial aspects of business operations. Lack of transparency is a critical pointer to business failure. Besides, is a concept that can have negative impact on business operations and scare potential investors away from the business dealings. Investors are unable to roughly estimate risk exposure in terms of bankruptcy once the entity lack transparency (BonÖglioli & Gancia, 2013). Inability by employees and the management of establishments to prove insurance cover for accountability risk to curtail high corrupt

practices need steady reporting to the authorities to uphold the image of the entity (Yan & Oum, 2014). The absence of accountability and risk management are early signs of negative organizational performance that further damage the image of the entity (Yan & Oum, 2014). As such, any form of sub-standard functioning of the accounting system triggers persistent corrupt activities in the organization.

3.26.5 Impact of poor project risk management on the construction industry

Proper and efficient management of risk is likely to influence project operation in the construction industry in a negative or positive path. Efficient project protocols in the construction industry serve to increase the value of capital in the organization for the provision of lasting competitive edge, profit margin growth and increase in shareholders equity. Adversely, poor risk management through the utilization of incorrect risk management techniques and control measures that lead to negative consequences in project operations in the construction industry (Idoro & Jolaiya, 2010).

3.26.6 Project costs overgrowth.

Construction projects that are not properly managed through enough risk management contribute to high operational project costs. Besides, lack of efficient project risk forecast prompts excessive unplanned expenditure such as increasing emergency and maintenance costs (Ratsiepe & Yazdanifard, 2011). From the views of labour force the contractors, the accuracy of excess costs during project operations are linked to growing clients' demands. Thus, risk knowledge, and more insights into project operations can assist in curtailing possible deviations from expenditure plans in the future. According to Asadi (2015), innovation projects ideas regarding materials usage and labour costs can easily increase to aggregated project costs. The management of project risk assists in mitigating risks expenses and edges the project team for credible funding and reliable budget. Unplanned project risks create an outcomes of budget overruns that results to limited budgetary measures at the start of construction activities (Choudhry & Iqbal, 2013).

3.26.7 Project delays and failures.

Poor risk control measures culminate in longer planning periods, unpredicted risk, operational schedules and completed projects are not delivered on time to clients. All the delays occurred when the schedule time past and the clients’ project was not completed. Furthermore, project hold-up by contractors arises when managing the expected risk takes much longer than expected. Hence, project plans about risk management must respond to project demands in an efficient, timely and quick way to lessen the risk of project delays for clients (Öztaş & Ökmen, 2004). Poor project risk management means failure of a project because risk means more payments for materials and other related resources. According to Halou et al., (2019), the gradual decrease in contractual project profits triggers high debt levels, project failures and closing of the contraction firms.

3.27 COST IMPLICATIONS FOR POOR RISK MANAGEMENT IN THE CONSTRUCTION INDUSTRY.

The cost of materials of any type is of utmost significant to project success and sustainability of the construction industry. Efficient cost planning and management reduces the potential risk and losses in the construction industry. Rosazuwad (2010) further explained that aggregate risk costs represent the uninsured losses, costs due to risk control measures as well as administrative and transfer costs. The table 3.7 below provides additional empirical work regarding various risks implications in the construction industry.

Table 3.7: Costs of poor risk management

Potential risk	Empirical definition of risks and implications	Source/Author
Opportunity cost	These are risks that are suffered by management when there are better opportunities after decisions have been made. These decisions include the time value of money, not able to use funds in an efficient and economically. Causes of inability to apply opportunities cost include loss of economic activities, losses due to time value, additional	Wittmer, 2014

	costs in transaction, sales figure decline, erosion of competitive edge.	
Direct & Indirect costs	These are projects and production costs because of labour, materials, equipment and labour	Chen et al., 2015
Transfer costs	The cost of bonds and treasury transfer, the costs include share number lost due to industry risks	Choudhry, 2019
Human risks	Result to poor risks management; bad control of strategies relating to risk; mismatch of human; roles that creates management issues, results to costs thus undermines the workers morales	Scott, 2018
Failure costs	Referring to the cost relating to materials reworking or costs due to projects rejected mostly known as internal costs of failure. It leads to significant dissatisfaction of customers or clients and contractors. Other external costs include replacement costs, rebuilding, warranties, and damages.	Billich, 2014
Appraisal costs	These costs include direct insurance costs, fines, deductible legal costs, inspection costs, recovery costs due to defective materials in terms of steels, pipes and building bricks costs that relates to the manufacturing of building materials.	Bayram & Ungam, 2018.
Prevention costs	Cost incurred to cover defects in construction plans; costs of components as a results of poor risk nature and to mitigate different defects during the earlier phase of projects.	Billich, 2014
Intervention costs	Also referred to as overhead, intervention specific costs or emergency costs. These are costs that are used to intervene the	Wittmer, 2014.

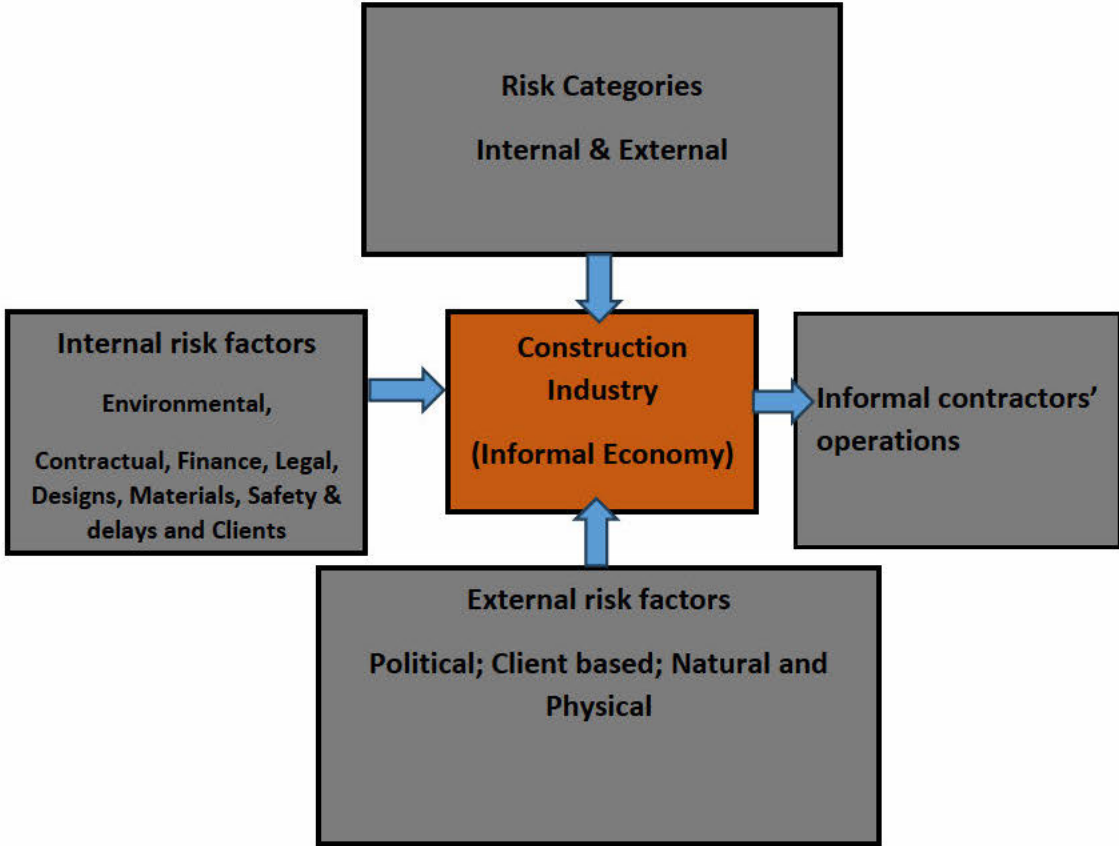
	consequences of poor risk management in the construction industry.	
--	--	--

Source: Adapted from Wittmer (2014) and Choudhry (2019)

3.28 CONCEPTUAL FRAMEWORK

Based on empirical review, a conceptual framework was designed to explain the relationship that exists between the internal and external risk factors on informal contractors' operations in the construction industry across the informal economy. Figure 3.5 on the following page presents the general relationship between the variables of internal and external risk factors. The internal factors being the legal, contractual, legal, finance, design, materials, safety and design as well as equipment while the external risk factors include the environmental, political, natural and client-based risks. All these risk factors impact the operations of informal contractors in the industry. The framework is based on the hypotheses that the internal and external risk factors in a way collectively impact the quality operations of informal contractors within the construction industry. The intensity of the impact could for instance, be through construction materials and legislative framework as well as operation design in the construction industry. Construction designs are often undertaken by competent designers with complementary experience, skills and capabilities, clients appoint a designer in search of solutions in terms of project and other related infrastructure problems. In sum, the assumption is that the impact of both the internal and external risk factors, the operations of informal contractors are unable to yield the desired outcomes of sustainability and success.

Figure 3.5: Conceptual Framework



Source: Design for the study

3.30 Conclusion

In this chapter the researcher outlined some of the relevant theories such as the fuzzy, organizational, the agency, institutional, the contingency as well as the theory of financing distress theories. All these theories were critically discussed to determine their relevance to the study. It is evident that the theories are identified as each provided enough description of phenomenon to be studied. The chapter further reviews literature on the risks and the risk factors, the causes, the effect and the influences of the several risk factors on the projects. In this chapter, the researcher outlines the different categories of risk sources into opportunity, uncertainty and hazard-based risks.

CHAPTER FOUR

RESEARCH METHODOLOGY

4.1 Introduction

Most often scientific studies emanate from the curious nature of mankind for insights into social as well as the natural settings. Scientists, academics, and numerous philosophers have found different ways and applications to study the complex nature of humans. According to Al-Busaidi (2008), these applications play major roles in directing humans' existence and how through research several scientists continue to understand the realities of nature through different forms of empirical studies. Based on the above, to ensure that empirical study adds value to existing body of knowledge for answers to socio-economic and natural challenges credible methods and applications are required. Simply put, scientific studies must be conducted based on accepted norms, standards, and regulations to reduce negative impacts on the final outcomes. The current chapter is designed to provide an overview of the procedures that are followed by the researcher with justifications for each method. As indicated earlier in chapter 1 of this study, the primary objective is to explore the risk factors influencing informal contractors in the construction industry in selected local municipalities. To ensure the primary objective is achieved to understand the depth of the problems, a mixed methods study was employed. Simply put, mixed method approaches in research entails using quantitative and qualitative means and procedures aimed to explore and describe the research phenomena (Delport & Fouche, 2011; Flick, 2011; Creswell, Plano & Clark, 2007). Throughout this study, mixed method approaches were used to enable the researcher to ascertain the appropriate information regarding participants' perceptions, views, experiences, attitudes, and individual feelings on the ensuing research topic for discussions.

The following *objectives* were identified through literature by the researcher to attain the primary goal of this empirical study.

- To establish the risk factors of informal contractors in the construction industry in the Free State Province.

- To examine the nature of risk factors in the construction industry in the Free State Province.
- To identify the significance of the sources of risk factors in the construction industry in the Free State Province.
- To evaluate the types of risk factors that impede operations of informal contractors in the Free State Province.
- To develop an integrated risk factors identification framework (IRFIF) to enhance operations in the construction industry.

The section below detailed the methodology that is used all through this study to achieve the stated objectives above.

4.2 Research approach.

Mackenzie and Knipe (2006) described paradigm as how the worldview is centered on different perspectives or thinking, share beliefs that provide specific and meaningful interpretations regarding the research data (Kivunja and Kuyini, 2017). Other scientists like Chilisa and Kawulich (2012) defined a paradigm as the means of describing the worldview based on the assumptions of philosophy about social realities. These entails three different research philosophies namely ontology, epistemology and axiology.

4.2.1 The concept of Ontology.

While some sociologists opine that “*reality*” is seen through the beholders’ eyes. Thus, one is obliged to comprehend the views of other realities (Blackstone, 2018). Others think that individuals are not likely to agree based on viewpoint because only one reality exists to be viewed (Blackstone, 2018). According to Kivunja and Kuyini (2017), the concept of ontology is based on individuals believe on logical thinking. Blackstone (2018) in another study found that ontology is the analytical view of one’s approach to engage in logical thinking or standpoint of reality.

4.2.2 Epistemology

The general significance of epistemology is based on knowledge that is necessary to be comprehended due to the benefit that is to be achieved (Al-Saadi, 2014). As Fekedi (2010) explains, epistemology entails the selection of research method that depends on issues that bear relationship on ontology questions (reality) and (knowledge). Epistemology is the primary

theory of knowledge that determines the researcher-participants relationship. For instance, the measure of quality research as well as the analytical representation and the subsequent write-up (Carter & Little, 2007). Epistemology is a technique that is used to assess basic knowledge as well as how the truth about something is to be attained (Kivunja & Kuyini, 2017). According to Blackstone (2018), the term epistemology is an assumption about finding out in detail the empirical research dataset. Its significance is assisting the researcher to have faith in gathering specific data (Kivunja & Kuyini, 2017). Loo and Lowe (2011) add that epistemology provides deeper descriptions of the relationship between specific researchers and the knowable.

4.2.3 Axiology

The term axiology stresses the need to define, assess and comprehend concepts that are correct or incorrect (Kivunja & Kuyini, 2017). According to Zaich and Larsen (2018), axiology are the research functions that are employed for in-depth enquiry based on the effect of values between concepts of paradigm, technique as well as the methodology. During the early days of research paradigms, the two well-known paradigms were positivism (quantitative research that tests hypotheses to attain set objectives and to predict future occurrences) and the interpretivism (concept associated with qualitative research based on individual perspectives to comprehend the worldview (Blackstone, 2018; Thompson, 2015).

According to Thompson (2015), interpretivists focus on qualitative approach of humanism in contrast to the positivists approach that is based on quantitative approach to scientific activities. Other paradigms have emerged to aid the tasks of social sciences. These paradigms include constructivism, interpretivism, feminism, positivism, post-positivism and the critical theory (Denzin & Lincoln, 2011). Researchers differ on the applications of these paradigms. Theoretically Creswell (2014) has given enough recognition to four of the paradigms namely the post-positivism, social constructivism, participatory or advocacy and pragmatism. In contrast, Kelly, Dowling and Miller (2018) were in favour of 5 key paradigms. These include positivism, post-positivism, interpretivism, pragmatism as well as constructivism.

Given the nature of this study, the researcher applied the post-positivism approach to guide the empirical paradigm. Early theorist Wildemuth (1993) defines post-positivism as a research approach that advocates for pluralism methodology. According to Panhwar, Ansari and Shah (2017), the view of pluralistic focus on balancing the approaches of interpretivist and positivist. The post-positivist approach is considered as an expansion to the paradigm of positivism as it reflects the thinking that challenges the traditional concept of truth based on the views of social

scientists (Creswell & Creswell, 2018). The application of post-positivism in this study assisted the researcher to objectively assess the phenomena through the quantitative and qualitative data (Panhwar, Ansari & Shah, 2017; Ryan, 2016). The post-positivism approach is used due to its flexible nature and appropriate to assess the various risk factors influencing informal contractors' operations by collecting large data. Besides, qualitative data can be applied to validate quantitative data to establish the foundation that is very solid to draw the conclusion (Creswell, 2013).

4.3 Research design

Research design is the third layer of the “*onion*” representation of the research procedure that consists of different layers (Saunders, Lewis & Thornhill, 2015). This empirical study employed a mixed method as a “*bounded system*” that involves the use of qualitative and quantitative approaches (Creswell, 2013). Mixed method research design as explained by De Vos et al (2011) stated that in making decisions to utilize mixed methods three vital decisions are to be made by the researcher. These include the timeframe or the mixed method sequence of gathering empirical data, the priority and significance of the design must be considered as well as the process of integration, the connectedness of datasets are critical (Creswell et al., 2003).

Adopting the mixed method approaches enable the researcher to triangulate, validate and address qualitative data for solutions to research questions that are based on individual responses and their perspectives (Hammarberg et al, 2016). While quantitative research strategy emphasizes the systematic assessment of the study by gathering field data and using different statistical evaluations namely mathematical tools and statistical calculations, the qualitative approaches apply meanings, concepts, definitions for the risk factors descriptions (Berg & Lune, 2012). Research design provides guidance for the researcher on data collection techniques as well as to focus on responses of participants (Babbie & Mouton, 2020; Nieuwenhuis, 2007). This study implements mixed methods namely qualitative and quantitative approaches that take place sequentially (Delpont & Fouche, 2011). Through qualitative, the researcher explored the phenomenon prior to measuring the empirical data using quantitative and statistical tools (Delpont & Fouche, 2011). three (3) focus group discussions (FGDs) were used to collect primary data from informal contractors in each of the selected LMs in the FSP.

Membership of the FGDs was constituted by the researcher. To ensure comprehensive discussions, a community hall was arranged and assigned for the FGDs where all the groups met over two weeks for discussions. In total three different groups participated in the discussions and each group was constituted by six informal contractors. All qualitative data collected during the focus group sessions assisted the researcher to develop quantitative data tools used to gather empirical data (Creswell & Plano Clark, 2011). Qualitative study followed empirical data based on quantitative procedures. These procedures involved exploration of the research topic for this study using large participants' samples from the study areas. These participants who provided data for this study were informal contractors who were approached by the researcher to provide data to be analysed. Throughout this study, it became clear that *“exploratory mixed methods sequential empirical research design”* was applied to gather both qualitative and quantitative data.

As stated by Creswell, Plano & Clark (2011), the design processes enable the researcher to explore the topic under discussion while qualitative themes and theories were generated. The diagram below illustrates the schema of qualitative and quantitative study applied in this study to gather data. The diagram further highlights two phrases of the design processes. The initial process explains the qualitative procedures that led to the second phase, the quantitative section. In both instances, the measuring tools were structured based on extant literature and the findings of qualitative outcomes. Figure 4.1 on the following page illustrates the mixed approach and the procedures based on extant literature to describe the design of the study.

Figure 4.1: Exploratory design of mixed method procedures



Source: Author's own construct.

4.4 Quantitative approach.

Quantitative research is referred to as an objective measurement and numerical tool that is used to support research questionnaires (Lacobussi & Churchill, 2010). The quantitative approach is

also referred to as a positivist research design based primarily on philosophical terms that is known as the logical positivism. It is a system that deals with the natural and scientific design during research process to provide scientific assessment without bias (Welman et al, 2005). By applying quantitative approach, the researcher can access precise and objective documents that are based on the scientific study for its outcomes to be generalized (Brown, 2017). The quantitative approach allows the researcher to use structured or close-ended questions that relate to a predetermined participants' responses that are quick and with inexpensive responses from many participants (Hair et al, 2017).

According to Wisdom and Creswell (2013), a quantitative approach allows the researcher to employ the method of a hypothetic-deductive during a survey to focus on the accuracy and replication of the phenomenon using documentation that enables the researcher to generalize the final research outcomes. However, the primary disadvantage of quantitative or the positivist approach is not able to find in-depth, holistic, and subjective impact based on human interferences (Bryman, 2016). Quantitative method is aimed to generalize the outcomes of the study based on the population from which the researcher draws the sample. As Creswell and Creswell (2017) explained, quantitative study facilitates the research process by conducting assessment of all the relevant theories by examining relationships that exists between the research variables.

4.5 Qualitative approach.

Qualitative approach comprises of five primary stages namely the case study approach, grounded theory, ethnography survey, and narrative approach (Creswell, Hanson, Clark Plano & Morales, 2007). Qualitative research method entails an empirical study of scientific nature that is used to collect systematic evidence from participants in words (Kumar, 2019). Qualitative approach is one of the research designs that provides opportunity for investigations that emerges through the responses of participants according to themes and sub-themes (Welman, Kruger & Mitchell, 2005).

According to Lazar et al (2010), in conducting qualitative research, the principles of critical peer checking, establishment of audit trail and providing "*thick descriptions*" out of participants responses to develop patterns. During qualitative study, the researcher clarifies, compare, weigh, and combine information and materials provided by the participants (Kukarni,

2011). The study found that qualitative responses by participants are coded by the researcher after the information is provided (Zikmund et al., 2013).

By its nature, qualitative data is centred on themes and patterns that are based on verbal, visual and in oral data collected by the researcher (Oates, 2006). In a qualitative study, numbers are seldomly used for inferences for meaning to be attached to the participants’ verbal responses (Zikmund et al., 2015). In this study, the researcher used both qualitative and quantitative methods that primarily focus on words not quantification. The main aim is to generate theories as well as ascertain the social settings of the research (Bryman, 2012). Table 4.1 below provides a summarised version of the differences between quantitative and qualitative approaches. The table below gives information on the various sections of the two research approaches.

Table 4.1: Summary of differences between qualitative and quantitative approaches.

Quantitative approach	Qualitative approach
<p><u>Philosophy</u></p> <ul style="list-style-type: none"> • Reality, single and objective Dual linkages between the author/researcher and participants. • Measurement of variables in isolation, described and measured. 	<p><u>Philosophy</u></p> <ul style="list-style-type: none"> • There is a general holistic existence between participants and researchers Socially designed, multiple realities. • Complicated variables, interlinked, difficult to measure in terms of numbers.
<p><u>Research purpose</u></p> <ul style="list-style-type: none"> • Generalised research outcomes, no context bound. • Descriptions of research outcomes, explanations with predictions. • Search for cause-and-effect relationships • Predict, explain, and describe data outcomes. 	<p><u>Research purpose.</u></p> <ul style="list-style-type: none"> • Research outcomes bounded in the social and historical context. • Focuses on understanding realities based on participants’ views. • Understanding reality from participants’ views. • Data are explained and data construction.
<p><u>Researcher’s role</u></p> <ul style="list-style-type: none"> • Not bias and detached from the study. • Participants’ perspectives not known. 	<p><u>Researcher’s role</u></p> <ul style="list-style-type: none"> • Personal involvement.

	<ul style="list-style-type: none"> • Try to understand the inner of participants' perspectives.
<p><u>Researchers' approach</u></p> <ul style="list-style-type: none"> • Deductive approach (strategies to test hypotheses). • Identification of statistical relationship, conduct hypotheses through analysts. • Random procedure used to select large population sample size. • Reliable on numerical values. • Applies scientific experiments, test statistical relationships. • Statistical reports using correlations, comparison of means and statistical outcomes. 	<p><u>Researchers' approach</u></p> <ul style="list-style-type: none"> • Inductive approach (generates new theories based on data outcomes). • Understand patterns, themes, and features. • Non-random processes used to select small population size. • Reliable on participants' words, responses, and phrases. • Non-intervention approach to access meaning. • Narrative report contextual description direct quotations based on participants' responses.

Source: Designed for the study

4.6 Motivation for using qualitative and quantitative research approaches.

Qualitative and quantitative research procedures are perceived to be incompatible as each have its distinctive processes of soliciting primary data and to conduct analysis (Eyisi, 2016). According to Creswell (2014) and Schulze (2003), qualitative and quantitative approaches enable the researcher to achieve holistic understanding of the research problem than adopting "single research". As stated earlier, assessing the influence of risk factors of informal contractors' operations required gathering primary data from a larger research participant and sought to achieve detailed information.

4.7 Justification for using qualitative and quantitative approaches.

Qualitative and quantitative approaches to any survey provides distinctive traits that continue to be discussed among academics and researchers. The strengths and weaknesses of qualitative and quantitative approaches cannot be left unnoticed as each of these research designs is

relevant to achieve the research aims. In general, this mixed method approach is justified because data can be combined to capitalise on strong points of each approach. Besides, combining the research data contributes to credible multiple-dimensional study that generates credible research outcomes (Punch, 2014).

4.8 Triangulation approach

This study applied triangulation process to gather data from different sources and techniques to ensure rigour, reliability and to validate data and quality (Rogers et al, 2011). The researcher further used triangulation approach to ensure that data is collaborated through various research instruments for richness and for holistic understanding of the risk factors in the construction industry (Stangor, 2011). The concept of triangulation is a research strategy that is used to improve, validate the study's outcomes, increase reliability of study outcomes and for evaluation purposes (Hussein, 2009). It is also used to assess the research problems through the application of two or multiple research tools (Stangor, 2011). The different types of triangulations are investigator, theoretical, data and methodological triangulation (Kukarni, 2013).

Triangulation a study outcome through data that entails the application of different data sources with the aim to validate results or utilising more participants to collect primary data. Similarly, the application of multiple research observers during the research processes is referred to as the investigator triangulation. For instance, applying any form of interviews, FGDs or using data analysts during similar research. Furthermore, triangulation through theories entail the application of multiple theories to aid or contest the study outcomes during the processes of conducting same empirical study since diverse theories were used to support the researcher to assess the research problems through several research approaches. Finally, triangulation by method refers to a research plan through which the researcher evaluates the research problem by adopting different scientific approaches.

This study applied theories and various methods as the means to triangulate the results for quality and for the purpose of validating and for rigour (Rule et al., 2011). Combining theories and methods, the researcher managed to achieve the best of each approach that overcomes the unique deficiencies of the triangulation strategy (Hussein, 2009). Using different research approaches as an investigative tool enables the researcher to better understand the research

subjects from different perspectives and to access the relevant information that serves to complement each other (Marty, 2008). To ensure maximum triangulation throughout this study, the researcher utilised FGDs to support the outcomes of the quantitative findings. Quantitative questionnaires were administered to informal contractors followed by responses from the FGDs that were analysed. Primary data from the questionnaires were also analysed by the SPSS statistical instrument to support the thematic outcomes. According to Hussein (2009), applying multiple research approach is likely to be inconsistency as well as utilising contradictory data sources. This strategy should not be viewed to be a clear weakness or disadvantage since inability of the researcher to be consistent or avoid contradictory findings rather help the researcher for more and deeper insights to the research problem under study (Marty, 2008). Through triangulation, the problem of this study was evaluated based on multiple views points not only for accuracy but to further strengthen the confidence of the study outcomes (Stangor, 2011)

4.9 Research population

Research participants form part of the target population that were involved in this empirical study. The target population consists of individuals and groups who were approached during the data collection period. According to Ledwaba (2012), a target population entails individuals and groups who are better positioned to provide answers to questions during the study allocated timeframe. According to Johnson and Christensen (2012) and Kumar (2019), target population is defined as the total group of research participants that showed interest and the willingness to participate in providing primary data. Quinlan (2011) on the other hand adds that in selecting the target population the researcher needs to take more responsibility in terms of availability of financial resources and practicability of research participants. McMillan and Schumacher (2010) define population as objects, individuals conform to specific criteria to which the researcher intends to generalize the research outcomes.

The target population of this research consists of all the 1267 informal contractors who works on infrastructure projects across the construction industry in four district municipalities (DMs) namely *Lejweleputswa, Fezile Dabi, Thabo Mofutsanyane and Xhariep* of the Free State Province. The four DMs consists of 18 local municipalities (LMs) namely *Nala, Masilonyana, Tswelopele, Tokologo, Mathabeng, Metsimaholo, Ngwathe, Moqhaka, Mafube, Setsotso, Mantsopa, Phumelela, Nketoane, Dihlabeng, Maluti-A-Phofung,*

Mohokare, Letsemeng and Kopanong from which the researcher sampled 304 informal contractors from a selected 18 LMs to provide quantitative research data. To ensure gathering maximum qualitative data, the researcher selected 18 informal contractors divided into three groups (group A, B and C) of six informal contractors in each group to participate in FGDs.

The quantitative and qualitative selection of informal contractors from the DMs were informed by the geographical settings and the locations of the participants across the FSP. All the informed contractors need formal training and development programmes, funding difficulties to secure equipment and materials. The participants were definite and known to the management of DMs. At least all the informal contractors acquired the least grade to qualify as contractors in the construction industry. Using the list from the DMs, a target population of 1267 informal contractors were identified from four DMs that were part of the study. Table 4.2 below depicts the total population consisting of the participating four DMs that were part of the study. The table also illustrates the sample size drawn from the population for this study. 18 LMs were selected from the total number of DMs of the FSP. The population for each of the four DMs were shown according to each of the 18 LMs. For informal contractors in the industry, the population consisted of grades 2 and 4 individuals with little skills in developing infrastructure projects. These contractors operate mainly in local areas in the FSP. The rationale for this selection was since at least these contractors understood the basic operations of the industry and demonstrated consistent best operational requirements.

Table 4.2: Table illustrating the target population and sample size.

District Municipalities (DMs)	Local Municipalities (LMs)	Total Population per LMs (informal contractors)	Sample size (e-0.05)
Lejweleputswa (430)	Matjhabeng	65 (Selected)	
	Masilonyane	15	
	Nala	10 (Selected)	
	Tswelopelo	26 (Selected)	101
	Tokologo	9	
Thabo Mafutsanyana (372)	Dihlabeng	45 (Selected)	
	Mantsopa	10	
	Maluti A Phofung	11 (Selected)	
	Setsotso	45 (Selected)	101
	Nketoana	5	
	Phumelela	5	
Fizile Dabi (194)	Ngwathe	41 (Selected)	
	Mafube	2	
	Moqhaka	61 (Selected)	102
	Me-tsimaholo	8	
Xhariep (271)	Kopanong	8	
	Letsemeng	4	

	Mohokare	5	
1267			304

Source: Design for the study.

4.10 Sampling strategy

The two known sampling strategies that are applied during research procedure are the probability and non-probability sampling (Castelberry & Nolen, 2018; Babbie, 2020). While the probability procedure involves the selection of samples randomly for every population member to get equal selection chance, the non-probability sampling procedure allows each population member the same opportunity to take part in the study (Ghauri, Gronhaug & Strange, 2020; Lehdonvirta, 2020; Sekaran & Bougie, 2019). According to Babbie (2020), the probability procedure enables the researchers to create scientific sample size that is the true representation of the entire population. It is therefore the primary technique that is applied to the larger population for social study (Castelberry & Nolen, 2018; Sekaran & Bougie, 2019).

Probability sample procedure comprises of five sampling approaches namely simple random, cluster, stage, systematic and stratified (Babbie, 2020). On the other hand, non-probability procedure is beneficial during research process as it provides not only quick, inexpensive information but also outlines information that is detailed about the population (Vehovar, Toepoel & Steinmetz, 2016). The non-probability entails five types of sampling. These include the convenience, voluntary, purposive, dimensional and snowball sampling tools (Gray, 2014; Creswell & Clack, 2017)

For this study, a purposive sampling strategy was applied to select the participants (informal contractors) from the selected LMs of the study areas. Adopting the purposive sampling strategy allows the researcher to choose the most active informal contractors based on set criteria that enable all the participants to provide rich information sources for this study to address all the research questions (Creswell, 2013; Bryman, 2012).

4.11 Sample size.

Sample is a representation of subgroup of the entire groups of individuals who participate in the investigation processes (Sekaran & Bougie, 2019; Lombaard, Van der Merwe, Kele & Mouton, 2018). Further definition by Kumar (2019) indicates that sampling is that selection

process which allows the researcher to select only a smaller number of objects from a larger group as a representative of the wider research group. The primary goal for the researcher to use sample size during the research process was to conduct a selection of some of the elements from the target population for a comprehensive conclusion based on the population. Based on the set criteria stated above (refer to the sample strategy), the researcher selected informal contractors through the application of purposive tool to participate in providing primary data for this study. Purposive sampling is one of the non-probability sampling techniques that apply the researcher's judgements based on the characteristics of a representative sample with a particular aim of investigation (Bless et al, 2013; Neuman, 2014).

For this quantitative and qualitative study, the researcher conducted a focus group discussion (FGDs) among informal contractors from the selected LMs. Out of the total sample size of 304 (refer to table 5.3), a list of 18 informal contractors were purposively selected to further participate in a qualitative FGDs. All the 18 selected participants met the set criteria outlined earlier and were divided into three groups of six informal contractors in each group. The three groups bear similar characteristics in that all the members were from the same geographical settings. Besides, only informal contractors who obtained grade four qualifications were selected to participate in the FGDs. To ensure easy interpretations based on group responses, the researcher named the groups A, B and C respectively. Membership of the FGDs were all informal contractors from the informal economy of the FSP. One of the benefits of applying a sampling technique was to make an in-depth inference from the research population from which the sample was selected. Quantitative sample selection was "hand-picked" based on the assumption the knowledge of the researcher about the population and its elements enhances better facilitation of the selection process (Broadshaw, Atkinson & Doody, 2017; Etikan, Musa & Alkassim, 2016). Thus, the research in this study was able to engage large population size to select informal contractors who were "hand-picked". From a total population of 1267, a sample size of 304 was purposively selected to participate in the quantitative study.

4.12 COLLECTING QUALITATIVE DATA FOR ANALYSIS

Data gathering forms the crucial part of any empirical study. It is equally significant as making decisions regarding the design as well as the strategy to adopt during specific study (Maxwell, 2005). Based on the objectives and the study questions, the researcher utilised the correct data collection plans and procedures to source empirical data. This section discusses the qualitative

data gathering approaches. Having selected the study sites from the four district municipalities, the researcher purposively chosen informal contractors of diverse expertise across the selected LMs from the study sites to participate in collecting qualitative data based on individual suitability to advance the research purpose (Rule et al, 2011). Only one qualitative data approach was applied namely the focus group discussions. The various techniques and approaches that were used in gathering primary data for qualitative analyses are discussed below.

4.12.1 Focus group discussion (FGDs)

This study employed mixed methods. To ensure maximum representation and in-depth findings, the researcher purposively used the FGDs to source qualitative data from the study participants. Only one FGD was conducted among informal contractors in four groups of four members in each group. Sarantakos (2013) defines FGDs as a discussion process constructed among members to achieve the primary purpose of this study. The FGDs is also referred to as “*group interviews*”. In most instances the FGDs involve four to six members (Berg, 2012). According to Canals (2017), FGDs is utilised during qualitative study as primary data gathering tool that is employed to source data from individuals with similar level of experiences and background.

The researcher employed FGDs in collecting data due to its ability to provide ideas and group opinions for further probing by members (Palmer et al, 2010; Rabiee, 2004). Membership of the FGDs need to be a representation of the target population (Kukarni, 2013). The FGDs is one of the qualitative gathering approaches that makes it possible for the researcher to extract participants’ vast experiences and understanding based on discussions of specific social sciences issues (Packer-Muti, 2010; Kite & Philayrath, 2017). Being a very interactive process, the FGDs is moderated by experienced individuals in a convenient climate aimed at sourcing specific scientific data throughout the study (McLafferty, 2004; Packer-Muti, 2010).

Members of FGDs were qualitatively selected from eight LMs out of four DMs across the FSP based on purposive and convenience sampling approaches (Strydom & Delpont, 2011; Babbie, 2010; Creswell & Plano Clark, 2007). Through qualitative sampling tools, membership of the FGDs consisted of 6 informal contractors in each group of three (group A, B and C) from a total of 18 participants who were approached to participate in the FGDs processes. To ensure

adequate and reliable data was obtained, the researcher applied “*maximum variation strategy*”; a strategy that is centred on selection process that conforms to similarities but varying individual training backgrounds across different locations with diverse levels of personal experiences (Babbie & Mouton, 2010; Creswell & Plano Clark, 2007). The FGDs was applied throughout this study to understand and determine the risk factors in the context of the construction industry. Participants mainly informal contractors during the FGDs detailed various action, processes as well as other social and human factors that leads to different risks in the construction industry.

4.13. Design of research interview

Focus groups or group interviews comprises of three to ten research participants. As Kukarni (2013) explained, the focus group members are the representatives of the target population. The FGDs is utilised to gather collective perception in an interactive discussion based on the research topic (Myers, 2009). Any quotation or researcher’s comments trigger a joint discussion on the topic by the researcher as well the participants from the different group members. Through the group members viewpoints, the researcher collected more insights of the study. Justifications for the researcher to utilise FGD in this study is to ensure maximum flexibility throughout the interaction with FGDs members and to gather large volume of scientific data (Hevner & Chatterjee, 2010).

Considering the problem of this study and the primary objective as indicated earlier, the researcher employed FGDs to gather primary data. Rowley (2012) defines interview as “face-to-face” interactions of verbal views where through discussions the researcher searched information for comprehensive understanding. Using qualitative approach means gathering data through the FGDs processes. The processes create the opportunities for researcher to source rich and insightful data based on participants’ perspectives (Denzin, & Lincoln, 2018). The FGDs further enables the researcher to ascertain rich data sources regarding participants’ opinions since the primary intensions of using the interview process as qualitative study was to gain the knowledge of individuals’ experiences and other truths (Aleandri & Russo, 2015; Shohel, Jia, Jahan & Roy, 2015).

4.13.1 Interview guide and construction of interview questions

During the preparation stages to conduct FGDs, the researcher sent out letter of information to the selected informal contractors. Once the informal contractors' responses were received, a meeting was scheduled by the researcher to introduce and explain the reasons, objectives, and the topic (Wahyuni, 2012). At the meeting, the researcher explained the necessary formalities to be undertaken during the interview processes. Besides, the topic of the empirical study was explained and discussed with informal contractors. The contractors were made to confirm their willingness to be part of the study. Thereafter the consent form was signed by informal contractors. The issues of confidentiality during the FGDs processes were also discussed at length. For purposes of individual protection during the entire processes, the concept of anonymity was explained and discussed with all the selected informal contractors.

For a smooth and systematic processes of administering the interview questions, the researcher used interview guide during the FGDs processes. Interview guide provides the researcher with the opportunity to consider possible drawbacks before the commencement of the focus group interview processes (Greeff, 2013). According to Sewell (2006), interview guide represents the outline of issues or topic that are to be covered during interview or the research processes. The questions that form part of the interview guide are mostly driven by theories. The researcher compiled the relevant questions to be included in the interview guide. The researcher based various aspects of the interview guide on themes from literature. Every theme consists of relevant questions on the nature and risk factors within the construction industry. The interview guide was divided into different sections with focus on specific themes that were gathered from the FGDs. Below are some of the inputs used to finalise the design of the interview guide.

Section A

The schedule questions in this section contains aspects of the interviewees' background of the construction industry. Also, the section featured questions on educational qualifications, industry sector, geographical setting, and the age profile of informal contractors.

Section B

Scheduled questions in this section seeks to understand the nature of the risk in the construction industry and the knowledge of risk by informal contractors. The primary aim was to identify whether informal contractors understand the various risk factors in the industry.

Section C

The schedule questions that form part of this section are structured to provide in-depth understanding the type of risk and to assess the general level of risk management skills by informal contractors.

Section D

The questions in this section are designed to determine the impact of risk factors, risk evaluation and to explore the risk factors. This section identifies the impact of specific risk factors in the construction industry.

In line with existing literature on designing the schedule questions Rowley (2012) add that interview schedule is critical during semi-structured interview should be properly designed and organised. Careful attention was paid to language usages and content for the interviewees to easily understood. The researcher conducted detailed evaluations to make sure that the questions were free from provocation of either “*yes*” or “*no*” responses, ambiguity and intrusive. Next the researcher was sure that all the questions in the interview schedule were derived from the literature. The following section provide in-depth descriptions of qualitative data collection through the FGDs.

4.14 GATHERING QUALITATIVE DATA

Open-ended questions were designed based on literature to facilitate smooth interaction with informal contractors during FGDs processes. The questions enable the researcher to focus on the risk factors that impact on the construction industry. Furthermore, the questions make it possible for them to try and understand the nature of the risk factors and to make accurate determination. The interview guide used throughout the FGDs include few guiding principles that allowed the researcher to make key observations regarding nonverbal cues in search for more clarity on specific content. Hence, it enables the researcher to alter the interview guide as the discussion progressed (Daniel & Daniel, 2005; Marshall & Rossman, 2016; Schwab & Syed, 2015).

Prior to the commencement of the interview processes, the researcher describes and explained the importance of the consent form and asked each informal contractor to sign. Also, the issue

of anonymity was explained. Informal contractors were reassured that no names would be revealed. In particular, the researcher informed informal contractors that participation in this study was voluntary.

In the end, the researcher interviewed a sample size of eight informal contractors. Two informal contractors per selected district municipalities. The researcher conducted FGDs were conducted in English as the generally preferred language by the informal contractors after consultations (Merriam & Tisdell, 2016; Patton, 2002). To ensure maximum attendance during the interview processes, one of the local community halls was rented for the purposes of convenience (Marshall & Rossman, 2016). Two sections of FGDs for the duration between 30 and 55 minutes was structured to share experiences among informal contractors. Tape recorders were employed during each session of the FGDs as it was significance to capture experiences of informal contractors. Based on the views of scientists Marshall and Rossman (2016), the researcher applied themes from participants' responses to facilitate FGDs.

Justifications for using the FGDs was that the researcher was conducting empirical study to understand a new phenomenon which was not extensively studied in the past. Employing the FGDs did not only provide the researcher to describe informal contractors' opinion but also explore individual thoughts on the topic (Flick, 2011). Applying FGDs to collect primary data was primarily a supplementary exercise to understand data source for semi-structured interview and qualitative approach (Greeff, 2013). Data gathering commenced by conducting two pilot focus studies consisting of ten informal contractors into two groups of five informal contractors in each group. The primary data collected through the pilot studies formed part of the final questions in the interview guide. In total, four FGDs each from the selected DMs of Fezile Dabi, Lejweleputswa, Thabo Mofutsanyana and Xhariep were conducted.

In total four different FGDs were conducted. Each focus group was provided with a profile form for demographic information. Open-ended questions as well as themes were used to seek information from informal contractors (Alasuutari et al, 2008; Creswell & Plano Clark, 2011; Jacob & Furgerson, 2012). Most of the questions posed to informal contractors during the FGDs were taken from the interview guide. The researcher allows maximum flexibility in posing and seeking answers from group members throughout the discussions. To avoid loss of data, the researcher used tape recorder to capture primary data during the discussions.

Besides, few notes were written on key themes from the literature by the researcher during the FGDs (Flick, 2011). Soon after the group discussions, primary data was transcribed for analysis (Sapsford & Jupp, 2006; Flick, 2011). Thereafter, the transcriptions were changed into verbatim, and backup prepared by the researcher to safeguard sufficient information through the personal effort of the researcher. Information received during the group interviews were designed to provide adequate guidance during the FGDs. Each of the FGDs lasted for a duration of 15 minutes during which the researcher probed every information provided by informal contractors in groups. For consistency, all the FGDs took place in a rented community hall arranged by the researcher in a non-threatening climate.

4.15 QUALITATIVE DATA ANALYSIS

Recent study by Labuschagne (2003) defines qualitative analysis of empirical data as the discovery of patterns or themes as shown in transcripts during FGDs or field notes. Methods such as conversation, interpretive, discourse, narrative as well as thematic analysis are linked to qualitative study. Qualitative study therefore calls for a research technique that is flexible (Braun & Clarke, 2006). According to Howitt and Cramer (2014), thematic analysis represents a study approach that identifies few themes that reflect the nature of textual dataset. Fereday and Muir-Cochrane (2006) in a similar study revealed that thematic analysis search for important themes that provides enough descriptions of the research issues to be studied. Agreeing with two key scientific arguments by Braun and Clarke (2006) and Fereday and Muir-Cochrane (2006) and Howitt and Cramer (2014) the researcher realised to employ thematic analysis as the most suitable approach to be used in this study in lieu of the present objective.

In this study, the researcher conducted qualitative thematic analysis (QTA) based on empirical data that were obtained from FGDs (Miles et al., 2014). The QTA focuses primarily on approaches such as identification, analysing as well as reporting of themes based on empirical data. Conducting QTA on the onset entails the coding process for meaningful patterns to be derived from the raw data. QTA is suitable for this study since it allows the researcher to understand the risk factors that impact the construction industry. Also, through the QTA approach, the researcher could determine and identify the risk factors within the construction industry due to the flexible nature of the thematic approach (Ibrahim, 2012). QTA to analysing empirical data in this study involved the following phases that were outlined (Braun & Clarke, 2006). The following sections describe and explain the various phases of the QTA.

Phase 1

The researcher conduct familiarisation with the empirical data. Thereafter a thorough literature reading and active listening to electronic recordings to find meanings and patterns based on primary data.

Phase 2

This section focuses on verbal transcriptions of data. The researcher wrote down every electronic data recording that emerged from FGDs to be written down. This allows the researcher to become more familiar with the field data for the extraction of meanings and patterns (Ibrahim, 2012). Again, this phase provides the researcher the necessary opportunities to transcribe data into verbatim.

Phase 3

The researcher conducts data coding processes. This phase is applied by the researcher to identify different elements of maximum relevant interests and meaningful to the study (Braun & Clarke, 2006). Coding is very critical because it organises the empirical data into appropriate groups and themes. The process involves figures, tables, and mind maps to attain maximum themes and sub-themes.

During a qualitative study different approaches are applied to ensure quality study by applying the concept of trustworthiness (Marshall & Rossman, 2016), triangulation methods are applied to achieve credibility through multiple sources (Denzin & Lincoln, 2011). Trustworthiness of qualitative data refers to the level of consistency used to undertake same category of a scientific research in a different locations or occasions using different observers (Newton, 2009). To ensure trustworthiness, this study used FGDs to gather data in addition to member checks to enable the researcher to reflect on data collected from the participants. Qualitative researchers are mindful to ensure that the dearth of trustworthiness of the study is paramount data gathering processes (Korstjens & Moser, 2018). For trustworthiness, the researcher was transparent during the FGDs and take recordings during discussions all the verbatim were transcribed.

4.15.1 Trustworthiness of qualitative data

Data trustworthiness in any form of empirical study is a major concern (Denscombe, 2010; Yin, 2009). Assessment of data trustworthiness is very important during qualitative and quantitative

approaches (Patton, 2002). The general focus of a social research phenomenon and subsequent interpretations of qualitatively obtained field data based on FGDs is vital for providing enough understanding. Trustworthiness entails dependability, stable, reliable, consistency, transferability and highly consistent of qualitative data (Delpont & Roestenburg, 2011). In trying to enhance the trustworthiness of the present data, the researcher undertakes to verify the data by utilising the approaches such as the technique of peer review, reflexivity, and member assessment (Babbie & Mouton, 2010; Delpont & Roestenburg, 2011). The concept of trustworthiness is linked to credibility of the research outcomes. Other related terms include transferability and applicability of the research outcomes. Credibility represents another form of qualitative criteria that is used to evaluate the true value of qualitative study (Hammarberg, Kirkman & Lacey. 2016).

As Kumar (2019) explains, empirical study is effective by assessing its level of credibility once the scientific tools are consistent, accurate and be predictable. Scientific studies that are rated credible provided their findings demonstrate adequate descriptions of the research context. The present study demonstrates through qualitative approaches relating to triangulation, reflexivity and verbatim based on empirical data provided (Schwartz-Shea & Yanow, 2012). During this study, the researcher engaged for hours with informal contractors to demonstrate the credibility and to further confirm the collection of field data (Hammond & Wellington, 2013). The researcher's action shows the intensity and rigor in terms of how data analysis was conducted.

Generally qualitative studies are faced with that challenges that findings that emerged from empirical studies cannot be easily reproduced as in the case of quantitative findings (Denscombe, 2010). Further limitations include the involvement of the researcher during the data collection periods namely the FGDs processes. Again, it is known that qualitative studies are conducted in various environment at any given period. Given all these challenges, it is paramount that the research outcomes be trustworthy. Hence, qualitative research is based on the principle of transferability.

Qualitative findings in most instances are based on small sample. Based on small sample size, the researcher also finds it very difficult to apply the findings in other research climates (Denscombe, 2010). However, in a case where the researcher applies multiple case study, there is the opportunity to easily transfer the study the study outcomes to other similar study groups to include the nature of specific climate where respondents reside as well as their personal

experiences. Throughout this study, the selected district municipalities display similar geographical and social settings. As such, there is a stronger rate of transferability regarding the outcomes that emerged from the study.

4.16 ETHICAL CONSIDERATIONS

Ethical issues during research processes are set of standards, principles and values that applied to access the correct conduct that is appropriate during each phase of research activities (Adler & Clark, 2011). This allows the researcher to employ mixed approaches to find solutions to the problems under investigations. It is paramount to consider ethical issues that are likely to impact on both approaches. According to Saunders et al (2016), the concept of ethics in research entails *“the standards of the researcher’s behaviour in relation to the rights of those who are the subjects of the research project, or who are affected by it”*. Considering ethical issues in scientific study is about the researcher’s ability to seek participant’s permission prior to gathering data (Busher, 2002). It is therefore about research procedures that are seen as norms and others that are undesirable (Sabottka, 2016). Throughout this study, the researcher guided against the physical and emotional harm of informal contractors, guarantee their anonymity, privacy, fairness, and impartiality as the study progressed (Mero-Jaffe, 2011). The researcher paid special attention to ethical issues to ensure that all ethical requirements of the Faculty of Management Sciences were met. Application for ethical clearance was submitted with all the required documents including the data gathering instruments namely the questionnaire and interview schedule. Other ethical concerns that the researcher found could cause physical and psychological harm to participants were considered (Stangor, 2011). The researcher mitigated this by approaching the participants for informed concern to enable participants to feel free to participate in the study.

Ethical issues in scientific studies are very crucial especially in private and among marginalised and highly vulnerable settings (Marshall & Rossman, 2016). This qualitative approach is faced with numerous setbacks as the researcher conducts research activities in rural areas for data (Dickson-Swift, James, Kippen & Liamputtong, 2007). The researcher commenced this study by seeking permission from informal contractors prior to collecting empirical data. All principles regarding ethics were adhered to. For instance, the researcher explained the potential benefits of the study to informal contractors and maintain high level of dignity to informal contractors. Other ethical issues including voluntary participation was explained to all the

informal contractors. Besides, the researcher provided informal contractors with notification regarding the objectives of this study through letter of information. Several visits were paid to the selected district municipalities to discuss and explain the impact of the results on communities. The researcher informed informal contractors that empirical data provided would not be made known to the public. Informal contractors were protected from harmful physical climate during data collection processes since the interview processes took place in a rented community hall in a protected location.

4.17 PILOT STUDY

According to Bless et al (2013), a pilot study is defined as conducting scientific study with a small number of samples to determine the research method, instruments as well as the appropriate type of data analysis to be used prior to engaging the larger research sample. Piloting the study earlier curbs unclear questions, grammatical mistakes and provide useful answers that are used to restructure the final questions. In this study, the researcher used only one group of informal contractors (group A, B, C) to assess the interview schedule. The feedback was later incorporated into the final interview tool. The final research instruments namely the questionnaire and the interview schedule were moderated by experts. The experts' feedback was later used to compile the final quantitative and qualitative instruments that were administered to informal contractors. These actions by the researcher were not only necessary but appropriate to ensure the final analysis of the study is representative (Salkind, 2015).

4.18 QUANTITATIVE MEASURING INSTRUMENT

The questionnaire is one of the primary data collection techniques that is utilised to gather primary data from target population (Sakaran & Bougie, 2010; MacMillan & Schumacher, 2006). The questionnaire that is designed for this study utilised open and close-ended questions based on Likert-scales (Cameron & Price, 2009). Open-ended questions are described as helpful instruments that provides enough confirmation of specific scales (Malhotra, 2010). Sections of the questions indicated in the questionnaire were designed in the form of open-ended to ask informal contractors questions regarding the challenges posed by risk factors within the construction industry. Similarly, the researcher used open-ended questions to pose questions to informal contractors with the view to determine the nature and types of risk factors that on regular basis affect operations in the construction industry.

The close-ended questions indicated on the questionnaires expected informal contractors to choose answers from list made available by the researchers (Babbie, 2011). The close-ended questions used in this study were aimed to enable informal contractors to provide enough ratings to determine which risk factors highly impact the construction industry. Also, close-ended question makes it easier for informal contractors to determine the most challenging risk factors in the construction industry.

4.18.1 Quantitative instrumentation

Drawing on recommendations of Delpont and Roetenburg (2011) and Thomas et al (2011), the researcher made the decision to apply a close and open-ended questionnaire to seek answers from informal contractors. The questionnaire used during this study followed logical and sequential presentations that are designed to include various sections of each question starting from general to specific questions (Wimmer & Dominick, 2012). Section A and B were designed to use open-ended questions to try and access more information from informal contractors.

Section A of the questionnaire focused on demographic information such as age, marriage status, gender, race, and educational achievements. **Section B** comprised of six open-ended questions based on the general information about work experiences and risk management knowledge of informal contractors. The researcher designed **Section C** of the questionnaire that comprised of eight close-ended questions anchored on a five Likert-scale scales ranging from (1) 0-20% “*no effect*” to (5) 80-100% “*extensive*” to identify the impact of risk factors on operations the construction industry. All the questions in this section discussed management factors. **Section D** of the questionnaire discussed specific factors of a project design. Seven close-ended questions ranging from (1) 0-20% “*no effect*” to (5) 80-100% “*extensive*” were designed to identify the risk factors of a project design in the construction industry. **Section E** of the questionnaire consisted of four close-ended questions based on a five Likert-scales ranging from (1) 0-20% “*no effect*” to (5) 80-100% “*extensive*” structured to identify the risk factors to determine the impact on the operations of informal contractors within the construction industry. **Section F** of the questionnaire consisted of seven close-ended questions based on a five Likert-scales ranging from (1) 0-20% “*no effect*” to (5) 80-100% “*extensive*” designed to identify the risk factors of materials that impact on project qualities.

The primary purpose of this section was to assist the researcher to understand the depth of challenges faced by informal contractors in the construction industry. Section G of the questionnaire consisted of four close-ended questions based on a five Likert-scales ranging from (1) 0-20% “no effect” to (5) 80-100% “extensive” was designed to identify the risk factors relating to project equipment that are used by informal contractors in the construction industry. The primary purpose of this section was to identify the effect of risk factors relating to project equipment by contractors during the construction activities. Section H of the questionnaire consisted of six close-ended questions based on a five Likert-scales ranging from (1) 0-20% “no effect” to (5) 80-100% “extensive” was designed to identify the risk factors of labour that impact on the construction industry. Section I of the questionnaire consisted of seven close-ended questions based on a five Likert-scales ranging from (1) 0-20% “no effect” to (5) 80-100% “extensive” was designed to identify the risk factors of the external that impact project qualities in the construction industry. Table 4.3 below depicts the pictorial design of the questionnaire scales that provides guidance to collect primary information from informal contractors.

Table 4.3: Descriptions of a 5-point Likert-scale questionnaire

0-20%	25-45%	50-60%	65-75%	80-100%
No effect	Minimum	Moderate	Significant	Extensive

Source: Author’s own construct.

4.18.2 Administration of quantitative instrument

The study sites were four selected district municipalities in the FSP. In line with the protocols of scientific study, the researcher attached a covering letter, letter of information and a consent form to the questionnaires. All the questionnaires were personally administered to informal contractors in all the selected district municipalities to ensure clarifications of various items in the questionnaires. The researcher provided adequate directions to informal contractors by using Likert-scales signifiers such as (1) 0-20% “no effect” to (5) 80-100% “extensive” (Munro, 2014). As mentioned earlier in this study, the research sample was purposively selected consisting of informal contractors who provided primary data through the FGDs. The researcher encouraged proper coordination by using the services of two trained field workers. Prior to their engagement, to assist the informal contractors, the field workers were provided with two weeks

extensive training programmes on all the research protocols with the aim of curbing temptations of committing acts of bias during the data collection processes (Zikmund & Babin, 2015).

The field workers were accorded special opportunity to wait for all the informal contractors to duly complete the questionnaires in their presence in every district municipality. Furthermore, the field workers were asked to collect the signed documents issued to the informal contractors. Few of the documents that were not completed were later sent to the secretaries of the selected district municipalities to be dispatched to the researcher after a week. The informal contractors were strongly advised not to discuss the questions among each other to avoid the desire to commit acts of bias as the findings were outlined.

Roughly three weeks were set aside for administering, completion and collection of the questionnaires. However, the researcher experienced some challenges due to the return and the rates of responses by informal contractors. These challenges were due to local municipal elections since the bulk of informal contractors were involved in campaign activities for their political parties. At all times, the researcher assured the informal contractors of the principles of confidentiality and anonymity; that information made available would not be disclosed to the public or individuals (Mitchell & Jolley, 2007; Alasuutari, Bickman & Brannen, 2008). Strict confidentiality and non-disclosure of personal information was guaranteed by the researcher. Contact details of the researcher and the supervisor was made available to informal contractors aimed to facilitate easy reach of the researcher for further assistance and clarification of questions. Prior to disseminating the questionnaires, the researcher discussed at length ethical issues with informal contractors across the selected district municipalities.

4.19 Analysis of quantitative data

Existing literature describes data analysis as the “*process of transformation raw data into operational information*” (Organisation for Economic Cooperation and Development (OECD, 2013). Other scientists including Vithal and Jansen (2010) indicated that analysing data means making sense of accumulated raw information from participants. Raw datasets are based on questions from research questionnaires that are designed as text. As such, it is paramount to establish response categories and to conduct extensive analysis for scientific results (Kukarni, 2013). Conducting data analysis rests more on the researcher’s strategy towards data interpretations. At present, there are advanced descriptive tools such as data reading instruments

to determine patterns as well as multifaceted tools employed during the stages of data analysis (Miles, Huberman & Saldana, 2014).

This study employed mixed methods namely qualitative and quantitative techniques. Roger et al (2011) defined qualitative data analysis as research tool that presents themes, stories and patterns based on responses of participants while the primary focus of quantitative tool depicts numerical, mathematical, and statistical processes. Data gathered through quantitative instrument such as questionnaire are shown in graphs, tables, and figures (Fouche & Bratley, 2011). The general process of analysing quantitative data began as the researcher captured raw data electronically to keep the raw data together, in an organised manner for better accessibility (Neuman, 2014).

In analysing this empirical data, the researcher was cautious during the data capturing procedures aided by statistical methods to draw the meaning out of the raw data (De Vos, 2005; Neuman, 2014). To achieve optimum accuracy on the onset, the researcher embarked on data cleansing process. This the researcher accomplished through data verification of possible disparity in the original data and the data captured electronically (Babbie & Mouton, 2010; Singh, 2007). Mistakes that occurred as the process ensued were suitably identified and given maximum attention by the statistician for the final provision of report to be utilised through various stages of analysis (Sapsford & Jupp, 2006).

Analysing the primary data, the researcher undertook the following approaches:

- Raw data from the field was transformed into useful analytical format, assign values to data scoring that are numerical based on responses from informal contractors.
- Cleaning primary data
- Provision of data analysis in the form of statements, tables, figures, and graphs

4.19.1 Quantitative data interpretation

The section provides an overall “*essence of the research*” (Leedy & Ormrod, 2015). As explained by De Vos (2002), the process of interpretation involves the researcher to make sense of the research data collected from the participants. Quantitative data interpretation entails the

application of all the tools and techniques that were employed by the researcher to create sense out of the raw data through numbers. This study applied graphs, pie charts and tables to explain descriptive data. For inferential, the researcher utilised statistical tools such as ANOVA to test null and alternate formulated hypotheses.

4.19.2 Test of analysis of Variance (ANOVA)

The analysis of variance (ANOVA) test evaluates the relationships between variables of two or more. However, applying the ANOVA test increases type 1 error as the ANOVA makes it possible use the statistical tool of means of different groups at the same time guiding against the type 1 error of 0.05 alpha levels (Munro, 1997). In this study, the ANOVA assessment was conducted to establish relationships between the dependent (impact of risk factors) and independent variables (likelihood of risk factors).

4.20. Reliability and validity of quantitative data

Several approaches exist to establish enough the reliability of any research instrument that measures exactly to achieve the purpose. These scientific and statistical tools including testing, retesting as well as the technique of split half (Delpont & Roestenburg, 2011; Gratton & Jones, 2010). Reliability entails reproducing the research outputs as well as the credibility of the study (Anderson, 2013). Reliability is explained as an assessment tool that provides similar meaning to any data at any time for same findings (Brynard et al, 2014).

Cronbach alpha is a statistical instrument that is applied to assess the internal consistency and group item's reliability (Andrew, Damon, Paul & McEvoy, 2011). Throughout this study the researcher applied the Cronbach alpha and conducted pilot test as the measurement approach to attain the questionnaire reliability (Sekaran & Bongie, 2016). The scientists further add that in using Cronbach alpha, reliability can be achieved as the alpha is closer to 1 to achieve internal consistency as well as reliability of the research instrument. To ensure higher levels of credibility throughout the study the researcher used the following:

- Conditions of the study were continuously standardised.
- The general difficulties of the research instruments were moderated.

- There were constant checks to reduce the impact of external events.
- Questionnaire items that were not clear were rectified.
- The researcher was consistent during the scoring processes.

4.21 CONCLUSION

This qualitative and quantitative study was empirically designed to unearth knowledge. It is designed with specific goals and research questions. The mixed method approach conducted by the present study was structured with detailed presentations on the methodology chapter above. The chapter was designed to provide detailed clarity on how answers to the research questions were ascertained. Besides, the chapter gave rich descriptions of the processes that were undertaken in selecting the design, population, sampling technique as well as the methods and specific tools of statistics. Data gathering approach which formed part of the chapter was also discussed at length. Lastly, the statistical approaches to be applied throughout the data analysis in analysing the field data were described and explained with justifications. The following two chapters present with deeper discussions and findings of the empirical study.

CHAPTER FIVE

RESULTS AND INTERPRETATIONS

5.1 Introduction

This chapter provides an account of the overall results based on the data analysis, as well as the outcomes from the primary dataset that was collected through the questionnaires and FGDs within the construction industry across the LMs of the FSP. The initial phase of this chapter outlines the quantitative analysis through the application of SPSS (V27) in the form of descriptive and inferential analysis using graphs, pie charts, numbers, percentages, and the frequency distribution. Besides, the chapter utilizes sufficient sample size for a robust analysis and for the interpretation of the quantitative data gathered from the field. The NVivo (V12) software. The final phase of the analysis includes the qualitative section aided by the thematic tools in the form of themes and sub-themes through FGDs. The process entails data transcription from the FGDs, which were divided into various meaningful qualitative codes. These codes were later developed by the researcher based on the differences, similarities, and specific meanings, which were the results of the transcribed qualitative data –a process that allowed the researcher to fine-tune the final data into suitable themes and subthemes.

This chapter focuses on analytical presentations based on FGDs with 18 informal contractors divided into three groups of six members in each group. In terms of the qualitative analysis, the FGDs were analysed according to the group settings with specific numbers to establish maximum anonymity. During the FGDs phase, all the information collected was transcribed verbatim and the participants' quotations were applied to support the themes and subthemes discussions. For confidentiality, the researcher made a conscious commitment to keep the informal contractors' identities as well as to safeguard the individuals' anonymity.

5.2 Research Aim and Objectives

The study aims to explore the influence of risk factors on informal contractors' operations in the construction industry in selected municipalities of the Free State Province. The objectives of this empirical study, as outlined in Chapter 1, are as follows:

- To establish the risk factors of informal contractors in the construction industry in the Free State Province.
- To explore the nature of risk factors in the construction industry in the Free State Province.

- To identify the relative significance of the sources of risk factors in the construction industry in the Free State Province.
- To evaluate the types of risk factors that impede the operations of informal contractors in the Free State Province.
- To establish an integrated risk factors identification framework (IRFIF) to enhance operations in the construction industry.

The researcher distributed an informed consent form as well as the research questionnaires to the selected informal contractors who signed them and thereafter completed the questionnaires. The informed consent forms were also signed by all the interviewees; thereafter the researcher administered a copy of the interview questions to each of them. These forms were signed prior to the commencement of the FGDs and the interview processes. To ensure maximum anonymity, the researcher stored the questionnaires and the completed interview forms separately from the signed informed consent forms. A total of 304 informal contractors completed the questionnaires between February and June 2023, while 18 informal contractors took part in FGDs soon after June 2023. The researcher tabulated all the questionnaires as numbers on a spreadsheet, as the outcomes of the FGDs and the questionnaires were analysed according to the different sections (Section A to Section P) of the questionnaire. Some informal contractors were unable to answer the questions as expected. The questions were designed with multiple options that the informal contractors could choose between. The quotations of the informal contractors were referenced by utilizing the naming convention of group A, B and C members to protect their identities.

5.3 RESEARCH INSTRUMENTS.

Quantitative and qualitative research instruments were used in this study; the questionnaire was designed in various sections (Sections A-P). The questionnaires were administered to 304 informal contractors who reside and engage in active projects' construction activities across eight LMs in the FSP. Regarding the qualitative instrument, the interview schedule was later administered to 18 informal contractors selected from the total sample size of 304 who were divided into three groups (A,B and C) consisting of six members in each group to participant in the FGDs.

5.3.1 The rate of response

The researcher anticipated recruiting a total number of 424 informal contractors at the beginning of the research process, based on the study sample size, who were calculated to participate in the quantitative study. This empirical study was conducted in the periods of February 2023 and June 2023, during which time the quantitative questionnaires, which were administered to 304 informal contractors (N=304), were fully completed. Thus, the response rate of 71.6% was deemed sufficient to provide a credible data analysis to ensure that adequate and reliable statistical data was run to meet the research objectives (Fincham, 2008).

5.3.2 Reliability of the research instruments

To ensure the reliability of the research instruments, the validity of the applicable instruments is critically important. One of the most common scientific tools that is utilized is the Cronbach alpha. The Cronbach alpha is primarily used to assess research instruments that are fit for specific purposes (Plummer & Ozcelik, 2015). The level of reliability and internal consistency of the research instruments are measured by the Cronbach alpha, based on stable and higher consistency (Kumar, 2019). The Cronbach alpha needs to remain stable and show reliability as the instrument is used in similar studies. Validity means the individual values of an instrument that enables the researcher to draw a comprehensive conclusion based on a specific population sample (Creswell & Creswell, 2017). Through identification and methods of assessments, reliability can be understood to allow the twin concepts of reliability and validity.

The researcher conducted a pilot assessment among informal contractors and other risk management experts that was consistent with recent study by (Farquhar, 2017). Table 5.1 on the following page shows different statements relating to reliability and validity that were utilized during the construction of the instrument.

Table 5.1: Results of the reliability analysis

Section	Factors	Number of items	Cronbach alpha
C	Management factors:	8	0.518 fair
E	Project Design	7	0.528 fair
G	Finance	4	0.768 good
I	Factors relating to materials	7	0.697 good
K	Project equipment	4	0.647 fair
M	Labour in the construction industry	6	0.904 excellent

O	External environment	7	0.822	very good
---	----------------------	---	-------	-----------

From the tabulated data of table 6.1 above, the Cronbach alpha scores for each item that is linked to management factors, product design, finance, factors relating to materials, project equipment, labour in the construction industry and external equipment all revealed fair values of internal consistency ranging from 0.518 to the value of 0.645. The Cronbach alpha value of 0.645 was recorded on project equipment. This shows a good level (64.5%) of internal consistency of the item in the questionnaire. Moreover, the Cronbach alpha value of 0.904 was recorded based on the item in Section M “labour in the construction industry”, as stated in the questionnaire. The average scientific tool of the Cronbach alpha score was 0.912 as a statement on the questionnaire. This means an acceptable score level (91.2%) of internal consistency on every item stated in the questionnaire.

5.4 EMPIRICAL FINDINGS

The following section reflects the findings based on descriptive statistical analysis that were conducted on collected raw data from the research areas through the questionnaire. The raw data was collected from 8 LMs namely Matjibeng, Nala, Tswelepele, Dihlabeng, Maluti-A-Phofung, Setsotso, Ngwath and Moqhaka. Descriptive and frequency statistical tools were applied to explain and provide a summarized version of the quantitative data in a comprehensive format (Marshall & Jonker, 2010; Heeks & Wall, 2018). The mean and standard deviation were applied in the form of charts, graphs, and tables to explain the analysed data. Inferential tools were utilized to ascertain the relationships between variables and to make judgements based on observed data (Gupta, 2012). This was followed by frequency distributions supported by different participants’ responses.

5.4.1 The approaches used for descriptive and thematic data set.

The current study gathered qualitative and quantitative data which was analysed the application of descriptive and thematic methods. Data analysis has vital bearing on the rate of response; thus, it is significant to explain the procedures utilized during data analysis processes. According to Bernard and Bernard (2014), data analysis assists researchers to explain the reasons behind each pattern that emerged. Both qualitative and quantitative data was presented through questionnaire and interview schedule. Through the Statistical Package for the Social Sciences (SPSS) version V13.0 and Microsoft Excel quantitative data was gathered, coded, and

classified followed by presentations using graphs and tables of percentage distribution to ease the reading and interpretations (Bain, 2017). Data was further compared, summarise through tabulation and to highlight short explanations.

The primary aim of descriptive analysis is to provide in-depth descriptions of the basic features the study data set that emerged throughout the processes of analysis. As Bain (2017) explains data analysis provides limitations regarding generalization of specific group outcomes that formed part of the study. Various aspects of the data were analysed through descriptive statistics. Thus, providing the researcher with data information using simple descriptions of what the data illustrates (Barnard & Barnard, 2014).

5.4.2 Descriptive Statistics

This study utilized descriptive statistics to provide a summary of the demographic characteristics as explained by Saunders et al. (2016) and Trochim (2006). The demographic characteristic of this study is discussed in two sections. Sections A and B include questions to be completed by the informal contractors regarding the ownership of the firm, gender, level of education, age, marital status, business registration and level of experience. As with the pie charts and the graphs, the researcher applied frequency distributions to display additional information.

5.4.2.1 Business ownership

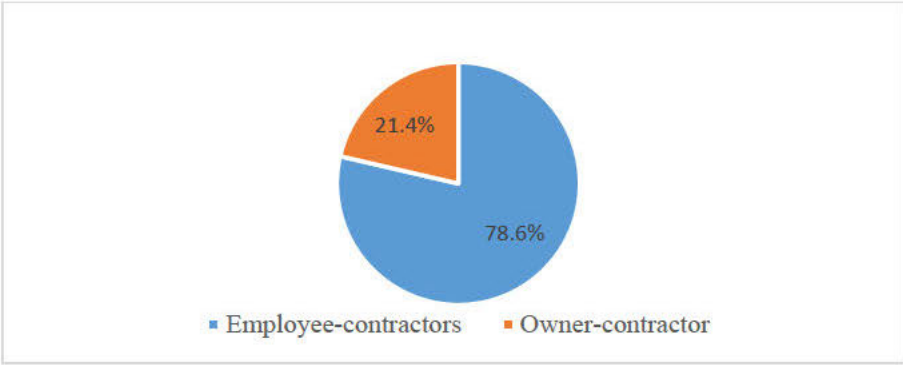
- **Purpose of the question**

The question indicated in Section A, No. 1 (Appendix A) of the questionnaire was to determine whether the informal contractors own the construction firms from where they operate. The questionnaire provided two predefined categories, which allowed the informal contractors to select the best option.

Results attained based on the analysis.

Figure 5.1 below illustrates the construction firm ownership by the informal contractors across the selected LMs in the FSP.

Figure 5.1: Ownership of construction firm



Analysis of results

A total of 78.6% of the informal contractors are owner-contractors, while 21.4% represented employee-contractors in the construction industry in LMs. The result indicates that more than half of informal contractors are experienced and can control risks during project operations. It is therefore safe to state that only a small number of informal contractors lack the necessary experience to own construction firms across the study areas.

5.4.2.2 Gender composition of informal contractors

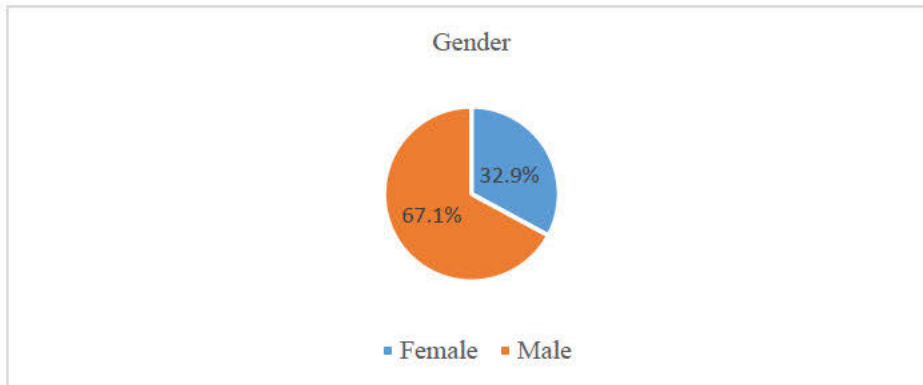
- **Purpose of the question**

The question indicated in Section A, No. 2 (Appendix A) of the questionnaire was to determine the gender composition of the informal contractors in the construction industry. In sum, the question was designed to determine the number of males and females who work in the construction industry as informal contractors.

Results attained based on the analysis.

Figure 5.2 below indicates the gender composition of informal contractors in the construction industry across the selected LMs in the FSP.

Figure 5.2 Gender composition of informal contractors



Analysis of results

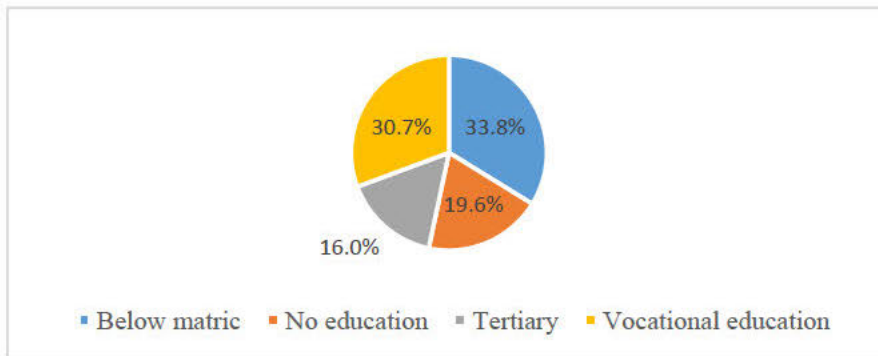
The analysis indicates that 67.1% are male informal constructors compared to 32.9% female informal constructors. The outcomes of the analysis thus indicates that there are more males in the construction industry. Based on the findings, it can be deduced that the construction industry in the selected LMs is male dominated.

5.4.2.3 Level of education of informal contractors

- **Purpose of the question**

The question indicated in Section A, No. 3 (Appendix A) of the questionnaire was to determine the formal level of education of the informal contractors in the construction industry across the selected LMs. In total, four predetermined levels of education were provided for identification. The result in Figure 5.3 below is based on the various academic qualifications of the informal contractors.

Figure 5.3: Level of education of informal contractors



Analysis of results

As indicated in Figure 5.3 above, 33.8% of the informal contractors had below a matric qualification, while 30.7% obtained a vocational education. Other levels of education achieved by the informal contractors were 19.6% who had a tertiary education and 16% who had no form of education within the construction industry in the selected LMs of the FSP. Based on this result, it is clear that the bulk of the informal contractors had formal education; thus, informal contractors should be able to identify the risk factors and curb risks in the industry.

5.4.2.4 Age composition of informal contractors

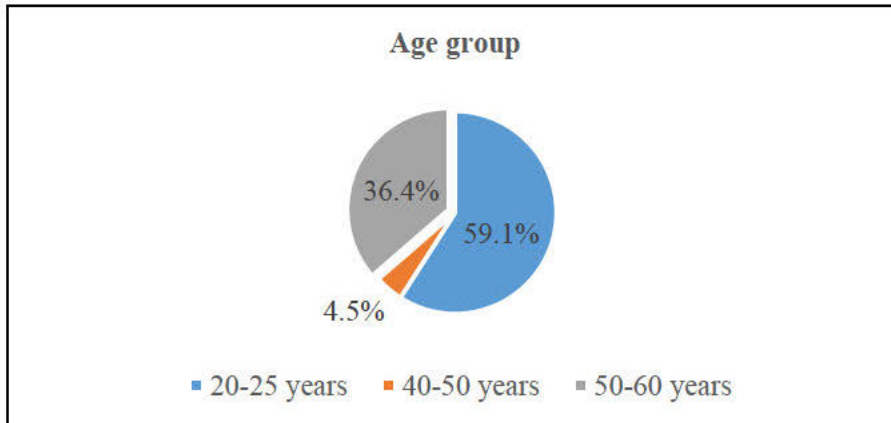
- **Purpose of the question**

The question indicated in Section A, No. 4 (Appendix A) of the questionnaire was to determine the age distribution of informal contractors within the construction industry across the selected LMs in the FSP. The researcher identified three predefined age groups to facilitate easy identification by the participants.

Results attained based on the analysis.

Figure 5.4 on the next page illustrates the age composition of informal contractors in the construction industry across the selected LMs in the FSP.

Figure 5.4: Age distribution of informal contractors



- **Analysis of results**

As shown in figure 5.4 above, the majority (59.1%) of the informal contractors are in the age group between 20 and 25 years. This is followed by 36.4% in the age group from 50 to 60 years, while only 4.5% of informal contractors were aged between 40 and 50 years. This analysis revealed a youthful industry across the LMs in the FSP who could craft strategies in the future to curb and identify risk factors in the construction industry. At the same time, the result also showed that the industry is composed of more mature and experienced informal contractors.

5.4.2.5 Marital status of informal contractors.

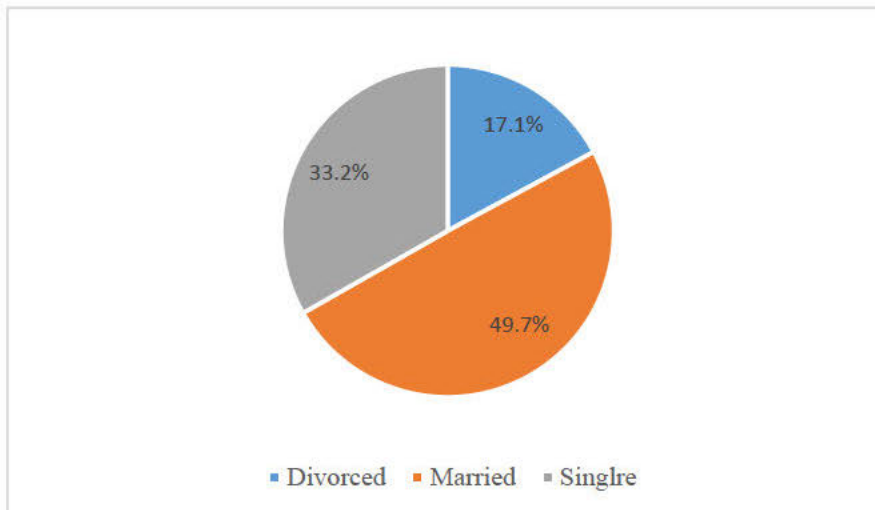
- **Purpose of the question**

The question indicated in Section A, No. 5 (Appendix A) of the questionnaire was to determine the marital status of the informal contractors within the selected LMs of the construction industry in the FSP. The researcher categorised three predefined groups to facilitate easy identification.

Results attained based on the analysis.

Figure 5.5 below represents the marital status of the informal contractors in the construction industry across the selected LMs in the FSP.

Figure 5.5: Marital status of informal contractors



- **Analysis of results**

As shown in figure 5.5 above, 49.7% of the informal contractors are married, while 17.1% are divorced. The remaining category of informal contractors, 33.2%, are single.

5.4.2.6 Business registration of informal contractors

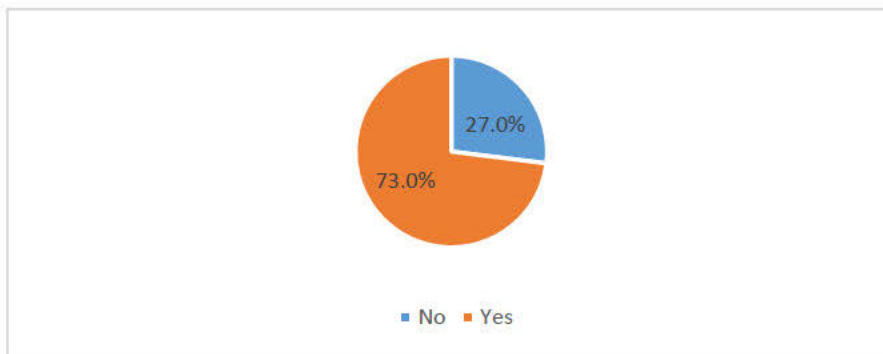
- **Purpose of the question**

The question indicated in Section B, No. 1 (Appendix A) of the questionnaire was to determine information regarding the registration of the construction businesses across the selected LMs of the industry in the FSP.

Results attained based on the analysis.

Figure 5.6 below represents the state of business registration by informal contractors in the construction industry across the selected LMs in the FSP.

Figure 5.6: Business registration by informal contractors



- **Analysis of results**

As shown in figure 5.6 above, the majority, namely 73%, of the informal contractors have registered their construction businesses, while 27% are not registered.

5.4.2.7 Years of experience as informal contractors

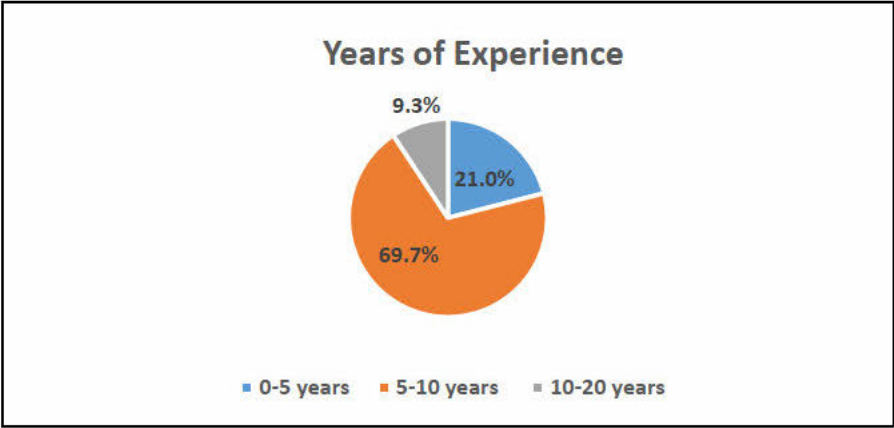
- **Purpose of the question**

The question indicated in Section B, No. 3 (Appendix A) of the questionnaire was to determine the years of experience of informal contractors in the construction industry within the selected LMs in the FSP. The researcher categorized six predefined groups of years to facilitate easy identification from 0 to 20 years.

Results attained based on the analysis.

Figure 6.7 on the following page represents the years of experience by the informal contractors within the construction industry across the selected LMs in the FSP.

Figure 5.7: Years of experience as informal contractors



- **Analysis of results**

As shown in figure 5.7 above, the majority, namely 69.7%, of the informal contractors have a high level of experience ranging from 5 to 10 years within the construction industry. This is followed by 21% of informal contractors who have five years' experience and 9.3% who have experience ranging from 10 to 20 years. The results shows that only a small number of informal contractors have more than 10 years' working experience in the construction industry. The assumption is that employees with fewer years have attained less experience at work. In contrast, informal contractors who have lengthy service periods have more work experience (Connelly & Kelloway, 2003).

5.4.2.8 Frequency distributions of responses

Table 5.2 to 5.15 were aimed to capture in-depth implications of infomal contractors' perspectives regarding the impact of risk factors on the construction industry. Through the frequency distributions, the analysis illustrated how primary data distributions were conducted using different categories among the informal contractors. Based on Table 5.2 to table 5.15 of the informal contractors responded to every statement. To ensure adequate reponses the study utilised a scientific tool, the 5-point Likert scale (1-5), which ranges from *no effect to extensive*. Included in the questionnaire were other sections on a similar scale ranging from *not likely to most likely*. The informal contractors' responses to different statements, as indicated in Section C to P (Appendix A) of the questionnaires below, were discussed below each table. The discussion on the informal contractors' perceptions and the impact of risk factors are depicted in tables 5.2 to 5.15 below in frequencies and percentages respectively.

- **Purpose of the statements**

The purpose of the statements in Section C (Appendix A) of the questionnaire *was to identify the risk factors* that impact on the activities of the construction industry. The frequency distributions of the informal contractors' responses to the statements, as stated in table 6.2 below were categorised on a 5-point Likert scale (1 to 5) as follows: *no effect, minimum, moderate, significant, and extensive*.

5.4.2.9 Identification of risk factors that impact on operations of informal contractors.

Table 5.2: Frequency distributions responses of informal contractors

Risk factors	No effect		Minimum		Moderate		Significant		Extensive		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
C1. Decision making procedures	0	0,0	50	16,4	100	32,9	74	24,3	80	26,3	304	100
C2. Communication with shareholders	0	0,0	66	21,7	95	31,3	55	18,1	88	28,9	304	100
C3. The presence of representatives	0	0,0	63	20,7	95	31,3	62	20,4	84	27,6	304	100
C4. Sharing information	0	0,0	62	20,4	91	29,9	54	17,8	97	31,9	304	100
C5. Contracting experiences	0	0,0	58	19,1	93	30,6	59	19,4	94	30,9	304	100
C6. Competency as a contractor	0	0,0	52	17,1	101	33,2	68	22,4	83	27,3	304	100
C7. Conflict resolution platforms	0	0,0	60	19,7	96	31,6	68	22,4	80	26,3	304	100
C8. Quality control measures	0	0,0	63	20,7	92	30,3	57	18,8	92	30,3	304	100

- **Analysis of results**

Based on the statement “*Decision making procedures*”, as shown in Section C (C1), 32.9%, 24.3% and 26.3% respectively indicated a moderate, significant, and extensive impact. Only 16.4% responded to the statement as minimum. Table 6.2 shows that the highest proportion of informal contractors indicated that there is a moderate (32.9%) impact of decision-making procedures on the activities of contractors in the construction industry. Moreover, 21.7% of the informal contractors identified “*communication with shareholders*” to have a minimal impact on internal contractors' activities, while 31.3% and 18.1%, respectively, identified it to have a moderate impact and a significant impact on contractors' activities. Only 28.9% indicated that

it has an extensive impact. Given the results, it can be concluded that 31.3% of the informal contractors identified “*communication with shareholders*” as having an impact on activities in the construction industry.

In total, more than half 52.0% (20.7%+31.3%), of the informal contractors identified “*the presence of representatives*” to have an impact on their activities. A total of 20.4% and 27.6% of informal contractors were of the view that it impacts on the activities in the construction industry. In sum, 31.3% of the informal contractors, as the highest proportion of the contractors, indicated that “*the presence of representatives*” impacts activities in the construction industry.

Regarding the statement “*sharing information*”, 20.4% of the informal contractors indicated a minimal impact on their activities, while 29.9% and 17.8% respectively identified it as having a moderate and a significant impact on activities in the construction industry. However, 31.9% of the informal contractors identified “*sharing information*” to have an extensive impact on their activities in the construction industry.

A total of 50.3% (19.4+30.9%) of the informal contractors identified “*contracting experiences*” as a risk factor that impacts significantly and extensively on their activities in the construction industry. Only 19.1% of the informal contractors indicated that “*contracting experiences*” has no effect on their activities in the construction industry.

Regarding “*competency as a contractor*”, less than half of the informal contractors, hence 49.7% (22.4%+27.3%), identified it as a risk factor that has a significant and an extensive impact on their activities in the construction industry. Moreover, 17.1% indicated minimal impact, while 33.2% identified “*competency as a contractor*” as a risk factor that has a moderate impact on contractors’ activities in the construction industry. A total of 31.6% of the informal contractors identified “*conflict resolution*” as a risk factor that has a moderate impact, while 26.3% indicated it to have an extensive impact on informal contractors’ activities. Moreover, 22.4% identified “*conflict resolution*” as having a significant impact on their activities in the construction industry. Only 19.7% of the informal contractors indicated “*conflict resolution*” as a risk factor that has a minimum impact on the activities of their activities in the industry.

More than half, thus 51.0% (20.7+30.3%), of the informal contractors identified “*quality control measures*” as a risk factor that has a minimal and a moderate impact on the activities of informal contractors, while 30.3% and 18.8%, respectively, indicated that it has a significant and an extensive impact on their activities.

- **Purpose of the statements**

The purpose of the statements in Section D (Appendix A) of the questionnaire was to determine the *perceived occurrence of operational management risk factors on industry performance* that impact on activities of the construction industry. The frequency distributions of the informal contractors’ responses to the statements, as indicated in table 6.3 were categorised on a 5-point Likert scale (1 to 5) as follows: *not likely, least likely, less likely, likely, and most likely*.

5.4.2.10 Perceived occurrence of operational risk factors of management.

Table 5.3: Frequency distributions of informal contractors’ responses to the statements

Risk factors	Not likely		Least likely		Less likely		Likely		Most likely		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
D1. Decision making procedures	0	0,0	52	17,1	104	34,2	81	26,6	67	22,0	304	100
D2. Communication with shareholders	0	0,0	62	20,4	96	31,6	70	23,0	76	25,0	304	100
D3. The presence of representatives	0	0,0	68	22,4	99	32,6	48	15,8	89	29,3	304	100
D4. Sharing information	0	0,0	48	15,8	104	34,2	86	28,3	66	21,7	304	100
D5. Contracting experiences	0	0,0	58	19,1	93	30,6	59	19,4	94	30,9	304	100
D6. Competency as a contractor	0	0,0	52	17,1	101	33,2	68	22,4	83	27,3	304	100

- **Analysis of results**

Regarding “*decision making procedures*”, 34.2% of the informal contractors perceived it to be less likely to occur as a risk factor, which has an impact on the operational management of industry performance. In addition, 26.6% perceived “*decision making procedures*” likely to occur, while 22% perceived it most likely to occur as a risk factor that has an impact on operational management in the construction industry. Only 17.1% of the informal contractors perceived “*decision making procedures*” least likely to occur as a risk factor that impacts on operational management. In sum, the highest proportion of the informal contractors perceived

“decision making procedures” as less likely to occur as a risk factor that impacts on operational management in the construction industry.

Responding to the statement *“communication with shareholders”* almost half, thus 48% (23%+25%), of the informal contractors perceived the statement was likely and most likely to occur as a risk factor that impacts on operational management, while 20.4% considered the *“communication with shareholders”* as least likely, and 31.6% as less likely, respectively. The highest proportion of the respondents indicated that *“communication with shareholders”* is less likely (34.2%) to take place in the activities of contractors in the construction industry.

Responding to the statement *“the presence of representatives”*, 32.6% of the informal contractors it as less likely to occur, 29.3% indicated that it is most likely to occur, while 22.4% considered it as least likely to occur as a risk factor. Only 15.8% perceived *“the presence of representatives”* as likely to occur as a risk factor that impacts on operational management in the construction industry.

A total of 34.2% of the informal contractors perceived the statement *“sharing information”* as less likely to occur as a risk factor that impacts on operational management in the industry. This was followed by 28.3% and 21.7% likely and most likely to impact, respectively. However, only 15.8% of the informal contractors perceived *“sharing information”* as least likely to occur as a risk factor that impacts on the operational management in the construction industry.

Regarding the statement *“contracting experiences”*, 30.9% of the informal contractors stated that it was most likely to occur as a risk factor that impacts on operational management in the construction industry, while 30.6% indicated that it was less likely to occur as a risk factor in the industry. Moreover, 19.4% and 19.1% of the informal contractors, respectively, considered *“contracting experiences”* as least likely to and likely to occur as a risk factor that impacts on the operational management in the construction industry.

A total of 33.2% of the informal contractors perceived *“competency as a contractor”* as less likely to occur as a risk factor that impacts the operational management, while 22.4% considered it as likely and 27.3% as most likely to occur as a risk factor. Only 17.1% of informal contractors perceived *“competency as a contractor”* as least likely to occur as a risk factor that impacts operational management in the construction industry.

- **Purpose of the statements**

The purpose of the statements in Section E (Appendix A) of the questionnaire was to identify the *risk factors of project design* that impact on the activities of informal contractors in the construction industry. The frequency distributions of informal contractors' responses to the statements, as stated in table 5.4 below, were categorized on a 5-point Likert scale (1 to 5) as follows: *no effect, minimum, moderate, significant, and extensive*.

5.4.2.11 Identification of risk factors of project design

Table 5.4: Frequency distributions of informal contractors' responses to the statements

	No effect		Minimum		Moderate		Significant		Extensive		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
E1. Experience in design tasks	0	0,0	60	19,7	96	31,6	70	23,0	78	25,7	304	100
E2. Design nature unclear and confusing	0	0,0	38	12,5	99	32,6	73	24,0	94	30,9	304	100
E3. Clearer project documentation	0	0,0	51	16,8	91	29,9	72	23,7	90	29,6	304	100
E4. Design modification of documents	0	0,0	62	20,4	98	32,2	58	19,1	86	28,3	304	100
E5. Information gathering before design	0	0,0	50	16,4	100	32,9	73	24,0	81	26,6	304	100
E6. Clear drawing of projects	0	0,0	50	16,4	92	30,3	82	27,0	80	26,3	304	100

Analysis of results

Regarding the statement "*experience in design tasks*", less than half, namely 48.7% (23%+25.7%), of the informal contractors identified it as significant and extensive. Moreover, 31.6% identified "*experience in design tasks*" as a moderate risk factor of project design while 19.7% identified it as a minimal risk factor that impacts on informal contractors' activities in the construction industry.

Regarding the statement "*design nature unclear and confusing*", more than half, namely 56.6% (24.0%+32.6%), of the informal contractors identified it as significant and moderate. However,

30.9% identified “*design nature unclear and confusing*” as an extensive risk factor of project design, while only 12.5% identified it as a minimal risk factor of project design that impacts on informal contractors’ activities in the construction industry.

Regarding the statement “*clearer project documentation*”, 29.9% of the informal contractors identified it as a moderate risk factor. In addition, 29.6% identified “*clearer project documentation*” as an extensive risk factor of project design, while 23.7% identified it as a significant risk factor. Moreover, 16.8% of the informal contractors identified “*clearer project documentation*” as a minimal risk factor of project design that impacts on informal contractors’ activities in the construction industry.

Regarding the statement “*design modification of documents*”, 32.2% and 28.3% of informal contractors identified it as moderate and extensive respectively. Furthermore, 20.4% identified it as a minimal risk factor of project design, while 19.1% identified “*design modification of documents*” as a significant risk factor of project design that impacts on informal contractors’ activities in the construction industry.

Regarding the statement “*information gathering before design*”, 32,9% of the informal contractors identified it as a moderate risk factor, while 26.6% identified it as an extensive risk factor. In addition, 24% identified “*information gathering before design*” as a significant risk factor and 16.4% identified it as a minimal risk factor of project design that impacts on informal contractors’ activities in the construction industry.

Regarding the statement “*unclear drawing of projects*”, 30.3% of the informal contractors identified it as a moderate risk factor, while 27% and 26.3%, respectively, identified the statement as a significant and extensive risk factor. Only 16.4% identified “*unclear drawing of projects*” as a minimal risk factor of project design that impacts on informal contractors’ activities in the construction industry.

- **Purpose of the statements**

The purpose of the statements in Section F (Appendix A) of the questionnaire was to check the perceived occurrence of risk activities on project design in the construction industry. The frequency distributions of informal contractors’ responses to the statements, as stated in table

5.5 below, were categorized on a 5-point Likert scale (1 to 5) as follows: *not likely, least likely, less likely, likely, most likely*.

5.4.2.12 Perceived occurrence of risk factors on project design.

Table 5.5: Frequency distributions of informal contractors' responses to the statements

	Not likely		Least likely		Less likely		Likely		Most likely		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
F1. Experience in design tasks	0	0,0	71	23,4	98	32,2	47	15,5	88	28,9	304	100
F2. Nature of project design	0	0,0	50	16,4	103	33,9	63	20,7	88	28,9	304	100
F3. Design nature unclear and confusing	0	0,0	41	13,5	90	29,6	95	31,3	78	25,7	304	100
F4. Clearer project documentation	0	0,0	66	21,7	96	31,6	46	15,1	96	31,6	304	100
F5. Design modification of documents	0	0,0	46	15,1	112	36,8	78	25,7	68	22,4	304	100
F6. Information gathering before design.	0	0,0	43	14,1	104	34,2	81	26,6	76	25,0	304	100
F7. Clear drawing of projects	0	0,0	75	24,7	97	31,9	45	14,8	87	28,6	304	100

Analysis of results

Regarding the statement “*experience in design tasks*”, 32.2% of the informal contractors perceived it as less likely to occur as a risk factor, while 28.9% perceived it as most likely to occur as a risk activity on project design. A total of 23.4% and 15.5% of the informal contractors, respectively, considered “*experience in design tasks*” as less likely and as likely to occur as a risk activity on project design.

Regarding the statement “*nature of project design*”, 33.9% of the informal contractors perceived it as less likely to occur as a risk activity on project design. Almost half, thus 49.6% (20.7%+28.9%), considered it likely and most likely to occur as a risk activity on project design, while 16.4% perceived it as least likely to occur as a risk activity on project design in the construction industry.

Regarding the statement “*design nature unclear and confusing*”, 31.3% of the informal contractors perceived it as likely to occur, while 29.6% considered it as less likely to occur as a risk activity during project design. Moreover, 25.7% of them perceived “*design nature*

unclear and confusing” as likely to occur, while 13.5% considered it as least likely to occur as a risk activity on project design in the construction industry.

Regarding the statement “*clearer project documentation*”, 31.6% of the informal contractors perceived it as likely to occur, while a similar number considered it as less likely to occur as a risk activity during project design. Moreover, 21.7% of the informal contractors considered “*clearer project documentation*” as least likely and 15.1% as likely to occur as a risk activity on project design in the construction industry.

Regarding the statement “*design modification of documents*”, 36.8% of the informal contractors perceived it as less likely to occur, while 25.7% perceived it as likely to occur as a risk activity during project design. Moreover, 22.4% considered “*design modification of documents*” as most likely to occur, and 15.1% as least likely to occur as a risk activity during project design in the construction industry.

Regarding the statement “*information gathering before design*”, 34.2% of the informal contractors perceived it as less likely to occur. Moreover, 26.6% considered “*information gathering before design*” as likely to occur as a risk activity that impacts on project design. A further 25% perceived it as most likely to occur, while the remaining informal contractors, 14.6%, considered it as least likely to occur as a risk activity during project design in the construction industry.

Regarding the statement “*clear drawings of projects*”, 31.9% of the respondents perceived it as likely to occur, while 28.6% perceived it as most likely to occur. A further 24.7% perceived the “*clear drawings of projects*” as least likely and 14.8% considered it as likely to occur as a risk activity during project design in the construction industry.

Purpose of the statements

The purpose of the statements in Section G (Appendix A) of the questionnaire was to identify the *risk factors of finance* that impact on the activities of informal contractors in the construction industry. The frequency distributions of the informal contractors’ responses to the statements, as stated in table 5.6 below, were categorized on a 5-point Likert scale (1 to 5) as follows: *no effect, minimum, moderate, significant, and extensive*.

5.4.2.13 Identification of risk factors of finance

Table 5.6: Frequency distributions of informal contractors' responses to the statements

	No effect		Minimum		Moderate		Significant		Extensive		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
G1. Completed work paid for	0	0,0	54	17,8	121	39,8	66	21,7	63	20,7	304	100
G2. Funding projects by contractors	0	0,0	48	15,8	95	31,3	69	22,7	92	30,3	304	100
G3. Levels of cash flow analysis	0	0,0	62	20,4	96	31,6	52	17,1	94	30,9	304	100
G4. Estimate of cost accuracy	0	0,0	46	15,1	112	36,8	64	21,1	82	27,0	304	100

Analysis of results

Regarding the statement “*completed work paid for*”, 39.8% of the informal contractors identified it as a moderate risk factor, 21.7% as an extensive risk factor, and 20.7% as a risk factor that has a significant impact on the finances of informal contractors in the construction industry. The remaining 17.8% identified “*completed work paid for*” as a minimal risk factor that impacts on the finances of informal contractors in the construction industry.

A total of 31.3% of the informal contractors identified the statement “*funding projects by contractors*” as a moderate risk factor that impacts on the activities of informal contractors in the construction industry, while 30.3% considered it as an extensive risk factor. Moreover, 22.7% perceived it as a risk factor that has a significant impact on the activities of informal contractors in the construction industry. The remaining 15.8% perceived “*funding projects by contractors*” as having a minimal impact on the activities of informal contractors in the construction industry.

A total of 31.6% of the informal contractors identified the statement “*levels of cash flow analysis*” as a moderate risk factor that impacts on the activities of informal contractors in the construction industry, while 30.9% considered it as an extensive risk factor. In addition, 20.4% perceived “*levels of cash flow analysis*” as a risk factor that has a minimal impact on their activities, and 17.1% considered it to have a significant impact on the activities of informal contractors in the construction industry.

Regarding the statement “*estimate of cost accuracy as a risk factor of finance*”, 36.8% of the informal contractors considered it as a risk factor that has a moderate impact on their activities in the construction industry. Furthermore, 27% perceived “*estimate of cost accuracy as a risk factor of finance*” as having an extensive impact, while 21.1% of them considered it as a risk factor that has a significant impact on their activities in the construction industry. The remaining 15.1% perceived it to have a minimal impact on the activities of the informal contractors.

- **Purpose of the statements**

The purpose of the statements in Section H (Appendix A) of the questionnaire was to check the perceived occurrence of operational financial risk activities of informal contractors in the construction industry. The frequency distributions of the informal contractors’ responses to the statements, as stated in table 5.7 on the next page were categorized on a 5-point Likert scale (1 to 5) as follows: *not likely, least likely, less likely, likely, and most likely*.

5.4.2.14 Perceived occurrence of operational financial risk factors.

Table 5.7: Frequency distributions of informal contractors’ responses to the statements

	Not likely		Least likely		Less likely		Likely		Most likely		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
H1. Completed work paid for	0	0,0	46	15,1	98	32,2	81	26,6	79	26,0	304	100
H2. Funding projects by contractors	0	0,0	67	22,0	96	31,6	59	19,4	82	27,0	304	100
H3. Levels of cash flow analysis	0	0,0	53	17,4	107	35,2	75	24,7	69	22,7	304	100
H4. Estimate of cost accuracy	0	0,0	57	18,8	101	33,2	56	18,4	90	29,6	304	100

Analysis of results

A total of 32.2% of the informal contractors indicated that “*completed work paid for*” was likely to occur as an operational financial risk activity, while 26.6% indicated that it was likely and 26% most likely to occur as an operational financial risk activity in the construction industry. Moreover, 15.1% of the informal contractors stated that it was least likely to occur as an operational financial risk activity in the construction industry.

A total of 46.4% (19.4%+27%) perceived “*funding projects by contractors*” as likely and most likely to occur as an operational financial risk activity within the construction industry. Furthermore, 31.6% and 22% perceived it as least and less likely to occur as an operational financial risk in the construction industry.

More than half, namely 52.6% (17.4+35.2%), of the informal contractors perceived the statement “*level of cash flow analysis*” to least likely and likely to occur, while 24.7% and 22.7%, respectively, considered it as likely and as most likely to occur as an operational financial risk activity in the construction industry.

A total of 33.2% of the informal contractors perceived the “*estimate of cost accuracy*” as less likely to occur as a risk activity, while 20.9% of them perceived it as most likely to occur as an operational activity in the construction industry. Moreover, 18.8% of the informal contractors considered the “*estimate of cost accuracy*” as least likely to occur, while the remaining 18.4% of the informal contractors considered it as likely to occur as a risk activity in the construction industry.

Purpose of the statements

The purpose of the statements in Section I (Appendix A) of the questionnaire was to identify *risk factors of materials* that impact on project qualities and completion by contractors in the construction industry. The frequency distributions of informal contractors’ responses to the statements, as stated in table 5.8 below, were categorized on a 5-point Likert scale (1 to 5) as follows: *no effect, minimum, moderate, significant, and extensive*.

5.4.2.15 Identification of the *risk factors of materials*

Table 5.8: Frequency distributions of informal contractors’ responses to the statements

	No effect		Minimum		Moderate		Significant		Extensive		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
11. Enough materials for construction	0	0,0	65	21,4	100	32,9	50	16,4	89	29,3	304	100,0
12. Material quality sub-standard	0	0,0	55	18,1	105	34,5	74	24,3	70	23,0	304	100,0
13. Material changes during construction	0	0,0	59	19,4	106	34,9	49	16,1	90	29,6	304	100,0
14. Challenges of material suppliers	0	0,0	55	18,1	97	31,9	68	22,4	84	27,6	304	100,0

15. Handling materials wastages	0	0,0	58	19,1	99	32,6	73	24,0	74	24,3	304	100,0
16. Material compliance by contractors	0	0,0	62	20,4	98	32,2	66	21,7	78	25,7	304	100,0
17. Materials delivery by suppliers	0	0,0	57	18,8	101	33,2	65	21,4	81	26,6	304	100,0

Analysis of results

A total of 32.9% of the informal contractors considered the statement “*enough materials for construction*” as a moderate risk factor, while 29.3% considered it an extensive risk factor that impacts on project qualities and completion by contractors in the construction industry. Moreover, 21.4% were of the view that “*enough materials for construction*” has a minimal impact and 16.4% perceived it to have a significant impact on project qualities and completion in the construction industry.

Regarding the statement “*material quality sub-standard*”, a total of 34.5% and 18.1% of the informal contractors, respectively, identified it as a risk factor that has a moderate to a minimal impact on project qualities and completion in the construction industry. Moreover, 24.3% and another 23% of the informal contractors, respectively, identified “*material quality sub-standard*” as a risk factor that has a significant to an extensive impact on project qualities and completion in the construction industry.

Regarding the statement “*materials changes during construction*”, 34.9% of the informal contractors identified it as a risk factor that has a moderate impact on project qualities and completion in the construction industry, while 29.6% identified it as a risk factor that has a significant impact on project qualities and completion in the construction industry. Moreover, 19.4% and 16.1%, respectively, identified “*materials changes during construction*” as a risk factor that has a minimal to a significant impact on project qualities and completion in the construction industry.

Regarding the statement “*challenges of materials supplies*”, 31.9% of the informal contractors identified it as a risk factor that has a moderate impact on project qualities and completion in the construction industry. A further 27.6% identified it as a risk factor that has an extensive impact on project qualities and completion in the construction industry, while 22.4% and 18.1%, respectively, identified “*challenges of materials supplies*” as a risk factor that has a significant to a minimal impact on project qualities and completion in the construction industry.

Regarding the statement “*handling material wastages*”, 32.6% of the informal contractors identified it as a risk factor that has a moderate impact on project qualities and completion in the construction industry, while 24.3% and 24%, respectively, identified it as a risk factor that has an extensive as well as a significant impact on project qualities and completion in the construction industry. Moreover, 19.1% identified “*handling material wastages*” as a risk factor that has a minimal impact on project qualities and completion in the construction industry.

Based on the statement “*material compliance by contractors*”, 32.2% and 25.7% of the informal contractors identified it as a risk factor that has a moderate to extensive impact on project qualities and completion. In addition, 21.7% identified it to have a significant impact, while 20.4% of the informal contractors identified “*material compliance by contractors*” as having a minimal impact on project qualities and completion in the construction industry.

A total of 33.2% and 27.3% of the respondents respectively identified the statement “*materials delivery by suppliers*” as a risk factor that has a moderate to extensive impact on project qualities and completion in the construction industry. Furthermore, 21.4% identified “*materials delivery by suppliers*” as a risk factor that has a significant impact, while 18.8% said it has a minimal impact on project qualities in the construction industry.

Purpose of the statements

The purpose of the statements in Section J (Appendix A) of the questionnaire was to determine the perceived occurrence of operational activities related to materials in the construction industry.

The frequency distributions of the informal contractors’ responses to the statements, as stated in table 5.9, were categorized on a 5-point Likert scale (1 to 5) as follows: *not likely, least likely, less likely, likely, and most likely*.

5.4.2.16 Perceived occurrence of operational activities related to materials.

Table 5.9: Frequency distributions of informal contractors' responses to the statements

	Not likely		Least likely		Less likely		Likely		Most likely		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
J1. Enough materials for construction	0	0,0	59	19,4	95	31,3	67	22,0	83	27,3	304	100,0
J2. Material quality sub-standard	0	0,0	62	20,4	95	31,3	58	19,1	89	29,3	304	100,0
J3. Material changes during construction	0	0,0	60	19,7	98	32,2	59	19,4	87	28,6	304	100,0
J4. Challenges of material suppliers	0	0,0	55	18,1	95	31,3	78	25,7	76	25,0	304	100,0
J5. Handling materials wastages	0	0,0	58	19,1	102	33,6	64	21,1	80	26,3	304	100,0
J6. Material compliance by contractors	0	0,0	60	19,7	95	31,3	66	21,7	83	27,3	304	100,0
J7. Materials delivery by suppliers	0	0,0	66	21,7	101	33,2	62	20,4	75	24,7	304	100,0

Analysis of results

Responding to the statement “*enough materials for construction*”, 31.3% of the respondents perceived it as less likely to occur, while 27.3% perceived it as most likely to occur as an operational activity related to materials in the construction industry. Moreover, 22% of the informal contractors perceived “*enough materials for construction*” as likely to occur and 19.4% considered it as least likely to occur as an operational activity related to materials in the construction industry.

Responding to the statement “*material quality sub-standard*”, 31.3% of the respondents perceived it as less likely to occur, while 29.3% perceived it as most likely to occur as an operational activity related to materials in the construction industry. In addition, 20.4% of the informal contractors perceived “*material quality sub-standard*” as least likely to occur, while 19.1% considered it as less likely to occur as an operational activity related to materials in the construction industry.

Responding to the statement “*material changes during construction*”, 32.2% considered it as less likely to occur, while 28.6% perceived it as most likely to occur as an operational activity related to materials in the construction industry. A further 19.4% of the informal contractors considered it as most likely to occur, while 19.7% perceived “*material changes during*

construction” as least likely to occur as an operational activity related to materials in the construction industry.

Responding to the statement “*challenges of material suppliers*”, 31.3% perceived it as less likely to occur while 25.7% and 25% respectively perceived it as likely and most likely to occur as an operational activity related to materials in the construction industry. Only 18.1% of informal contractors perceived “*challenges of material suppliers*” as least likely to occur as an operational activity in the construction industry.

Responding to the statement “*handling material wastages*”, 33.6% of the respondents perceived it as less likely to occur, while 26.3% perceived it as most likely to occur as an operational activity related to materials in the construction industry. Moreover, 21.1% of informal contractors perceived “*handling material wastages*” as likely to occur, while 19.1% perceived it as least likely to occur as an operational activity related to materials in the construction industry.

Responding to the statement “*material compliance by contractors*”, 31.3% perceived it as less likely to occur, while 27.3% and 21.7% respectively considered it likely and as most likely to occur as an operational activity related to materials in the construction industry. Only 19.7% of informal contractors considered “*material compliance by contractors*” as least likely to occur as an operational activity related to materials in the construction industry.

Responding to the statement “*material delivery by suppliers*”, 33.2% perceived it to be less likely to occur, while 24.7% and 20.4% respectively perceived it as most likely and as likely to occur as an operational activity related to materials in the construction industry. A further 21.7% of the informal contractors considered “*material delivery by suppliers*” as least likely to occur as an operational activity related to materials in the construction industry.

Purpose of the statements

The purpose of the statements in Section K (Appendix A) of the questionnaire was to identify the effect of risk factors relating to project equipment by contractors during construction activities in the construction industry. The frequency distributions of informal contractors’

responses to the statements, as stated in table 5.10 below, were categorized on a 5-point Likert scale (1 to 5) as follows: *no effect, minimum, moderate, significant, extensive*.

5.4.2.17 Identification of risk factors of project equipment

Table 5.10: Frequency distributions of informal contractors’ responses to the statements

	No effect		Minimum		Moderate		Significant		Extensive		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
K1. Availability of contracting equipment	0	0,0	54	17,8	104	34,2	74	24,3	72	23,7	304	100
K2. Efficiency of equipment	0	0,0	69	22,7	94	30,9	62	20,4	79	26,0	304	100
K3. Knowledge of equipment	0	0,0	61	20,1	104	34,2	66	21,7	73	24,0	304	100
K4. Servicing and warranties of equipment	0	0,0	51	16,8	101	33,2	77	25,3	75	24,7	304	100

Analysis of results

Responding to the statement “*availability of contracting equipment*”, 34.2% of the informal contractors considered it to have a moderate effect, while 24.3% and 23.7% respectively considered it to have a significant and an extensive effect, while the remaining 17.8% of the informal contractors identified “*availability of contracting equipment*” as having a minimal effect on the risk factors relating to project equipment by contractors during construction activities.

Responding to the statement “*efficiency of equipment*”, 30.9% of the informal contractors considered it to have a moderate effect on the risk factors, while 26% and 20.4% respectively considered it to have a significant and an extensive effect on the risk factors. The remaining 22.7% of the informal contractors identified “*efficiency of equipment*” as having a minimal effect on the risk factors relating to project equipment by contractors during construction activities.

Responding to the statement “*knowledge of equipment*”, 34.2% of the informal contractors identified it to have a moderate effect on the risk factors, while 24% and 20.1% respectively identified it to have an extensive and minimal effect on the risk factors. The remaining 21.7%

of the informal contractors identified “*knowledge of equipment*” to have a significant effect on the risk factors relating to project equipment by contractors during construction activities.

Responding to the statement “*servicing warranties of equipment*”, 33.2% of the informal contractors considered it to have a moderate effect on the risk factors, while 25.3% and 24.7% respectively considered it to have a significant and an extensive effect on the risk factors. The remaining 16.8% identified “*servicing warranties of equipment*” to have a minimal effect on the risk factors relating to project equipment by contractors during construction activities.

Purpose of the statements

The purpose of the statements in Section L (Appendix A) of the questionnaire was to determine the perceived occurrence of operational activities related to project equipment by contractors during construction activities in the construction industry. The frequency distributions of the informal contractors’ responses to the statements, as stated in table 5.11 below, were categorized on a 5-point Likert scale (1 to 5) as follows: *not likely, least likely, less likely, likely, most likely*.

5.4.2.18 Perceived occurrence of operational activities related to project equipment.

Table 5.11: Frequency distributions of informal contractors’ responses to the statements

	Not likely		Least likely		Less likely		Likely		Most likely		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
L1. Availability of contracting equipment	0	0,0	54	17,8	96	31,6	74	24,3	80	26,3	304	100
L2. Efficiency of equipment	0	0,0	64	21,1	97	31,9	55	18,1	88	28,9	304	100
L3. Knowledge of equipment	0	0,0	59	19,4	107	35,2	56	18,4	82	27,0	304	100
L4. Servicing and warranties of equipment	0	0,0	43	14,1	96	31,6	92	30,3	73	24,0	304	100

Analysis of results

Responding to the statement “*availability of contracting equipment*”, 31.6% of the informal contractors considered it as less likely to occur as an operational activity related to project equipment, while 26.3% and 24.3% respectively considered it as most likely and likely to occur as an operational activity related to project equipment. The remaining 17.8% of the informal

contractors considered “*availability of contracting equipment*” as likely to occur as an operational activity related to project equipment during construction activities.

Responding to the statement “*efficacy of equipment*”, 31.9% of the informal contractors considered it as less likely to occur as an operational activity related to project equipment, while 28.9% perceived it as most likely, and 21.1% as least likely to occur as an operational activity related to project equipment. A further 18.1% of the informal contractors perceived “*efficacy of equipment*” as likely to occur as an operational activity related to project equipment during construction activities.

Responding to the statement “*knowledge of equipment*”, 35.2% of the informal contractors considered it as less likely to occur as an operational activity related to project equipment, while 27% perceived it as most likely and 19.4% least likely to occur as an operational activity related to project equipment. A further 18.4% of the informal contractors considered “*knowledge of equipment*” as likely to occur as an operational activity related to project equipment during construction activities.

Responding to the statement “*servicing and warranties of equipment*”, 31.6% of the informal contractors considered it as less likely to occur, while 30.3% considered it as likely to occur. A total of 24% considered “*servicing and warranties of equipment*” as most likely to occur and 14.1% of the informal contractors perceived it as least likely to occur as an operational activity related to project equipment during construction activities.

Purpose of the statements

The purpose of the statements in Section M (Appendix A) of the questionnaire was to identify risk factors that are related to labour and the impact on the activities of the contractors in the construction industry. The frequency distributions of informal contractors’ responses to the statements, as stated in table 5.12 below were categorized on a 5-point Likert scale (1 to 5) as follows: *no effect, minimum, moderate, significant, and extensive*.

5.4.2.19 Identification of the risk factors related to labour.

Table 5.12: Frequency distributions of informal contractors’ responses to the statements

	No effect	Minimum	Moderate	Significant	Extensive	Total

	N	%	N	%	N	%	N	%	N	%	N	%
M1. Performance by labour	0	0,0	66	21,7	83	27,3	49	16,1	106	34,9	304	100
M2. Conditions of labour in the industry	0	0,0	52	17,1	106	34,9	52	17,1	94	30,9	304	100
M3. Related skills of contractors	0	0,0	45	14,8	99	32,6	79	26,0	81	26,6	304	100
M4. Productivity of quality products	0	0,0	70	23,0	91	29,9	39	12,8	104	34,2	304	100
M5. Labour disputes/during strikes	0	0,0	58	19,1	107	35,2	66	21,7	73	24,0	304	100
M6. Contractors' labour sub-standard	0	0,0	50	16,4	101	33,2	79	26,0	74	24,3	304	100

Analysis of results

Responding to the statement *“performance by labour”*, 34.9% of the informal contractors identified it as an extensive risk factor, while 27.3% identified it as a moderate risk factor, and 21.7% considered it a minimal risk factor related to labour and the impact on the activities of the contractors in the construction industry. The remaining 16.1% identified *“performance by labour”* as a significant risk factor related to labour and the impact on the activities of the contractors in the construction industry.

Responding to the statement *“conditions of labour in the industry”*, 34.9% of the informal contractors identified it as a moderate risk factor, while 30.9% identified it as an extensive risk factor, and 17.1% as a minimum risk factor that relates to labour and the impact on the activities of the contractors in the construction industry. The remaining 17.1% identified *“conditions of labour in the industry”* as a significant risk factor that is related to labour and the impact on the activities of the contractors in the construction industry.

Responding to the statement *“related skills of contractors”*, 32.6% of the informal contractors identified it as a moderate risk factor, while 26% identified it as a significant risk factor. A further 26.6% identified *“related skills of contractors”* as an extensive risk factor and the remaining 14.8% identified it as a minimal risk factor related to labour and the impact on the activities of the contractors in the construction industry.

Responding to the statement *“productivity of quality products”*, 34.2% of the informal contractors identified it as an extensive risk factor, while 29.9% identified it as a moderate risk

factor, and a further 23% as a minimal risk factor. The remaining 12.8% of the informal contractors identified “*productivity of quality products*” as a significant risk factor related to labour and the impact on the activities of the contractors in the construction industry.

Responding to the statement “*labour disputes/during strikes*”, 35.2% of the informal contractors identified it as a moderate risk factor, while 24% identified it as an extensive risk factor, and a further 21.7% as a significant risk factor. The remaining 19.1% of the informal contractors identified “*labour disputes/during strikes*” as a minimal risk factor related to labour and the impact on the activities of the contractors in the construction industry.

Responding to the statement “*contractors labour sub-standard*”, 33.2% of the informal contractors identified it as a moderate risk factor, while 26% it as a significant risk factor, and a further 24.3% as an extensive risk factor. The remaining 16.4% of the informal contractors identified “*contractors labour sub-standard*” as a minimal risk factor related to labour and the impact on the activities of the contractors in the construction industry.

Purpose of the statements

The purpose of the statements in Section N (Appendix A) of the questionnaire was to determine the occurrence of operational activities related to labour in the construction industry. The frequency distributions of the informal contractors’ responses to the statements, as stated in table 5.13 below, were categorized on a 5-point Likert scale (1 to 5) as follows: *not likely, least likely, less likely, likely, most likely*.

5.4.2.20 Perceived occurrence of operational activities related to labour.

Table 5.13: Frequency distributions of informal contractors’ responses to the statements

	Not likely		Least likely		Less likely		Likely		Most likely		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
N1. Performance by labour	0	0,0	60	19,7	100	32,9	56	18,4	88	28,9	304	100
N2. Conditions of labour in the industry	0	0,0	56	18,4	104	34,2	64	21,1	80	26,3	304	100
N3. Related skills of contractors	0	0,0	55	18,1	95	31,3	70	23,0	84	27,6	304	100
N4. Productivity of quality products	0	0,0	55	18,1	101	33,2	68	22,4	80	26,3	304	100

N5. Labour disputes/during strikes	0	0,0	61	20,1	104	34,2	57	18,8	82	27,0	304	100
N6. Contractors' labour sub-standard	0	0,0	53	17,4	110	36,2	62	20,4	79	26,0	304	100

Analysis of results

Responding to the statement “*performance by labour*”, 32.9% of the informal contractors considered it as less likely to occur, while 28.9% considered it most likely to occur as an operational activity related to labour in the construction industry. A further 19.7% further perceived it as least likely to occur and 18.4% perceived it as likely to occur as an operational activity in the construction industry.

Responding to the statement “*conditions of labour in the industry*”, 34.2% of the informal contractors considered it as less likely to occur, while 26.3% considered it as most likely to occur as an operational activity that relates to labour in the construction industry. Furthermore, 21.1% perceived “*conditions of labour in the industry*” as likely to occur and 18.4% as least likely to occur as an operational activity in the construction industry.

Responding to the statement “*related skills of contractors*”, 31.2% of the informal contractors considered it as less likely to occur, while 27.6% considered it as most likely to occur as an operational activity that relates to labour in the construction industry. A further 23% perceived the “*related skills of contractors*” as likely to occur and 18.4% perceived it as least likely to occur as an operational activity in the construction industry.

Responding to the statement “*productivity of quality skills*”, 33.2% of the informal contractors perceived it as less likely to occur, while 26.3% perceived it as most likely to occur as an operational activity that relates to labour in the construction industry. A further 22.4% considered it as likely to occur and 18.1% considered it as least likely to occur as an operational activity in the construction industry.

Responding to the statement “*labour disputes during strikes*”, 34.2% of the informal contractors perceived it as less likely to occur, while 27% perceived it as most likely to occur as an operational activity that relates to labour in the construction industry. Moreover, 20.1%

perceived “labour disputes during strikes” as least likely to occur, and the remaining 18.8% considered it as less likely to occur as an operational activity in the construction industry.

Responding to the statement “contractors’ labour sub-standard”, 36.2% of the informal contractors considered it as less likely to occur, while 26% perceived it as most likely to occur as an operational activity that relates to labour in the construction industry. A further 20.4% perceived “contractors’ labour sub-standard” as likely to occur and 17.4% considered it as least likely to occur as an operational activity in the construction industry.

Purpose of the statements

The purpose of the statements in Section 0 (Appendix A) of the questionnaire was to identify the *risk factors of the external environment that impact project qualities/completion* by contractors in the construction industry. The frequency distributions of informal contractors’ responses to the statements, as stated in Table 5.14 below, were categorized on a 5-point Likert scale (1 to 5) as follows: *no effect, minimum, moderate, significant, extensive*.

5.4.2.21 Identification of the risk factors of the external environment.

Table 5.14: Frequency distributions of informal contractors’ responses to the statements

	No effect		Minimum		Moderate		Significant		Extensive		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
O1. Public disorder and civil disruptions	0	0,0	47	15,5	102	33,6	73	24,0	82	27,0	304	100
O2. Problems with competitors	0	0,0	64	21,1	100	32,9	52	17,1	88	28,9	304	100
O3. Permission by local authorities	0	0,0	50	16,4	108	35,5	53	17,4	93	30,6	304	100
O4. Changes in local legislations	0	0,0	50	16,4	96	31,6	70	23,0	88	28,9	304	100
O5. Interference by stakeholders	0	0,0	64	21,1	100	32,9	59	19,4	81	26,6	304	100
O6. Weather conditions	0	0,0	53	17,4	103	33,9	76	25,0	72	23,7	304	100
O7. Political interference	0	0,0	56	18,4	99	31,8	78	25,7	71	23,4	304	100

Analysis of results

A total of 51% (24+27%) of the informal contractors identified “public disorders and disruptions” as a significant and extensive risk factor that impacts the external environment, while 33.6% indicated it as having a moderate effect, and 15.5% identified it as a risk factor of

the external environment that has a minimal impact on project qualities and completion by contractors in the construction industry.

A total of 32.9% of the informal contractors identified “*problems with competitors*” as a moderate risk factor that influences the external environment that impacts project qualities and completion in the construction industry. A further 21.1% identified “*problems with competitors*” as a minimal risk factor, in contrast to 17.1% that identified it as a significant risk factor, and 28.9% as an extensive risk factor that influences the external environment that impacts project qualities and completion in the construction industry.

A total of 35.5% of the informal contractors identified “*permission by local authorities*” as a moderate risk factor, while 30.6% identified it as an extensive risk factor of the external environment that impacts project qualities and completion by contractors in the construction industry. The remaining 17.4% and 16.4%, respectively, identified “*permission by local authorities*” as a significant and a minimal risk factor of the external environment that impacts project qualities and completion in the construction industry.

More than half of the informal contractors, namely 51.9% (23.0+28.9%), identified “*changes in local legislation*” as a significant and extensive risk factor of the external environment that impacts project qualities, while 31.6% identified it as a moderate risk factor. The remaining 16.4% of the informal contractors identified “*changes in local legislation*” as a minimal risk factor that impacts project qualities and completion by contractors in the construction industry.

A total of 32.9% of the informal contractors identified “*interference by shareholders*” as a moderate risk factor, while 26.6% identified it as an extensive risk factor of the external environment that impacts project qualities and completion by contractors in the construction industry. Moreover, 19.4% of the informal contractors identified “*interference by shareholders*” as a risk factor that has a significant impact. The remaining 21.1% identified it as a risk factor that has minimal impact on the external environment of project qualities and completion by contractors in the construction industry.

A total of 33.9% of the informal contractors identified “*weather conditions*” as a moderate risk factor of the external environment that impacts project qualities, while 25% and 23.7%, respectively, identified it as a significant and an extensive risk factor. The remaining 17.4% of the informal contractors identified “*weather conditions*” as a minimal risk factor that impacts project qualities and completion by contractors in the construction industry.

A total of 31.8% of the informal contractors identified “political interference” as a moderate risk factor, while 25.7% and 23.4% respectively identified it as a significant and an extensive risk factor of the external environment that impacts project qualities and completion by contractors. Moreover, 18.4% of the informal contractors identified “political interference” as a minimal risk factor of the external environment that impacts project qualities and completion by contractors in the construction industry.

Purpose of the statements

The purpose of the statements in Section P (Appendix A) of the questionnaire was to identify which of the risk factors occur most frequently. The frequency distributions of the informal contractors’ responses to the statements, as stated in table 5.15 below, were categorized on a 5-point Likert scale (1 to 5) as follows: *not likely, least likely, less likely, likely, most likely*.

5.4.2.22 Perceived occurrence of operational risk factors favorable to external environment.

Table 5.15: Frequency distributions of informal contractors’ responses to the statements

	Not likely		Least likely		Less likely		Likely		Most likely		Total	
	N	%	N	%	N	%		%	N	%	N	%
P1. Public disorder and civil disruptions	0	0,0	64	21,1	101	33,2	47	15,5	92	30,3	304	100
P2. Problems with competitors	0	0,0	53	17,4	109	35,9	62	20,4	80	26,3	304	100
P3. Permission by local authorities	0	0,0	51	16,8	107	35,2	69	22,7	77	25,3	304	100
P4. Changes in local legislations	0	0,0	65	21,4	101	33,2	52	17,1	86	28,3	304	100
P5. Interference by stakeholders	0	0,0	55	18,1	106	34,9	50	16,4	93	30,6	304	100
P6. Weather conditions	0	0,0	53	17,4	97	31,9	76	25,0	78	25,7	304	100
P7. Political interference	0	0,0	59	19,4	101	33,2	62	20,4	82	27,0	304	100

Analysis of results

About 33.2% of informal believed the statement “public disorder and civil disruptions” is likely to occur as operational factor of the external environment while 30.3% of informal contractors believed the statement is most likely, 21.1% believed the statement is least likely to occur as

operational factor of external environment in the construction industry. The remaining 15.5% of informal contractors believed “public disorder and civil disruptions” to occur as operational factor of the external environment in the construction industry.

A total of 35.9% of informal contractors believed the statement “problems with competitors” is less likely to occur while 26.3% indicated the statement is most likely and 20.4% believed the statement to occur as operational factor of the external. The remaining 17.4% of informal contractors believed the statement is least likely to occur as operational factor of external environment in the construction in the construction industry.

About 35.2% of informal contractors believed the statement “permission by local authorities” is less likely to occur while 25.3% believed the statement is most likely to occur as operational factor of external environment. Only 22.7% believed the statement is likely while 16.8% believed the statement is least likely to occur as operational factor of external environment.

A total of 33.2% of informal contractors believed the statement “changes in local legislations” is less likely to occur as operational factor favourable to the external environment. In total, 28.3% of informal contractors believed that the statement is most likely to occur while 21.4% indicated least likely to occur as operational factor favourable to the external environment. Only 17.1% of the remaining informal contractors believed that statement is likely to occur as an operational factor to the external environment of the construction industry.

A total of 30.6% of informal contractors believed the statement “interferences by stakeholders” is most likely to occur, 34.9% believed the statement is less likely to occur as operational factor of the external environment in the construction industry. About 16.4% and 18.1% believed the statement is likely and least likely to occur as operational factor favourable to the external environment of the construction industry.

Roughly 31.9% of informal contractors believed the statement “weather condition” is less likely to occur, 27.7% and 25% is likely and most likely to occur as operational factor favourable to the external environment of the construction industry. A total of 17.4% of informal contractors believed the statement least likely to occur as operational factor to the external environment of the construction industry.

In total, 33.2% of informal constructors believed that the statement “political interferences” is less likely to occur as operational factor favourable to the external environment while 27.0% stated that statement most likely, 20.4% believed that the statement is likely to occur as operational factor favourable to the external environment. Only 19.4% of informal contractors believed the statement least likely to occur as operational factor favourable to the external environment in the construction industry.

5.4.3 DESCRIPTIVE FOR MEAN AND STANDARD DEVIATION

Table 5.16: Impact of management risk factors at different levels of the likelihood of management risk factors.

Level of likelihood	N	Mean(M)	Std. Deviation (SD)
Low	87	58,66	9,72
Moderate	135	59,88	9,89
High	82	60,39	10,27
Total	304	59,67	9,93

Analysis of table 5.16 reveals the highest impact of management risk factors scores (M= 60.39) when the level of likelihood management risk factors is high. In addition, there is a smallest impact of management risk factor score (M=58.66) when level of likelihood of management risk factors is low. Furthermore, there is a consistent impact of management risk factors (SD=9,72) when the level of likelihood of management risk factors is low.

Table 5.17: Impact of project design factors at different levels of the likelihood of project design risk factors.

Level of likelihood	N	Mean (M)	Std. Deviation (SD)
Low	79	60,51	9,89
Moderate	144	58,95	9,61
High	81	60,71	10,20
Total	304	59,83	9,85

Analysis of table 5.17 reveals the highest impact of project design risk factors scores. (M= 60.71) when the level of likelihood of project design risk factors is high. In addition, there is a lowest impact of project design risk factor score (M=58.95) when the level of likelihood of

project design risk factors is moderate. Furthermore, there is a consistent impact of project design risk factors (SD=9,61) when the level of likelihood of project design risk factors is moderate.

Table 5.18: Impact of the financial risk factors at different levels of the likelihood of financial risk factors.

Level of Likelihood	N	Mean	Std. Deviation
Low	117	58,34	11,04
Moderate	95	59,05	11,72
High	92	60,73	9,87
Total	304	59,29	10,93

Analysis of table 5.18 reveals the highest impact of financial risk factors scores. (M= 60.73) when the level of likelihood financial risk factors is high. In addition, there is a lowest impact of financial risk factor score (M=58.34) when the level of likelihood of financial risk factors is low. Furthermore, there is a consistent impact of financial risk factors (SD=9.87) when the level of the likelihood of financial risk factors is high.

Table 5.19: Impact of material risk factors at different levels of the likelihood of materials risk factors.

Level of Likelihood	N	Mean	Std. Deviation
Low	84	58,30	9,65
Moderate	99	58,73	8,35
High	121	59,10	8,21
Total	304	58,75	8,65

Analysis of table 5.19 above reveals the highest impact of materials risk factors scores. (M= 59.10) when the level of likelihood materials risk factors is high. In addition, there is a lowest impact of materials risk factor score (M=58.30) when the level of likelihood of materials risk factors is low. Furthermore, there is a consistent impact of materials risk factors (SD=8.21) when the level of the likelihood of materials risk factors is high.

Table 5.20: Impact of the project equipment risk factors at different levels of the likelihood of project equipment risk factors.

Level of Likelihood	N	Mean(M)	Std. Deviation (SD)
Low	111	55,14	10,28
Moderate	102	57,98	11,29
High	91	62,37	10,00
Total	304	58,26	10,92

Analysis of table 5.20 reveals the highest impact of project equipment risk factors scores (M= 62.37) when the level of likelihood project equipment risk factors is high. In addition, there is a lowest impact of project equipment risk factor score (M=55.14) when the level of likelihood of project equipment risk factors is low. Furthermore, there is a consistent impact of project equipment risk factors (SD=10) when the level of the likelihood of project equipment risk factors is high.

Table 5.21: Impact of the labour risk factors at different levels of the likelihood of labour risk factors.

Level of likelihood	N	Mean	Std. Deviation
Low	117	58,38	10,90
Moderate	92	61,22	9,23
High	95	60,21	9,64
Total	304	59,81	10,07

Analysis of table 5.21 above reveals the highest impact of labour risk factors scores (M= 61.22) when the level of likelihood labour risk factors is moderate. In addition, there is a lowest impact of labour risk factor score (M=58,38) when the level of likelihood of labour risk factors is low. Furthermore, there is a consistent impact of labour risk factors (SD=9.23) when the level of the likelihood of labour risk factors is moderate.

Table 5.22: Impact of the external environment risk factors at different levels of the likelihood of external environment risk factors.

Level of likelihood	N	Mean	Std. Deviation
Low	91	58,07	8,43
Moderate	124	59,38	8,72
High	89	60,40	8,19

Total	304	59,29	8,50
-------	-----	-------	------

Analysis of table 5.22 reveals the highest impact of external environment risk factors score (M= 60.40) when the level of likelihood of external environment risk factors is high. In addition, there is a lowest impact of external environment risk factor score (M=58,07) when the level of likelihood of external environment risk factors is low. Furthermore, there is a consistent impact of external environment risk factors (SD=8.19) when the level of the likelihood of external environment risk is high.

5.4.4 INFERENTIAL ANALYSIS

Inferential statistics according to Salkind (2015), is a statistical tool that enables the researcher to extrapolate empirical outcomes from a smaller research participant to a much larger size. The application of inferential tools throughout this empirical study allows the researcher to make generalization of the entire research sample size (Christensen et al, 2011; Shava et al., 2016; Allmark & Machaczek, 2018). Some of the statistical tools that are employed for inferences of empirical data include the Analysis of Variance (ANOVA), correlation coefficient and regression statistical tools. This study applied the ANOVA statistical tool to assist in making sense of the formulated (null and alternate) hypotheses. McHugh (2011) defined the ANOVA as a vital process of statistic that applies F-ratio to assess the overall fit of a linear. Furthermore, it is applied in a scientific setting to ascertain whether any possible significant differences exist between the means of three or more groups of independent variables (Field, 2009 cited in Mhlongo, 2014). The following section depicts the statistical tool of ANOVA to test the hypotheses. In testing the null and alternate hypotheses, the researcher applied ANOVA to determine the significance between two variables.

H_{1N}: The level of likelihood of management risk factors has no significant effect on the impact of management related risk factors.

H_{1A}: The level of likelihood of management risk factors has a significant effect on the impact of management related risk factors.

Table 5.23: Analysis of variance (ANOVA) test

Source	Sum of Squares	df	Mean Square	F	p	eta squared
--------	----------------	----	-------------	---	---	-------------

Between Groups	136,641	2	68,320	0,691	0,502	0,005
Within Groups	29749,470	301	98,835			
Total	29886,111	303				

Table 5.23 shows that a one-way between-groups analysis of variance was conducted to explore the effect of the level of likelihood of management risk factors on the impact of the management of risk factors. The levels of likelihood of management risk factors were divided into three levels:(low, moderate, and high). There was no statistically significant difference at the 5% level of significance in the impact of management risk factor scores for the three levels of management risk factors: [F (2,301) =0,691, p=0.502]. Therefore, the null hypothesis (H_{1N}) is not rejected. Despite not reaching statistical significance, the actual difference in mean scores between the groups was quite small. The effect size, calculated using eta squared, was 0.005.

H_{2N} : The level of likelihood of project design risk factors has no significant effect on the impact of project design related risk factors.

H_{2A} : The level of likelihood of project design risk factors has a significant effect on the impact of project design related risk factors.

Table 5.24: Analysis of variance (ANOVA) test

Source	Sum of Squares	df	Mean Square	F	p	eta-squared
Between Groups	210,292	2	105,146	1,085	0,339	0,007
Within Groups	29175,447	301	96,928			
Total	29385,739	303				

Table 5.24 above shows that a one-way between-groups analysis of variance was conducted to explore the effect of the level of likelihood of project design risk factors on the impact of the project design risk factors. The levels of likelihood of project design risk factors were divided into three levels:(low, moderate, and high). There was no statistically significant difference at the 5% level of significance in the impact of project design risk factor scores for the three levels of project design risk factors: [F (2,301) =1.085, p=0.339]. Therefore, the null hypothesis (H_{2N})

is not rejected. Despite not reaching statistical significance, the actual difference in mean scores between the groups was quite small. The effect size, calculated using eta squared, was 0.007.

H3_N: The level of likelihood of financial risk factors has no significant effect on the impact of financial related risk factors.

H3_A: The level of likelihood of financial risk factors has a significant effect on the impact of financial related risk factors.

Table 5.25: Analysis of variance (ANOVA) test

	Sum of Squares	df	Mean Square	F	p	eta-squared
Between Groups	301,555	2	150,778	1,263	0,284	0,008
Within Groups	35921,466	301	119,340			
Total	36223,021	303				

Table 5.25 shows that a one-way between-groups analysis of variance was conducted to explore the effect of the level of likelihood of financial risk factors on the impact of the financial risk factors. The levels of likelihood of financial risk factors were divided into three levels:(low, moderate, and high). There was no statistically significant difference at the 5% level of significance in the impact of financial risk factor scores for the three levels of financial risk factors: [F (2,301) =1.263, p=0.284]. Therefore, the null hypothesis (**H3_N**) is not rejected. Despite not reaching statistical significance, the actual difference in mean scores between the groups was quite small. The effect size, calculated using eta squared, was 0.008.

H4_N: The level of the likelihood of material risk factors has no significant effect on the impact of material related risk factors.

H4_A: The level of the likelihood of material risk factors has a significant effect on the impact of material related risk factors.

Table 5.26: Analysis of variance (ANOVA) test

Source	Sum of Squares	df	Mean Square	F	p	eta- squared
Between Groups	31,652	2	15,826	0,210	0,810	0,001
Within Groups	22656,639	301	75,271			

Total	22688,290	303				
-------	-----------	-----	--	--	--	--

Table 5.26 above shows that a one-way between-groups analysis of variance was conducted to explore the effect of the level of likelihood of materials risk factors on the impact of the materials risk factors. The levels of likelihood of materials risk factors were divided into three levels:(low, moderate, and high). There was no statistically significant difference at the 5% level of significance in the impact of materials risk factor scores for the three levels of likelihood of materials risk factors: [F (2,301) =0,210, p=0.810]. Therefore, the null hypothesis (H_{4N}) is not rejected. Despite not reaching statistical significance, the actual difference in mean scores between the groups was quite small. The effect size, calculated using eta squared, was 0,001.

H_{5N} : The level of the likelihood of project equipment risk factors has no significant effect on the impact of project equipment related risk factors.

H_{5A} : The level of the likelihood of project equipment risk factors has a significant effect on the impact of project equipment related risk factors.

Table 5.27: Analysis of variance (ANOVA) test

Source	Sum of Squares	df	Mean Square	F	p	eta- squared
Between Groups	2624,801	2	1312,400	11,790	0,000	0,073
Within Groups	33505,442	301	111,314			
Total	36130,243	303				

Table 5.27 shows that a one-way between-groups analysis of variance was conducted to explore the effect of the level of likelihood of project equipment risk factors on the impact of the project equipment risk factors. The levels of likelihood of project equipment risk factors were divided into three levels:(low, moderate, and high). There was a statistically significant difference at the 5% level of significance in the impact of project equipment risk factor scores for the three levels of likelihood of project equipment risk factors: [F (2,301) =11.790, p=0.000]. Therefore, the null hypothesis (H_{5N}) is rejected. Despite reaching statistical significance, the actual difference in mean scores between the groups was moderately large. The effect size, calculated using eta squared, was 0,073.

H_{6N} : The level of the likelihood of labour risk factors has no significant effect on the impact of labour related risk factors.

H6A: The level of the likelihood of labour risk factors has a significant effect on the impact of labour related risk factors.

Table 5.28: Analysis of variance (ANOVA) test

Source	Sum of Squares	df	Mean Square	F	p	eta- squared
Between Groups	439,442	2	219,721	2,185	0,114	0,014
Within Groups	30267,335	301	100,556			
Total	30706,778	303				

Table 5.28 shows that a one-way between-groups analysis of variance was conducted to explore the effect of the level of likelihood of labour risk factors on the impact of the labour risk factors. The levels of likelihood of labour risk factors were divided into three levels:(low, moderate, and high). There was a statistically significant difference at the 5% level of significance in the impact of labour risk factor scores for the three levels of likelihood of labour risk factors: [F (2,301) =2.185, p=0.114]. Therefore, the null hypothesis (**H6N**) is not rejected. Despite not reaching statistical significance, the actual difference in mean scores between the groups was quite small. The effect size, calculated using eta squared, was 0,0.014.

H7N: The level of the likelihood of external environment risk factors has no significant effect on the impact of external environment related risk factors.

H7A: The level of the likelihood of external environment risk factors has a significant effect on the impact of external environment related risk factors.

Table 5.29: Analysis of variance (ANOVA) test

Source	Sum of Squares	df	Mean Square	F	p.	eta- squared
Between Groups	246,030	2	123,015	1,710	0,183	0,011
Within Groups	21658,950	301	71,957			
Total	21904,980	303				

Table 5.29 shows that a one-way between-groups analysis of variance to explore the effect of the level of likelihood of external environment risk factors on the impact of the external environment risk. The levels of likelihood of external environment risk factors were divided into three levels:(low, moderate, and high). There was a statistically significant difference at the 5% level of significance in the impact of external environment risk factor scores for the three levels of likelihood of external environment risk factors: [F (2,301) =1.710, p=0.183]. Therefore, the null hypothesis ($H7_N$) is not rejected. Despite not reaching statistical significance, the actual difference in mean scores between the groups was quite small. The effect size, calculated using eta squared, was 0.011. The table below depicts a summarised version of the formulated null and alternate hypotheses designed to determine the statistical significant between the variables.

Table 5.30: Summary of the outcomes of formulated research hypotheses.

S/N	Path relationship	Formulated Hypotheses	Applicable statistical tool.	Outcomes
$H1_N$	Opinion of informal contractors -> management related risk factors.	The level of likelihood of management risk factors has no significant effect on the impact of management related risk factors.	Anova test	Not rejected
$H2_N$	Opinion of informal contractors -> Project design related risk factors.	The level of likelihood of project design risk factors has no significant effect on the impact of project design related risk factors.	Anova test	Not rejected
$H3_N$	Opinion of informal contractors-> financial related risk factors.	The level of likelihood of financial risk factors has no significant effect on the impact of financial related risk factors.	Anova test	Not rejected
$H4_N$	Opinion of informal contractors -> material related risk factors.	The level of the likelihood of material risk factors has no significant effect on the impact of material related risk factors	Anova test	Not rejected
$H5_N$	Opinion of informal contractors-> Project related risk factors.	The level of the likelihood of project equipment risk factors has no significant effect on the impact of project related risk factors	Anova test	Rejected
$H6_N$	Opinion of informal contractors ->labour related risk factors.	The level of the likelihood of labour risk factors has no significant effect on the impact of labour related risk factors.	Anova test	Not rejected
$H7_N$	Opinion of informal contractors ->external environment related risk factors	The level of the likelihood of external environment risk factors has no significant effect on the impact of external environment related risk factors	Anova test	Not rejected

5.4.5 QUALITATIVE DATA ANALYSIS

This empirical study presents qualitative data after the quantitative analysis was finalized. Qualitative findings entail FGDs through interviews of selected informal contractors from the FSP. The FGDs were scheduled with group members based on all the interview protocols. In analysing the qualitative data, the researcher familiarized himself through rigorous search for insights into various patterns that emerged from the FGDs transcriptions. Transcription excerpts that showed common features were grouped into themes and sub-themes (Braun & Clarke, 2006). Field data were presented based on comments and evaluations of informal contractors' responses as recommended by Merriam (2002).

The researcher followed these processes to provide enough evidence of each theme and sub-themes that surfaced from the field data. In total, 18 informal contractors consisting of three groups (group A, B, and C) of 6 informal contractors per group selected to participate in 20 minutes FGDs for two weeks. All the group members were present except one contractor from group C who cited family commitments for not attending two sessions. The researcher selected experienced contractors based mainly on the nature of the construction industry. The FGDs were conducted during weekends in a prearranged community hall. The dates and times for the FGDs were communicated to all the group members.

The primary purpose was to present, interpret, discuss, and conduct analysis of qualitative outcomes through FGDs. Specific steps through thematic analysis based on qualitative data as explained by Braun and Clarke (2006) were followed. Using the thematic approach entails the application of photo voices that enables the researcher to familiarize for meanings and patterns in a written format. During this qualitative outcome, the researcher utilized Merriam (2002) approaches which states that qualitative data be in comments assessments and responses by individual participants to substantiate each theme and sub-themes that emerged from responses. Table 6.31 below provides detailed summaries of the main themes as well as sub-themes based on qualitative thematic analysis.

The demographics of informal contractors during this empirical study is confined to 8 local municipalities selected from district municipalities in the FSP. Eighteen contractors from informal economy of different grades participated in gathering data. To ensure personal protection as well as privacy for the participants, pseudonyms were applied. The table below

outlines the CIDB gradings of the informal contractors as well as their demographic distributions. Table 5.31 depicts informal contractors’ demographics and CIDB grades with assigned pseudonyms to group members. Membership composition of each group consists of 6 informal contractors. The grade levels of the members mostly males range from 3-9 respectively.

Table 5.31: Demographic and CIDB grading distributions.

Pseudonyms	Participants and gender			Grade levels
Group A	Participant	(Male)	A1	Level 8
	Participant	(Female)	A2	Level 3
	Participant	(Male)	A3	Level 7
	Participant	(Male)	A4	Level 7
	Participant	(Male)	A5	Level 4
	Participant	(Male)	A6	Level 4
Group B	Participant	(Male)	B1	Level 3
	Participant	(Male)	B2	Level 3
	Participant	(Male)	B3	Level 4
	Participant	(Male)	B4	Level 7
	Participant	(Male)	B5	Level 7
	Participant	(Male)	B6	Level 9
Group C	Participant	(Male)	C1	Level 7
	Participant	(Male)	C2	Level 9
	Participant	(Male)	C3	Level 8
	Participant	(Male)	C4	Level 3
	Participant	(Male)	C5	Level 3
	Participant	(Male)	C6	Level 4

Source: Design for the study.

5.4.6 Qualitative data presentation and discussion of findings.

This section presents the qualitative data based on the findings that were presented by means of FGDs of themes and sub-themes that emerged through the analysis. The themes and sub-themes that emerged were linked to the stated objectives that the study sought to achieve. The primary research question that this study sought to provide answers was “*what is the impact of risk factors on informal contractors’ operations in the construction industry*”? The researcher generated different sub-questions for probing during the FGDs. Qualitative data analysis was an ongoing process that commenced during the data gathering procedure. Data from the FGDs

were qualitatively analysed to highlight participants (informal contractors) responses which stated the most significant outcomes through the thematic processes that was supported by extracts from group (A, B or C) members consisting of informal contractors.

Purposive sampling technique was used to select informal contractors who obtained grades ranging from 3 to 8 in line with CIDB qualifications. Both male and female contractors participated in the FGDs. However, only few female participants work as informal contractors in the construction industry. The FGDs was conducted over two weeks in community halls very close to participants’ residencies. Each discussion lasted for 90 minutes. Privacy and anonymity of informal contractors remained hidden as the researcher used pseudonyms to replace the names of each participant. As the FGDs progressed, themes and sub-themes that remain prominent throughout the research data were identified by the researcher. This was followed by themes and sub-themes that emerged. Themes and sub-themes below represent the reflections of the participants’ (informal contractors) views and perceptions of industry. Adequate consideration was given to further insights through probing for more information to ensure that the objectives were achieved. All the refined themes and sub-themes that emerged from the analysis and linked to each of the objectives are stated in table 5.32 below.

Table 5.32: Themes and sub-themes that emerged from informal contractors.

Themes	Sub-themes	Objectives
1. Skills acquired in the construction industry	1.1 Different skill levels from artisans to architect, builders, contractors and design risk factors. 1.2 Labour -related skills	1. To establish the risk factors of informal contractors in the construction industry.
2. Experienced of risk in the construction industry.	2.1. Risk of internal and external nature 2.2. Different risk levels depend on specific nature of project operations.	2. To examine the nature of risk factors in the construction industry.
3. Risk knowledge	3.1 Little risk knowledge difficult to perform task in the industry. 3.2 Knowledge of risk is good for project success. 3.3 the construction industry is complex; risk knowledge is good	3. To identify the significance of the risk factors of the construction industry.

4. Form of risk management.	<p>4.1 Scarcely risk management in the construction industry.</p> <p>4.2 Wearing the designated protective clothes and shoes.</p> <p>4.3 Check for fire extinguishers, insurance to protect all employees.</p>	4. To evaluate the types of risk factors that impede operations of informal contractors
5. High and low risks impact on the industry	<p>5.1 Risks impacts are always high and extensive not moderate during operations.</p> <p>5.2 This result to multiple and severe disasters</p>	Objectives: 2 and 4
	<p>5.3 Construction industry is characterized by low to high with huge costs resulting in huge delays.</p> <p>5.4 Economic risks related factors (oil, prices, global financial crises and exchange rates).</p> <p>5.5 Creates project failures due to risks, lack of equipment.</p>	Objectives: 2 and 4
6. Ways to grow construction industry through finances.	<p>6.1 Growth indicators, control risk factors, better communication, high priority, financial risks to be curtailed.</p> <p>6.2 The need to acquire materials at lower quality costs.</p> <p>6.3 Risk factors to be controlled through training programs.</p>	Objective: 4

Theme 1: The skills acquired in the construction industry.

This emerged from the question “*what level of risk did you acquire in the construction industry?*” The question was designed not only to achieve **objective one** that states “*to establish the risk factors of informal contractors in the construction industry*” but to also ascertain whether the requisite skills enable the contractors to operate on projects. Only one sub-theme emerged from the main theme. This sub-theme related to different skill levels including artisans, architects, builders, contractors and design risk factor. The general agreement was that all participants have acquired different levels of skills except one member from group C. One

informal contractor from group A mentioned that it is very important to acquire the minimum skills in the construction industry. This sentiment was agreed to by all members of the group. However, one of the experienced members from group C who worked in the industry for almost 20 years further stated,

“From the start, I only knew how to lay bricks and mix cement during project operations; members agreed that skills acquisition is vital for the success of the industry especially project designthat is unclear documentations, modification of project documents”.

The sentiments that were shared by informal contractors reflected the outcomes of recent study by Adedokun, Akinmusire and Aje (2016) who stated that acquiring the relevant skills is paramount to the development of the industry. In their views, every successful project operation is without adequate internal support systems from project stakeholders including the project manager.

Sub-theme 1.1: Different skill levels from artisans, architects’, builders, and contractors.

Based on the questions stated above, most of the participants have indicated a low achievement of skills just as builders in the construction industry. One member from group C responded, *“I always view the issue of skills in the construction industry very boring but critical; skill is a necessary tool no matter the level”.* Another member from group C stated:

“If one needs to become efficient and progressive in the construction industry, one need to take the issue of skills training at every level in the industry, pay “big” money for it and spend more time in search of skills required to operate” without skills nothing in the industry is certainthough; in fact, we need to be practical with handy skills in the industry; more spending is needed.

Another member from group B add:

“Skills and project go together The two are linked without one the other is likely to fail surely because is a multi-task industry working in a chain of practical skills from one person to another. The industry requires the services of handy contractors with “big experience”. Without practical experience, even if one gets all the skills, you are most likely to fail.

The overwhelming majority from group A were of the view that “practical and handy” skills are the type of skills that every contractor needs to operate in the mix of an industry that continue

to experience severe risks of different proportions.” This outcomes from the members of group A was not consistent with a study by Sitharam and Hoque (2016) that revealed that lack of financial competency contributes to growing failure rates in the industry.

Sub-theme 1.2: Labour related skills.

The researcher spent more time to probe the issues of labour as an *internal risk factors* that is related to understand the working climate of the industry including employees’ skills levels. The issues of labour and skills form part of the FGDs across all the three groups that emerged from informal contractors’ responses. For example, diversity of culture groups linked to employees feature numerous and creates language barriers during operations. The primary extracts across the FGDs were presented by one member from group C:

“My personal experience of 10 years in the industry.....contractors from old-age cultural settings lack the knowledge to manage the risk factors. There is lack of qualified employees in.....no qualified employeesbecause of these we lack the knowledge and the expertise in our working environment”. “The present changes in inflation-riddle economic condition leads to severe labour supply challenges,,,,,,inadequate quality control measures, leading to more rework and rampant delays.....poorer safety supervisors”. The finding was confirmed during a study by Carvalho and Rabechini (2015) that it has become impossible to produce and deliver quality products on time due to inefficiencies in quality control, safety measures and better control.

Theme 2: Experienced of risk in the construction industry.

Theme 2 emerged from the FGDs to seek answers to the question “*what level of skill did you acquire in the construction industry?*?”. To ensure that the stated **objective** is realized, the researcher allowed members of the focus groups to respond to the above question. It became clear that majority became contractors over the years in the industry. The questions highlighted the significance of *project design risk factors* experience in the construction industry. One of the informal contractors from group C remarked:

“In this industry, it is only experienced that can make you money as you provide quality projects, building better and lasting houses”. “He further emphasized how

he was trained to mix concrete and has since then become “guru in concrete works.....I mix with high speed...the skills in project design, I am very weak no training.

It further emerged from the FGDs that the construction industry incurs large **financial risk factors** of expenses due to materials spoilage because of inexperienced contractors in the industry. Many of the members from group C agreed with the statement. Two issues have emerged. This includes financial and project risk factors of the construction industry. The outcomes confirmed a similar study by Ofori (2013) that rated financial constraints to be contributors to severe delays in project delays. Another study by Violante (2018) also found that lack of project design and inconsistencies by contractors present significant challenges to the industry.

Members of group A stated:

“.. wish no one approach the industry....with lesser or no skill and experience”.

Though most of the participants acquired some basic construction skills, it was clear that across the research areas, the participants are aware that lack of skills create severe risk across the industry’s environment. Another elderly member from group A add:

“Where there is no skill.....it becomes more difficult as materials bought are ‘wasted, lack production of quality products meaning projects and project designs become weaker”.

These findings agreed with another empirical study by Banaitiene, Banaitis and Norkus (2011) that individual skills as and **internal risk factors** contribute to the industry’s sustainability and growth. Similar study in the past by Enshassi et al (2009) stated that internal risks including materials impact adversely on projects in the construction industry due to lack of handling because of skill deficiencies by the constructors.

Sub-theme 2.1: Risk of external and internal nature.

Sub-theme 2.1 was linked to the question “*what level of skills did you acquire in the construction industry?*”

During the FGDs, many informal contractors shared the views that risks either of **internal or external nature** must be taken seriously and kept under control in the industry. Based on their responses, it seems that the participants understood and can differentiate between internal and external risks.

One participant from group C responded:

“Yooo for risk, either from within or wherever even outside, is the industry number “one killer”. “It doesn’t matter where it comes from the key is how it is managed as we operate in the industry .. without that the construction industry is gone bigtime, no profit”.

One critical issue that surfaced during the discussions was that in their views, external risks are beyond their powers as industry players.

“Such risks cannot be stopped; external risks are unstoppable during operations in the construction industry; we are not powerful enough to stop external risks”.

Another participant from group B stated:

In the end, it emerged those risks from external environment in particular needs industry role-player’s attention. Commenting further on sub-theme 2, another participant remarked *“for external risks, ...we can all manage provided we receive early notification depending on the type and nature of the risknot only at the destruction phase”.*

This outcome further confirmed past research by Windapo, Omeife and Wahap (2010) that both external and internal risk factors influence projects growth and continuity. The study adds that stricter control measures are required to enable and enhance the project success. Besides, the findings agree with study by Adedokun, Akinmusire and Aje (2016) indicating that project design factors are likely to cause enormous harm to successful project operations/

Sub-theme 2.2: Different risk levels depending on specific nature of risk.

During the FGDs, the researcher discovered that not much was known about different risk levels. This may be because of lack of informal knowledge and information. However, one participant stated:

“project has specific riskinternal risks only ...no external risk for project across the local market”

There was overwhelming agreement as most of the participants nodded their heads as the remark was made. One member from group A disagreed to the statement saying,

“Projects in general are faced with risk as early as the introduction phase of a project till the end at times.....”.

A member from group C stated:

“risk must be managed from early stages of every project to the time the project is completed and hand over to rightful clients and documentations signedthe issue of risk is very much concerning in the construction industry”

Theme 3: Risk knowledge

The researcher used several minutes to probe the question “*what is your level of knowledge in risk*”? The aim was to determine whether informal contractors understand the depth of risk impact in terms of design, product quality, sustainability, and the general operations. Given the responses from all the group members, it was eminent that the impact of risk is known to all the informal contractors in the industry. In sum, there is a high level of risk knowledge by members in the industry. Further discussions revealed that the participants were aware of the risky consequences. It also emerged during the FGDs that the nature and levels of risk depends on project phase. This implies that risk impact becomes very severe at various phases of each project. According to one member from group C,

“each project is unique, risk differs depending what, which, where a project is carried outthe depth and impact of risk deepen during building bridges including operational climates”. “also sir, we have the know-how what we need is about practical applications to see and feel; after all knowledge is power, we got the knowledge as contractors, we produce quality products for communitiesbut eish!, but we at times do not see materials and human risk coming”

Sub-theme 3.1: Little risk knowledge, difficult to perform task in the industry.

The researcher derived the sub-theme from responses of the informal traders to achieve the stated **objective** “*to identify the significance of the risk factors in the construction industry*”. During interaction with all the responses, not much was gathered. However, the general idea was that most informal contractors demonstrated that without adequate risk knowledge, operations in the industry become more difficult as tasks during operations continue to fail. One member from group B stated,

“Without the relevant operational knowledge, nothing works in the industry....it becomes a total failure”. Agreeing further to the comment, another member added “it is not easy to work in an industry without having the knowledgethis may be due to high risk volumes within the construction industrybut we are

knowledgeable of our protective clothes during operations as another form of riskthat is internal “. “It is in the interest of the industry to use the best risk management and awareness practices to support operations”. These responses support the findings of a study by Adeleke et al (2019) that showed that adopting efficient risk management practices in the industry impact positively on operations. Supporting similar sentiments was a study by Chang et al (2018) that revealed that ability to manage risk during construction of projects is central to prevent adverse effects.

Sub-theme 3.2: Knowledge of risk is good for project success.

Emanating from theme 3, many of the members (from group A, B and C) gave support to the opinion that for project to be successful, one needs enough risk knowledge. Besides, all the responses from the group pointed that without risks knowledge the construction industry is doomed to fail. In sum their responses meant:

“any construction team need knowledge of risk to earn good name..... produce quality product to consumers and clients”.

However, another member with more industry experience from group C responded:

“personally I need education that is practical, then the risk knowledgegoing “pele” will follow like water”. The strategy of working without risk knowledge is only good for rampant failures not success ..never”. This finding was the reflection of previous study conducted by Chihuri and Pretorius (2011) that draws on the knowledge, information, experience and judgement as the means of identifying risk in the construction industry.

Sub-theme 3.3: Industry is complex, risk knowledge enhances operations.

Having probed all the participants for responses in different groups, it emerged that all but a few informal contractors understood the complex nature of complex nature of the industry. According to their responses, risk in the industry must be prioritized at its highest for better and quality operations.

“We understood what risk can do to contractors and the construction industry especially those of us operating in informal economy... risks by its nature is leaving us without a cent where we failed to be knowledgeable through learning by practical meanstraining programs; the only way is to put our little experiences to test”. Further agreement to the statement, another member (very experienced) from group B stated: “No one can survive ...EISH in this industry without risk knowledge, whether in projects, building bridges or roads, risk is just risk”. The present outcomes that emerged from the responses of informal contractors agree with past study by Kanni (2014) that revealed that clusters of risk factors could result to project cost overruns and prevent project success.

Theme 4: Types of risk factors in the construction industry.

Through a very lengthy probing, one of the members (though with lesser experience in the industry) from group A stated:

“risk management is no “mangamanga” risk differs from other forms management since commitment to manage risk refers to providing support through strategies in the industry .. Every day I experience several risk factors especially money to buy materials very hard and frustrating for me. I wish I can follow all the processes from the book in the industry. Simply put, in the construction industry, it is important to know who does what and how well to sustain the industry as risk factor of funding is managed”.

However, many of the participants did not perceive that risk in any way is better managed for protection and growth of the construction industry.

“I don’t know any form of risk management around “mina” here in this industry ... we just operate and at times pay our expenses; scarcely for them to experience how and what form of risk to be managed by us in the industry.....however, I am aware that risk factors in all forms exist in the industry. The issue is the management of all the risk factors”

However, one member from group C reiterated:

“only our uniforms, shoes and head protectors are used to manage possible risk factors that are personal, materials, equipment, design .. all these are some of the risk factors because no money to work with in the industry”.

Based on the responses of all the informal contractors, there is no risk management process to specifically manage all the different risk factors in the industry though the risk factors are

known and rarely occurred. It is eminent that not much is done in the construction industry in informal economy to identify different risk factors in the industry. The findings could be lined to a study by Kanni, Oke and Akpomiemie (2014) that agreed to the different risk factors such as issues of cash flow, unnecessary project variations and lack of adequate coordination leads to ballooning project costs and delivery.

Sub-theme 4.2: Scarcely risk management

Further probing to understand the level and extent of risk factors in the industry, sub-themes that emerged from the analysis were used to assist in achieving the stated **objective**. Given the general observation that was based on the responses from different groups, it was eminent that the industry is confronted with various risk factors. However, little risk management is practiced in the industry because of lack of lack of resources. This statement is supported by the view of a member from group C:

“I never see real risk management to counter so many risks to determine the application of management. The nature and its form is non-existent at my place of work.....I operate while taking care of myself to survive”. The researcher probed further for more insights.

Another member from the same group (group C) stated:

“Different risk factors lesser risk management issues in the construction industry that is largely influenced by all the requirements of the Occupational Health and Safety Act (OHSA) 85/1993 as well as the construction regulations. “According to the member, “the rules guiding the construction industry is focus on hazards and risk identification procedures, safe working operations in an environment that forces risk to be managed ... taking into consideration the risk factors .. not much is done in the industry”.

Sub-theme 4.2: Wearing correct protective clothes.

The overall response showed that informal contractors know the different forms of risks and its management. However, to successfully managed each risk, resources are required. For instance, providing strong and reliable clothing forms part of the strategy to manage the risk. Active management of any form of risk means understanding all the risk factors. One member stated:

“All that we do is to make sure all our clothing are use during operations. Once the resources are available, we are bound to ----- use to avoid not to be fired; the industry requires resources and materials to provide quality”.

Responding further to same issue, another group A member stated:

“I am always in need of real risk management actions to reduce possible failures and create growth and to take care for us”.

Sub-theme 4.3: Check for extinguishers, insurance to protect employees.

The general view that emerged from the question *“Does your company conduct any form of risk management?”*. This question revealed negative sentiments by majority of informal contractors. The implication therefore is that not much was done to manage risk in the industry.

Based on the above, one member from group B said:

“I never saw any risk management strategy since I start to work on projects...our cloths the best protection against insurance risks.”

Another contractor from group A (though less experienced) in the industry, stated:

“Not much in my view since I started as a contractor in the industry...is complex nature”.

All the members of group A and C supported the notion that risk management is scarcely talk and discuss in the industry. These findings are in sharp contrast to a recent study commissioned by Ajmi and Makinde (2018) who echoed the views that it is vital that projects risk factors are managed to increase project success rate.

Theme 5: High and Low risk impact on the construction industry

“Construction risk factors are severe, its severity can easily destroy the industry, most often we experience high to very high effect across our operations leading to under performance and poor-quality end-products” a member from group A stated.

These were some of the sentiments expressed by participants during FGDs. Besides, it emerged from the discussions that some of the risk factors may have insignificant impact on operations. Further response from another member of group C add:

“In an industry such as the construction, it became very difficult to trace the risk impact low or highthere are strings flow of operation, the operational chain is massive; the risk may seems very low from the start.....but going “pele” the impact of the risk factors become great and destructive”.

Responding to the same question, another member from group A agreed.

“there is no low or high impact here at this place of workwe take care that no risk occur but the risk factors are deep and occur no matter the operations. all either human or otherwise, more so during operations clients are in our minds, so care is taken to avoid impact.... That is massive destruction of projects and loss of “moola” and time”. The findings regarding the severity of risk factors in the industry was consistent with recent study by Dannreuther and Perren (2012) who revealed that no matter the nature and the type of risk factors, its impact is critical to the industry.

Sub-theme 5.1: Impact of risk high, extensive not moderate in the construction industry.

Informal contractors responded to questions during the FGDs. The overall responses revealed mixed sentiments; some group members viewed the impact of risk to be high and extensive while others agreed that risk impact was moderate on their business operations. These responses further outlined the depth of understanding risk management and its effect on operations in the construction industry. According to one member from group A:

“yes risk impact is high as we can see through our daily operations; consequences of risk impact is seen everywhereeven our products, projects and cash flows revealed increase in risks”.

Others slightly disagreed with the sentiment shared by a member from group A saying.

“Risk impact was not a daily or frequent occurrence in the industry ...or I cannot view the impact as I operate due to lack of proper risk management strategies”

Sub-theme 5.2: Results on multiple and severe disasters

After much probing for answers and related responses, the participants (informal contractors) indicated that the nature of risk continues to cause disaster during project operations. However, informal contractors were unable to indicate the scale of severity regarding the industry disasters. This implies that the participants, mainly informal contractors, found it very difficult to understand either the systems and processes used during risk management or the depth of risk in the construction industry. One member from group A revealed:

“No idea of disaster.... not a cluevery difficult one to understand”

Responding (one of the experienced and oldest) to same question from group C add:

“This issue of construction risk and disaster need some additional support ...to us as contractors in the industry...operations most often are normal and well.. so, what is the issue?”

Sub-theme 5.3: Construction industry is characterized by low to high with huge costs and delays.

The sub theme aimed to understand the reasons for project delays and costs of operations. From the responses of informal contractors, it was eminent that delays in respect of projects lead to high operational costs in the construction industry. A member from group B was of the view that the industry was largely crippled by high costs and severe risk factors:

*“This industry is faced with different risk that are **internal risk factors** of operations, materials, equipment, designs, human and others, to me financial risk factors play huge roles ...risks climb higher due to finances”* another member added.

“The only risk contributor (factor) here is that of finances to the industry. “I don’t know why operational costs are highat times it delay the processes of operations that impact on deliveries of finished products and projects.

Sub-theme 5.4: Economic risk related factors (oil prices, global financial crisis, exchange rates).

During the FGDs, the researcher asked the group members questions on the major economic challenges. Most of the informal contractors were able to identify several economic related risks that were linked to different constructs of the study. These include the **external risks** such as market demand, changes in economic climate, the prices of oil and the global financial crisis. One member from group A stated:

“The prices of oil plays critical role in the creation of several economic challenges,thus, a major risk factor in the industry. For instance, increase in price means project contracts, material prices, labour related needs increases in the organization”.

Besides, another member from group C further stated:

“Economic risks factors (***Internal risk factors***) that impede the smooth industry operations of all the projectsthese include immediate changes in priceslack (shortages) of equipment ...manpower shortages and material scarcity”.

The above statement implies that the general dependency on the prices of oil has a drastic negative impact on the construction industry and its performance including every operational cycle within the construction industry. Increased oil prices have significant “knock-on-effect” on project delivery, quality and the entire pricing mechanisms.

Sub-theme 5.5: Creates project failures due to risk, lack of equipment.

The sub-theme aimed to understand project failures. Based on responses, detailed sentiments that emerged entailed that project failures are due to so many factors of risks. From the responses it was clear during the FGDs that projects failed due to risk factors linked to equipment, materials, and even human elated risks. One member from group C indicated:

“*Our project failures are because of finance and also human risk factors*”. *Other environmental risks need financial planning to reduce the impact, for me I don't believe in project failures projects failed where insufficient funding becomes a challenge*”.

Another member from group C:

“We need equipment and materials to perform project operations all these can be possible provided the necessary budget/money is available. “We operate using money, nothing else...”

Theme 6: Ways to grow the construction industry through finances.

Informal contractors’ responses indicated that each member agreed to growth in the industry. However, based on general responses, it seems that informal contractors differ on the areas of finance and human resource risk factors. Members from group C agreed that the types of risk factors that impact the construction industry varies. A member from group C stated,

“Growth does not only depend on how much money is availed to the industry...rather the nature of human contributions toward the industry is vital ...what skills are required and how such skills are managed in the industry.”

Another experienced (for over 10 years industry experience) member from group A indicated:

*“We need all, **funds, equipment and materials** to contribute to growth” In disagreement, another member reiterated “bring the funds ...then see growth, high growth and the overall growth level in the construction industry”.*

Based on the responses of the participants it became clear that industry growth largely depends on multiple factors. This finding is contrary to a study by Wang and Lu (2004) that external risk factors influence not only project growth but also the continuity of the project.

Sub-theme 6.1: Growth indicators, control risk factors, better communication, high priority, financial risks.

From the responses gathered so far from informal contractors, it was clear that all the group members desire growth which can be possible through other factors namely communication, setting priorities and reduce existing financial impact.

“For industry growth, nothing must be left; all the growth factors such as funding, skills and setting key priorities to be taken serious....of course, at all

times, materials and equipment must be availableour health also” a member from group A stated. The finding is inline with recent study by Emuze (2011) that the construction industry needs multiple internal and external skills that can be applied to improve operations in the construction industry.

Another group member from C add.

“Don't forget how we the big bosses communicate project related issues are key”.

“Continuous review and feedback for project owners, suppliers and clients are usually slow or in most instances not availableto me, there is lack of clarification of information, lack of knowing what shareholders want. In otherwise, there is lack of enough and accurate communication...less communication ineffective and inadequate thus creating delays, misunderstanding and inhibit growthprioritization of communication is critical”. Stated by group member from group B.

Another senior member from group C expressed his views as follows:

“Communication between stakeholders, employees and project managers through the use of native language leads to better understanding and growthcommunication creates significant delays in project delivery, materials supplies and impact on project qualities once the understanding is inadequate or not as expected”.

The general concerns raised by informal contractors about communication challenges as one of the **internal risk factors** were well understood. This was because most participants in this study work for the construction industry. The issues of communication as a risk factor appears to be significant to project managers and owners. Informal contractors across the construction industry view communication as the primary source of project success since they are severely affected by issues of communication which are revealed through their responses above.

Sub-theme 6.2: The need to acquire materials at lower quality costs.

The general consensus regarding reached was that overwhelming majority agreed that through materials, the industry is likely to experience lower operational costs and heighten quality projects. It emerged that all the group members (groups A, B and C) agreed that the construction industry needs to increase the risk factor control measures. One member, however, stressed the need for quality control also.

“According to the member, quality control also relates to lowering operational and general costs need thinking about in this industry”.

Sub-theme 6.3: Risk factors to be controlled through training programs.

Many informal contractors who operate construction firms in the selected LMs stated that risk factors are not easy to assess in advance to enable effective control measures during operations when compared to other working environments. One member of group C stated.

“It was never okay to allow risks of any form to shut your operations down during operations. The biggest “mathatha” is we do not know where it comes from for our working clothes, we make sure we protect ourselves....risk during operations at times, very difficult to see, feel in advance ...in fact is like emergency or accident”.

Another member from group A remarked:

“these construction risk factors need education, knowledge and everyday training programs for us to see it (the risk) and stop it (the risk)....we still protect ourselves using the correct clothes, shoes and head protection equipment...the industry operators and bosses must help”

These extracts suggest that several firms lack specific plans and decision-making procedures that relates to risk reduction, mitigation as well as managing risks. It seems that both the qualified and junior informal contractors lack insights regarding the impact of risk management and reduction in general. The researcher noted this through some unclear statements and lack of specific responses to the questions about risk factors in the construction industry.

5.5 Conclusion

The gist of this chapter was to present the empirical evidence in the form of research outcomes based on the analysis. These outcomes were consistent with the questions on the risk factors influencing operations of informal contractors in the construction industry. The chapter started by identification of several risk factors which influence operations and activities of informal contractors. More specifically, the chapter outlined the impact and identified the risk factors of finance, design, project equipment, the internal and external environment of the industry. Besides, the chapter highlighted the likelihood of occurrence of management factors within the construction industry. In terms of gender, the findings showed that all the participants are men with adequate depth of experience in the construction industry. However, the working experience and educational knowledge of the informal contractors were found to be significant in identifying the risk factors and its impact on finance, design, and the external environment. With the aid of statistician, the chapter demonstrated key statistical findings through the analysis of variance (ANOVA) and the SPSS to test the null and alternate hypotheses. Earlier during the data analysis was based on demographic profiles of informal contractors who provided the raw data. One of the most significant results suggest that most of the informal contractors acquire some level of education. As such, the researcher assumed that all the informal contractors understood risk knowledge.

The qualitative study is designed to further explore the risk factors influencing informal contractors' operations. The thematic analytical tool was applied to make meaning from the raw data provided during the FGDs. Based on the general responses of informal contractors, the finding revealed the growing presence of different risk factors such as the design, financial, materials, equipment as well as labour (skills) in the construction industry. The findings indicated that informal contractors are faced with constraints requiring better management to enable the construction industry to play an important role in the informal economy. Besides, the findings showed that most informal contractors viewed the financial and material risk factors to be the most influential on operations in the construction industry. Though the findings also mentioned design and other external risk factors including prices and the weather conditions as crucial risk factors to be considered during operations, it emerged that the bulk of informal contractors need skills to manage and control the impact of risk factors in the industry. The findings emphasized the crucial role of acquiring construction skills play in the industry during operations. It is hope that the findings that are linked to the risk factors would serve as

useful guidelines in the development of specific framework and other invention measures aimed at assisting informal contractors in the construction industry.

CHAPTER SIX

SUMMARY OF THE STUDY, RECOMMENDATIONS AND CONCLUSION

6.1 Introduction

The general summary of this qualitative and quantitative findings of this study are outlined in this chapter. The chapter also suggests recommendations for the construction industry in informal economy. Besides, the next research path is highlighted followed by the research limitations.

The findings of this study make enormous contributions to the present body of scientific knowledge in the construction industry regarding the impact of risk factors. The analysis of qualitative and quantitative data through different analytical methodologies have identified the risk factors that impact the industry. This includes the impact of major financial, economic, and political risk factors in the construction industry. In addition, the chapter considered risk management practices and processes as well as the strategies to improve operations in the industry were considered.

The outcomes of this empirical study including the identification of risk factors demonstrate the similarities of risk factors in reducing several of the construction risks that were revealed through surveys by previous researchers (Khodeir & Mohamed, 2015; Musa et al., 2015). Past empirical outcomes further complicate practical applications of any form of findings that allows for the development of appropriate recommendations to various stakeholders in the construction industry and other governing bodies. This is due to the inability of researchers to agree to the identification and defining of risk factors within the construction industry (Motaleb & Kishk, 2015; Renuka et al., 2014). Besides, there has been lack of analytical approaches that provide guidance to identifying various similarities of risk factors and their linkages to different risk constructs in the industry (DiStefano et al., 2009; Yong & Pearce, 2013).

This study contributed to curbing the challenges by identifying the risk factors that impact the construction industry in the informal economy. The study identified a significant number of risk factors that impede project operations through qualitative and quantitative approaches.

Over the years, past study tried to utilize other approaches as primary tools to apply in conducting risk identification within the construction industry and their impact on operations (Chandra, 2015; Eybpoosh et al., 2011; Low et al., 2015; Sambasivan et al., 2017). Yet not much was achieved to identify construction risk in the industry that operates in informal economy (El-Sayegh, 2016; Ling et al., 2012; Juaidi et al., 2016). Given these outcomes, the present study highlights the significance of the benefits of this present study to close the knowledge vacuum in identifying risk factors in the construction industry across the informal economy.

Combining the outcomes of both quantitative and qualitative data will improve and enhance the closing of future and existing knowledge vacuum of the risk factors identification and its impact on project operations by informal contractors in the construction industry. The next section reports the findings of this thesis.

6.2 Summary of empirical study

An empirical study was conducted by gathering primary and secondary data through qualitative and quantitative methods. Primary data was collected using 304 informal contractors from eight LMs for quantitative data while 18 informal contractors of 3 groups (groups A, B and C) each consisting of six informal contractors. Based on the theoretical and conceptual chapters (2 and 3), the results and interpretations were presented in chapter 5 to demonstrate the impact of risk factors on the construction industry. From the literature chapters it was eminent that the construction industry is highly marred with several risk factors that impact differently on the construction industry. These phases include the project design, financial, materials and decision-making process during project operations.

6.3 OVERALL CONCLUSION OF THIS EMPIRICAL STUDY

This empirical study aims to develop IRFIF to enhance operations of informal contractors in the construction industry in the informal economy. Risk factors identifications to determine the rates of occurrence during operations make it possible to utilize the IRFIF that can easily increase operational success rates in the construction industry. The development of IRFIF was motivated by many risk factors as part of the responses from informal contractors. These include the financial, external, project design and internal risk factors as discussed. Other constraints

namely poor level of performance, project delays, high costs of materials and customer dissatisfaction influence operations in the construction industry (Saidu & Shakantu, 2017; Enshassi et al, 2017). These constraints impede most operations of the construction industry in informal economies; thus, each of these are unable to sustain operations of the construction industry. The chapter also outlines the study’s objectives and the questions that were posed to informal contractors qualitatively during FGDs and in a quantitative format for answers. Table 6.1 below restates the objectives and the questions that guide this study.

Table 6.1: Research objectives and questions

Research Objectives	Research Questions
<ul style="list-style-type: none"> To establish the risk factors of informal contractors in the construction industry in the FSP. 	<ul style="list-style-type: none"> What are the risk factors of informal contractors?
<ul style="list-style-type: none"> To examine the nature of risk factors in the construction industry in the FSP. 	<ul style="list-style-type: none"> What is the nature of risk factors in the constructions industry?
<ul style="list-style-type: none"> To identify the significance of the sources of risk factors in the construction industry in the FSP. 	<ul style="list-style-type: none"> What are the significance sources of risk factors in the construction industry?
<ul style="list-style-type: none"> To evaluate the types of risk factors that impede operations of informal contractors. 	<ul style="list-style-type: none"> What type of risk factors impede operations of informal contractors?
<ul style="list-style-type: none"> To develop an Integrated Risk Factor Identification framework (IRFIF) to enhance operations of informal contractors. 	<ul style="list-style-type: none"> What is the Integrated Risk Factor Identification framework (IRFIF) that could enhance operations of informal contractors?

Source: Design for the study

Chapter 2 this chapter detailed the relevant theoretical perspectives of informal economy through the clarifications of key leading theories. These theories include the dualist, the structuralists views and the voluntarists theory. Besides the theories, the chapter illustrates specific information of the dualist model that further describes the formal and informal economy as described by Willson (2011) and Devey (2003). While the dualist and structuralists

views depict the primary linkages between the formal and informal economies, the legalists views focus on regulatory processes of informal economic activities (Chen, 2012). However, other scientists perceived informal economic activities to focus on tax avoidance measures and lack of compliance with State regulatory framework (Perry et al, 2007). According to Bhorat et al, (2016), there are vast volumes of opportunities to earn higher income through jobs and other tax invasion measures entering the informal sector of the economy. This implies that the theory of voluntarists has significant bearings on entrepreneurial activities that dominate the informal economy where taxation and State regulatory measures are critical for economic survival of firms in specific industry. The chapter further highlights the historical background of informal economy. Lastly, the chapter outlines the linkages between the formal and informal economy (refer to figure 2.2). While it is acknowledged that the two economic activities are related and cannot be separated, the formal economy derives several forms of state support through regulatory framework and other benefits than the informal economy. According to Neves and Du Toit (2012), the relationships between the formal and informal economy involves trading activities that do not involve traditionally produced herbal medications. However, the informal economy is documented to supply diverse products, materials, and services to the formal economy in the retail and manufacturing sectors. The loss of income from informal trading activities creates an adverse impact on trading income and the general economic operations across the formal economy.

Chapter 3: the chapter depicts the theoretical and conceptual framework of the risk factors in the construction industry that operates in informal economy. The central idea was to uncover the risk factors that impact on operations within the construction industry. Risk factors were explored and identified throughout the industry to assess the degree of impact within the informal economy as the risk factors are analysed (Chatterjee et al, 2018). Historically, the concept of risk emerged from France as any event that results from negatives outcomes. The two different dimensions such as the probability that risk will occur or multiple events that occurs with the support of specific outcomes. The nature of risks entails any likelihood event that is not known due to their different levels of occurrences (Steyn et al, 2012; Barber, 2005). The chapter continues to elaborate on different risks or uncertainties of events and the likelihood of such events occurring further explains the positive or negative effects on specific industry's operations. According to Berg (2010) and Duong (2013), risk is the "uncertainty of events". However, the concept is further summarized as challenges of exposure that is frequent or unknown event (ISO, 2009).

The chapter is further extended to include several risk factors that impact operations in the construction industry. These include the financial, technical, economic, physical, political, and environmental risks. These risks have been defined by several authors and academics to significantly impact on project operations and performance thus, causing severe impact on the overall operations of projects in the construction industry thus creating deepening financial losses to informal contractors in term of market share and client base (Mbande 2010; Wong & Cheung, 2005). Financial distress as a risk factor is known to have created significant impact on the depth of project performance among contractors that operates in unfavorable working climate thus leading to the closures of many firms in the construction industry (Ibrahim et al, 2012; Dada & Jagboro, 2007). Other technical risk factors namely accidents, collision, design failures, equipment and contractor skills are some of the contributory factors to the negative effects on project operations and performances due to managerial difficulties (Vidivilli, 2016; Xu et al, 2010; Manelele & Muya, 2018).

Lastly the chapter described project risk management after the risk factors have been identified to ensure successful operations (Asadi, 2015; Ansah & Sorooshian, 2017). Project risk management entails various risk documentation as well as supportive tools that are applied to manage risk in the construction industry (Elmhedwi & Elmabrouk, 2015). Risk register is one of the primary checklist documents that are used during the planning and interview phases (PWC, 2017). It is vital that project managers identify the project risks properly since any form of ineffective risk identification process is likely to reveal adverse project findings in the form of cost overruns, project delivery delays and poor project quality. Risk identification according to empirical reports can be through the qualitative and quantitative approaches based on the type of project and the availability of information (Firmenich, 2017; Taroun, 2014).

Chapter four outlined the applicable methodology the researcher used to gather primary data and how the final dataset was analysed. To ensure that the mixed method approach was used during the analysis stages, the SPSS statistical tool was applied to analyse quantitative data. The SPSS tool was aided by the descriptive and inferential statistical format was used to conduct the quantitative data while the thematic tool was utilised to make meaning of the qualitative data. Purposive sampling technique was used to select informal contractors to participate in the study from 18 rural LMs. The chapter finally discussed other statistical tools used to test formulated hypotheses. Specifically, the Analysis of Variance (ANOVA) was applied to test

the significant effect of the dependent and independent variables. Through the thematic analytical tools, related themes and sub-themes that emerged from the qualitative data were discussed.

Chapter five this chapter detailed the results and interpretations of the study. The rate of response was 71.6% while the Cronbach alpha was applied to determine the reliability of the quantitative research instrument. Based on the quantitative research instrument section A of the questionnaire entails biographical data provided by informal contractors. The section revealed that most participants were educated and knowledgeable to analyse and identify risk factors that impact project operations in the construction industry. The section further outlined that the majority (69.7%) of informal contractors acquired industry experience that span from 5 to 10 years in the construction industry. The majority (78.6%) of the informal contractors in the study were owner-contractors who operate in the industry. Besides, the majority (67.1%) of the industry operated by men; 59.1% of the owner-contractors were in their youth between the age group of 20 and 25 years. Regarding business registration, 73% of the firms in the construction sector were registered. The next section discussed the frequency distributions of different risk factors and their impact on project operations in the construction industry. Frequency distributions revealed that the different risk factors impact significantly on operations; thus, affecting the informal contractors. However, some of the risk factors impact moderately on project operations. These revelations through frequency distributions agreed with the formulated hypotheses that involved risk factors of management, design, finance, material, project equipment, labour and the external environment. All the null hypotheses were not rejected except the project risk factors.

Chapter six focuses on the summary of the study, recommendations and conclusion. This empirical study ends with the provisioning of detailed synopsis involved in the study with the outcomes based on set objectives. To ensure all the findings were outlined, this chapter presented the questions and objectives that were applied throughout the study. The key sections of chapter six present in-depth descriptions of different contributors to scientific knowledge, recommendations to informal contractors as well as to other role players within the construction industry. These include rural policy makers, districts and local municipal managers of the FSP. Lastly, the implications and further suggestions for future empirical study were highlighted.

6.4 KEY FINDINGS OF THE THESIS.

6.4.1 Major quantitative outcomes

The major quantitative outcomes of this study are outlined as follows:

- **Demographic findings of the study.**

The study found that 78.6% of the construction industry is owned by contractor employees. Most of the construction firms in the LMs are owned by male contractors; only 32.9% of the industry are owned by female contractors. Many informal contractors achieved their vocational qualifications, however, only 19.6% of informal contractors were unable to receive formal education. According to a survey report, the construction industry in the LMs is largely owned and operated by 59.1% contractors between the age group ranging from 20 and 25 years. This is followed by 36.4% of contractors in the age group between 50 to 60 years old. The result that emerged from the analysis demonstrates that the construction industry across the eight LMs where the study was conducted is operated by youthful contractors. The report further revealed most of the informal contractors had many years of experience in the construction industry.

- **Summary of frequency distributions**

This section provides summaries of the frequency distribution results on different phases as indicated in the questionnaire.

Regarding decision-making procedures as a risk factor, the result revealed that a high proportion of informal contractors mentioned that decision-making procedures has significant impact on the industry. Similarly, the *internal risk factors* such as risk factor of communication with stakeholders in the industry has moderate impact while the highest proportion (31.3%) of informal contractors stated that “*the presence of representatives*” has moderate impact on industry operations. Another risk factors the *internal risk factors* of “*sharing information*” impacts extensively on operations in the construction industry.

Based on the analyses, informal contractors stated that the statement “contracting experience” has significant and extensive impact on industry activities. Further revelation on the risk factors of “*experience in design tasks*” and “*design nature unclear (project risk factors)*” impact extensively on the industry while “*unclear drawing of projects*” is identified to have moderate impact on the construction industry.

Additional risk factor of “*information gathering before design*” and “unclear drawings of projects” are likely to occur. Regarding the risk factor “completed work paid for”, “funding project levels of cash flow analysis” and “estimate of cost accuracy as a risk factor of finance” showed a moderate impacting risk factor on industry operations.

6.4.2 Major qualitative outcomes.

The key qualitative outcomes that emerged from this empirical study were the *financial risk factors* (contractors’ funding issues and cash flow analysis). Others include the *external risk factors* (weather conditions, storm, rain and harsh weather climate, economic and social), *project design risk factors* (unclear project design and documentations, modification of documents, nature of project risk and information). The *internal risk factors* (communities, site acquisition, documentation and information). These factors were outlined below based on the responses from eighteen informal contractors that were selected from different LMs and divided into three groups (A, B and C) with each group consisting of six informal contractors. The outcomes of the qualitative analysis in chapter 5 were identified as some of the major risk factors that continue to adversely influence the construction industry and operations of informal contractors.

- The skills needed of the industry is critical for the success of the industry. However, most informal contractors are equipped with very low or no skills; as such most of the informal contractors primarily relied on industry experiences. This serves as a potential risk factor for the industry. More funding is required for investment in skill programs.
- The construction industry needs “*hands on approach*” for industry operations and development. The industry operates multi-task activities as more skillful contractors are required to produce quality projects; contractors in the industry need to be practical and to demonstrate handy skills (*Theme 1.1*).

- Industry experience provides better and quality projects and lasting housing infrastructure (*Theme 2*).
- Inexperienced contractors increase material costs amounting to high expenses through wastage and spoilage of materials (*Theme 2*).
- The bulk of external risk factors are unstoppable during project operations; lack of notification before external risks occurs (*sub-theme 2.1*).
- Complex nature of the industry, low skilled workforce with little risk factor of knowledge and difficulties to perform project related activities (*Theme 3.1; 3.2*).
- The volume of external and internal risk factors that impact operations are significantly large (*Theme 2.2*).
- The impact of risk factors is well acknowledged as expressed by informal contractors (*Theme 3*).
- Informal contractors displayed a high level of risk factor knowledge as project knowledge is linked to productivity and sustainability of the industry (*Theme 3.2*).
- The complexity of the construction industry; prioritization of construction risk is very significant to successful project operations (*Sub-theme 3.2*).
- Risk in the construction industry requires assistance and applications of risk management strategies in the industry (*Theme 4*).
- The processes and procedures of risk management are seldom practiced in the industry (*Sub-theme 4.1*).
- The processes and procedures are followed at personal levels for protecting oneself against risks by using protective clothes at work (*Sub-themes 4.2*).
- Risk management is scarcely applied in the industry (*sub-theme 4.3*).

It is notable that during the FGDs the informal contractors indicated that most significant risk factors of ***project risks factors. Internal and external risk factors, financial project design risk factors*** are some of the critical challenges to the construction industry. These findings are supported by scholars such as Ali and Kamaruzzaman (2010), Bodicha (2015) and Vaardini (2015). Further qualitative and quantitative

Other findings emerged based on both the qualitative and quantitative analyses. More particularly, given the nature of both study designs, the outcomes stated in sections 6.2.1 and 6.2.2 are further outlined in line with the research questions that were posed. The research

questions below were posed to informal contractors through the questionnaire and interview schedule for answers to achieve the study objectives. Below are the quantitative and qualitative questions that were posed to informal contractors.

- What are the risk factors of informal contractors in the construction industry in the FSP?

In section 6.2.1, key risk factors of “decision-making procedures, communication with stakeholders in the industry, was identified to impact significantly on the operations of informal contractors, sharing information, contracting experience, experience in design tasks and design nature unclear”. These risk factors had a significant impact on the operations of informal contractors in the construction industry. More specifically, decision-making procedures were identified to have significant impact. It emerged that the risk factor “communication with stakeholders in the industry” has moderate impact on project information. However, the risk factor of “the presence of representatives has moderate impact on informal contractors’ operations in the industry.

The study identified the risk factor of “*contracting experience*” that impacts the overall project operations of informal contractors. This risk factor was identified and assessed to be significant based on the frequency levels indicated and ranked to be the dominant risk factors that impact significantly on operations of the construction industry.

- What is the nature of risk factors in the construction industry in the FSP?

Question 2 was answered through an extensive and detailed literature review process based on previous empirical studies especially in informal economy across developing countries. According to extant literature, the nature, and the degree of risk factors in the construction industry can be managed by the theory of contingency. Based on the theory, the construction industry is very complex; as such, every project is associated with different risk factors that demand quick and urgent processes to curb possible negative impact on project operations within the industry. The theory is therefore linked to the unique thinking ability of construction project environment with the aim to identify risks through strategies. Besides, the nature of risks are the critical elements that impact the different project phases being it financial risk factor or the risk factor of project time of execution. This question was further answered during FGDs.

One group member indicated “project has specific nature of risk”. This implies that project risks are unique yet very diverse in the construction industry with severe impact if left unnoticed and not managed.

- What are the significant sources of risk factors in the construction industry in the FSP?

Based on literature, there are no similarities of project risks. Project risks emerge through the internal or external environment of the construction industry. While internal sources are controllable, external sources cannot be controlled by stakeholders. These sources according to literature are very significant as they could impact negatively or otherwise on project operations thus affecting project qualities.

Further, the sources of risk factors in the construction industry include general handling of government regulations due to democratic principles. Accordingly, risk factors within the construction industry need proper management control systems to achieve the desired objectives. The sources of project risks therefore include opportunity risks, uncertainty, and hazard-based risks (refer to section 3.7.2). While the opportunity risks create the likelihood for growth possibilities in the construction industry, opportunity risk is acknowledged to impact significantly on project operations. Opportunity risk occurs due to climatic conditions that are linked to the concept of “uncertainties”, hazard-based risks are potential risks that creates significant impact on operations in the construction industry through several sources including human errors. The opportunity risks according to literature, need continuous management procedures, proper control, and early warning systems (EWSs) in the form of innovations through technology.

- What type of risk factors impede operations of informal contractors in the FSP?

Based on qualitative and quantitative data analysis, specific risk factors have emerged as critical impediments to project operations in the construction industry. The risk factors of “the presence of representatives” is one of the impediments of project operations in the construction industry. Contracting experience as one of the risk factors that emerged from the findings has no significant impact on operations within the construction industry while the risk factor of “competency as a contractor” has extensive impact on informal contractors’ operations. Furthermore, the risk factor “conflict resolution” impedes moderately on project operations thus

affecting the entire project life cycle in the industry. Other risk factors namely “unclear drawings of project”, experience in design tasks, and the level of cash flow analysis has moderate to extensive impediments on the general operations of informal contractors in the construction industry.

6.4.3 Conclusions relative to the research hypotheses

H1_N: The level of likelihood of management risk factors has no significant effect on the impact of management related risk factors.

The descriptive statistical analysis revealed several risk factors such as management, project design, financial, material, project equipment, labour, and external environment risk factors that impact significantly on project operations. ANOVA was conducted to test formulated hypothesis to determine the level of impact. ANOVA result indicated that the null hypothesis (***H1_N***) was not rejected. Therefore, the assumption that states “There is no statistically significant difference at the level of 5% of significance on the impact of management risk factors scores” [F (2.301) =0.691, p=0.502]. The implication is that the null hypothesis could not be rejected.

H2_N: The level of likelihood of project design risk factors has no significant effect on the impact of project design risk factors.

The descriptive statistical analysis revealed several risk factors of project design risk factors impact significantly on project designs during operations. ANOVA was conducted to test formulated hypothesis to determine the level of impact. ANOVA result indicated that the null hypothesis (***H2_N***) was not rejected. Therefore, the assumption that states “There is no statistically significant difference at the level of 5% of significant impact on project design scores” [F (2.301) =1.085, p=0.339]. The implication is that the null hypothesis could not be rejected.

H3_N: The level of likelihood of financial risk factors has no significant effect on the impact of financial risk factors.

The descriptive statistical analysis revealed several risk factors of financial risk factors impact significantly on project operations. ANOVA was conducted to test formulated hypothesis to determine the level of impact. ANOVA result indicated that the null hypothesis (***H3_N***) was not rejected. Therefore, the assumption that states “There is no statistically significant difference at the level of 5% of significant impact on financial risk factors scores” [F (2.301) =1.263, p=0.284]. The implication is that the null hypothesis could not be rejected.

H4_N: The level of the likelihood of material risk factors has no significant effect on the impact of material related risk factors.

The descriptive statistical analysis revealed several risk factors of material risk factors impact significantly on material related risk factors during operations. ANOVA was conducted to test formulated hypotheses to determine the level of impact. ANOVA result indicated that the null hypothesis (***H4_N***) was not rejected. Therefore, the assumption that states “There is no statistically significant difference at the level of 5% of significant impact of material related risk factor scores” [F (2.301) =0.210, p=0.810]. The implication is that the null hypothesis could not be rejected.

H5_N: The level of the likelihood of project equipment risk factors has no significant effect on the impact of project equipment related risk factors.

The descriptive statistical analysis revealed several risk factors of project equipment risk factors impact significantly on project equipment related risk factors during operations. ANOVA was conducted to test formulated hypotheses to determine the level of impact. ANOVA result indicated that the null hypothesis (***H5_N***) was rejected. Therefore, the assumption that states “There is no statistically significant difference at the level of 5% of significant impact of project related risk factor scores” [F (2.301) =11.790, p=0.000]. The implication is that the null hypothesis could be rejected.

H6_N: The level of the likelihood of labour risk factors has no significant effect on the impact of labour related risk factors.

The descriptive statistical analysis revealed several risk factors of labour risk factors impact significantly on labour related risk factors during operations. ANOVA was conducted to test formulated hypotheses to determine the level of impact. ANOVA result indicated that the null hypothesis (**H6_N**) could not be rejected. Therefore, the assumption that states “There is no statistically significant difference at the level of 5% of significant impact of labour related risk factor scores” [F (2.301) =2.185, p=0.114]. The implication is that the null hypothesis could not be rejected.

H7_N: The level of the likelihood of external environment risk factors has no significant effect on the impact of external environment related risk factors.

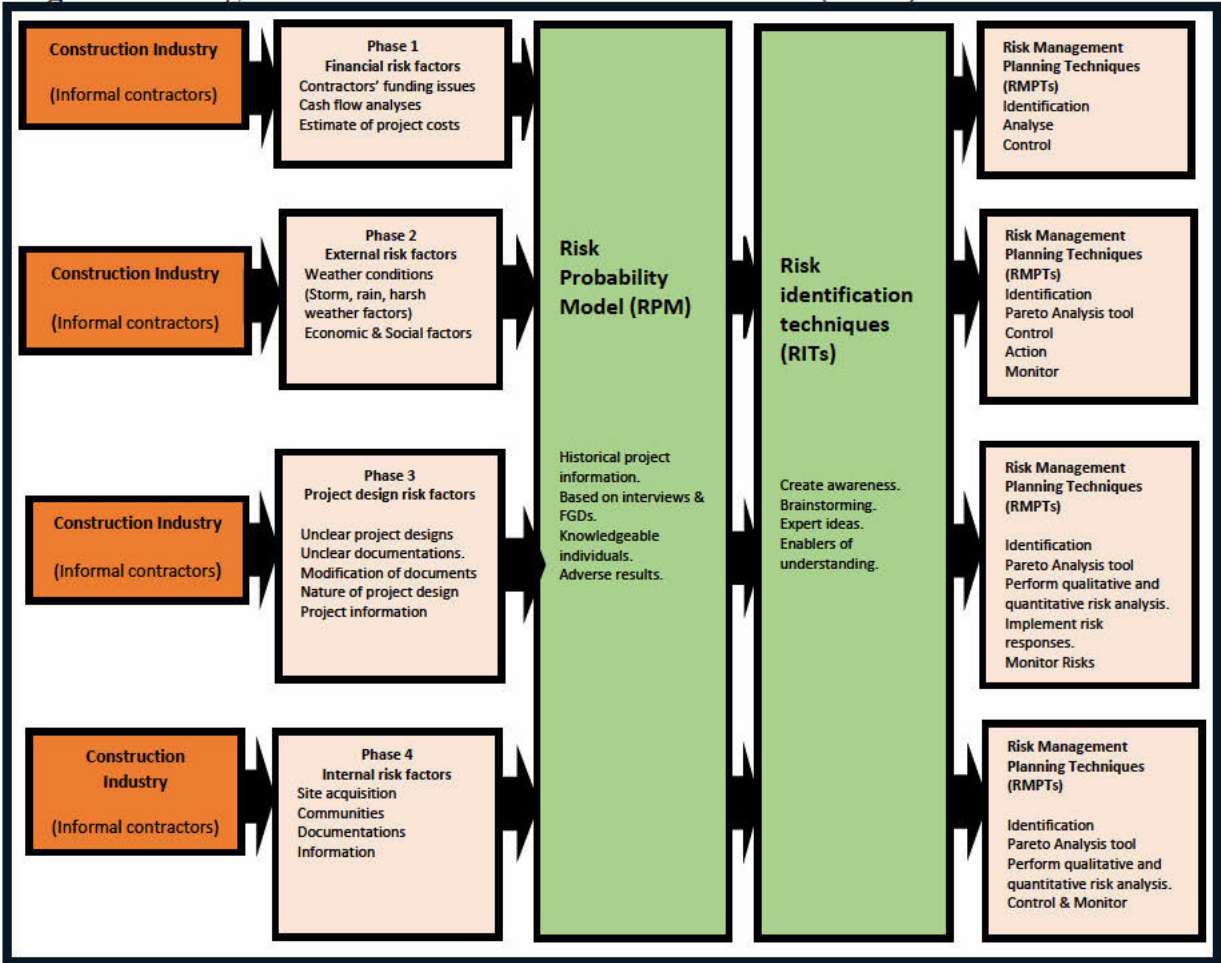
The descriptive statistical analysis revealed several risk factors of external environment risk factors impact significantly on external environment related risk factors during operations. Anova was conducted to test formulated hypotheses to determine the level of impact. Anova result indicated that the null hypothesis (**H7_N**) could not be rejected. Therefore, the assumption that states “There is no statistically significant difference at the level of 5% of significant impact of labour related risk factor scores” [F (2.301) =1.710, p=0.1837]. The implication is that the null hypothesis could not be rejected.

6.4.4 Developing an integrated risk factor identification framework (IRFIF) to enhance operations in the construction industry.

This study aims to explore the risk factors influencing informal contractors’ operations in the construction industry in selected local municipalities in the FSP of South Africa. The integrated framework is informed by the key constructs of **internal and external, financial, project design risk factors** based on the qualitative findings as shown in section 6.4.2. Throughout this empirical study the study managed to identify and establish the extent to which risk factors influence operations of informal contractors in the construction industry. Based on literature and primary data collected, several risk factors were identified and discussed. These include **financial, internal and external** and **project design** risk factors to have significant influence on project quality and delivery. Besides, all projects are confronted with several risk factors

such as skilled labour, materials, expert designers, finance, equipment, and all internal and external environments of operations to produce quality projects. It emerged from the findings that any form of inefficient and lack of effective identification of risk factors could result in negative findings and subsequent impact on the project quality. Through extant literature, much is written about the complexity of the construction industry; due to its complex nature of operations, it is pivotal that the stakeholders in the industry practice ongoing risk identification processes to enable strict measures of risk management processes to reduce the rampant effect of risk factors on project operations. Given the discussions on the final conclusions, earlier in the study as well as the study outcomes, a proposed integrated risk factors identification framework (IRFIF) is developed to (refer to figure 6.1 on the following page) enhance the risk factors identification processes in the form of early detection measures in the construction industry.

Figure 6.1: Integrated Risk Factors Identification Framework (IRFIF).



Source: Researcher's own design.

Given the complex nature of the construction industry as described throughout this empirical study, the researcher suggests the application of the IRFIF to assist in decreasing the significant impact of key risk factors. The subsequent impact of the risk factors on operations of informal contractors in the construction industry can be curtailed through the various phases as indicated above. Figure 6.1 above depicts the four different phases that include the financial, external, the project design and the internal risk factors of the IRFIF. The IRFIF consists of the key risk factors that serve to create severe impediments within the construction industry and the general operations of the informal contractors. Based on the research findings, some of the risk factors are known to create significant higher impact on project operations based on their level of occurrences (refer to tables 5.11 and 5.13) while others are rated to have moderate impact on the industry's operations.

However, considering the elements of the tables mentioned above, the levels of occurrences and subsequent impact varies in terms of financial risk factors (phase 1) that revealed severe impact on industry's operations. The financial risks include industry risks such as the risks relating to contractors' funding difficulties, cash flow constraints, the estimates of project costs and cost overruns. The intensity of financial risk factors' impact demands an early identification processes and immediate application of efficient risk management planning techniques that are based on various elements of risk probability model (RPM). The RPM is one of the risk tools that enables project managers of industry stakeholders to utilize project historical information from qualitative tools such as FGDs and interviews for risk identification. Application risk identification techniques across different phases of the IRFIF entails the creation of public awareness campaigns, provisioning of expert ideas, brainstorming and understanding specific nature of industry risk factors.

To ensure that **Phase 1** of the risk factors (especially the financial) are curtailed, risk management planning techniques (RMPTs) to identify, analyse and control to become ongoing events in the industry. The holistic and comprehensive application of the RMPTs is likely to curtail the risk factors impact on operations at the level of awareness especially among employees increase. Further, the findings that most employees are knowledgeable of the risk factors and have achieved the minimum education could enhance early risk factors detection in the industry.

Phase 2 of the IRFIF comprises the external risk factors such as the weather conditions (storm and rain damage and harsher environmental factors, economic and socio-political factors). With the construction environment, external risk factors are known to occur at random with the least notice. These risk factors could cause considerable impact on project operations in the industry; thus, rendering the industry unsustainable and failure. The IRFIF suggests an approach that uses RPM for historical project information on the external risk factors that may be based on either interview or the FGDs. Thereafter, all the risk factors could be identified as industry awareness, brainstorming procedures, and seeking expert ideas as well as understanding the risk factors. A better structure of IRFIF as depicted in figure 6.1 illustrates the levels risk factors' impact on industry operations and sustainability. Similarly, other risk factors including external risk factors especially harsh weather conditions severely impact and cause significant disruptions to projects in the industry. Disruptions through weather patterns are frequent occurrences that cause deeper financial losses to informal contractors.

Phase 3 of the IRFIF is composed of several risk factors including project design risk factors. The project risk factors were unclear project designs, unclear documentations, modification of documents, nature of project design and information. The next step in the risk factors management processes is to utilize the historical project information to understand the risk factors within the industry. Also, the risk factors can be accessed through other qualitative tools such as the interview processes and FGDs based on responses of stakeholders that participate in the processes. Once the RPM is used to establish enough knowledge regarding the risk factors, techniques of risk identifications (RITs) need to be applied.

The RITs is a structural procedure that involves creating employees' awareness. Other procedures of RITs include the brainstorming stages to enable industry management to better understand the impact of specific project design risk factors of the industry. Expert ideas as another procedure of the RITs enables positive identification of risk factors to establish risk management planning techniques (RMPTs). At the planning stages, the stakeholders can use techniques such as the Pareto analytical tool, the qualitative and quantitative risk analysis implementation of risk responses and processes of risk monitoring. Both the qualitative and quantitative analysis entails specific techniques that are used for insights into the financial aspects of project risks. The quantitative risk management techniques use the values of numerical nature to ascertain the probability of events and their potential organizational impact. On the other hand, the qualitative risk analytical tool focuses on the risk impact that employs

non-numerical tools. The quantitative risk analytical tool is driven mainly by data to mitigate losses in the industry.

Finally, regarding **Phase 4** of the IRFIF, the construction industry shall re-consider its ability to identify the risk factors that impact every project operation and the tasks of informal contractors. The dearth of risk factors impact can be reversed through the applications of the RPM procedures as well as the utilization of RITs of the IRFIF values. Phase 4 of the model (IRFIF) consists of the internal risk factors such as site acquisition, communities, documentation as well as the relevant information. To further ensure that the risk factors are reduced, proper risk factor identifications, creation of awareness among employees and planning is critical in an industry that is known to be complex. The risk probability model (RPM) provides historical project information through qualitative tools of interviews and FGDs processes. The next process entails the application of the RITs such as the employee's awareness, the processes of brainstorming and the application of expert ideas that lead to the final processes of risk factor identification, Pareto analytical tool, perform qualitative and quantitative risk analysis thus reducing the risk factor impact.

As revealed through extensive literature, the impact of risk factors can only be minimized through a combination of various techniques and models that are tested to be effective in reducing the risk factors. Figure 7.7 provides enough descriptions of risk factors as well as at every level of the planning mechanisms that would assist in decreasing risk factors in the construction industry. Adopting the IRFIF as explained in table 7.7 by stakeholders in the construction industry will create positive support for the industry to produce quality projects at lesser costs as scheduled, increase competitiveness of informal contractors and to become sustainable.

6.4.5 The strengths, limitations, and impediments of the empirical study.

According to Mavodza (2010), a higher rate of empirical study response further enhances reliability as well as validating the study outcomes. Through triangulation of data, this study was strengthened by achieving credible research outcomes that offset possible weaknesses of the quantitative and qualitative approaches, thus providing stronger and reliable scientific inferences (De Vos, Delpont, Fouche & Strydom, 2011). Through the triangulation approach,

there was a reduced level of bias and improvement in research quality, weaknesses were curtailed for each of the methods applied (Fidel, 2008; Bless et al, 2013).

Every academic task is marred by limitations (Hofstee, 2006). One of the outstanding limitations of this study was the difficulties to reach the research population. The researcher intended to use nine LMs in the FSP; however, only eight LMs were permitted to participate in the study to provide primary data. During the data gathering processes, the researcher continued to experience negative attitudes from individual informal contractors as well as late responses to questionnaires many of which were completed wrongly and finally discarded. Other participants' attitudes that jeopardize this study include behavioural changes by the participants in the midst of the study. Another significant limitation was time and financial constraints as the researcher was under pressure to complete the study within a given timeframe.

The research was limited to gathering data due to minimum sample size, and to gain access and approval from municipal authorities. In most instances, municipal managers were not available to sign the permission and approval letters. FGDs interviews were postponed more than five times because of the non-availability of some informal contractors who were out of the LMs for construction works for weeks. These postponements were very costly to the researcher as the LMs were geographically dispersed across the province.

6.4.6 Recommendations to the districts and local authorities

- There is the need to expand funding opportunities from the formal to informal economy to enable informal contractors to reduce the impact of all forms of risk factors on the construction industry.
- Provide an inclusive legislative framework to allow informal contractors to have access to different construction materials. This approach is largely used in other developing countries at local government levels to level the competitive landscape of the industry and to reduce the impact not only across the industry but to also enable the industry to become risk efficient and to practice flexible resource allocation within the construction industry.
- Stakeholders in the construction industry should implement compulsory and comprehensive risk factor management in the construction industry.

- There should be more focus on reducing internal risk factors through the creating employees risk awareness programmes to be spearheaded by the project team managers.
- More attention to be paid to all financial risk factors under the project managers' control. Financial risk factors such as the cash flow analysis, communication issues between the stakeholders and employees.
- Establish an efficient system to facilitate early payment and for more industry funding operations to reduce cost overruns because of inflationary measures.

6.4.7 Contributions of the study

This study represents an enormous contribution to scientific knowledge and provides significant insights into the construction industry in informal economy. It outlines the various risk factors that impact the industry and its operations; thus, creating the opportunities at districts and local municipal levels to formulate policy framework that to enhance the industry's growth by decreasing the nature of risks.

6.4.8 Recommendation for future empirical study.

Based on the theoretical underpinning, more empirical study should focus only on quantitative research to examine the various risk factors to determine the significant impact of each risk factor. Besides, the study should also determine which risk factor contribute more to the failure of the construction industry. The future empirical study should make the determination regarding the statistical tool that could assist in early detection and identification of the risk factors in the construction industry of informal economy. In addition, empirical study in the future should stress the development of a risk probability model (RPM) that predicts risk occurrence events during project life cycle.

The RPM may be assumed to be utilised as a vital technique for managing project operations, aiding the project team daily tasks. Through the adoption of the RPM other project stakeholders could determine which of the risk factors most impact the occurrence of risk events during the project design phase. The present empirical study was conducted in the informal settings that consisted of eight LMs of the FSP of South Africa; therefore, the researcher suggests that

empirical study in the future need to focus by extending the data collection processes to include the entire LMs of the province. Participants bias during the data gathering processes indicating that all were owner-managers of the construction industry needs further probing in the future. This is crucial to conduct an evaluation of contractual and external risk factors to provide suggestions about the risk factors to the local municipal authorities.

6.4.9 Conclusion

This chapter aims to detail out the summary and the conclusions that emerged from the outcomes. Besides, the chapter is structured to make recommendations. All the objectives stated in chapter one was achieved and outlined based on the final outcomes. The overall conclusions of this chapter indicates that risk factors in the construction impact operations of projects in the construction industry. The risk factors according to literature and from the primary data have significant impact on operations; thus, resulting to creating negative project operations, severe delays, and high material costs to the industry. Nonetheless, the impact of risk factors on the construction industry as indicated in the literature chapters. Based on the study outcomes and the objectives, it has become necessary to suggest a framework based primarily on responses of informal contractors in respective groups that can assist the construction industry through the identification and decreasing the risk factors.

REFERENCES

- Abassi, G. Y., Abdel-Jaber, M. S. and Abu-Khjedart, A. (2005). Risk analysis for the major factors affecting the construction industry in Jordan, Emirate, *Journal of Engineering Research*, 10: 41-47.
- Adeleke, A. Q., Bahaudin, A. Y. and Kamaruddeen, A. M (2019). Preliminary analysis on organizational factors influencing effective construction risk management: A case study of Nigerian construction companies. *Sains Humanika*, 8 (2), 1–7.
- Adler, E. S. and Clark, R. (2011). *An Invitation to Social Research: How It's Done* (4th ed.). Wadsworth.
- Aimable, S. (2015). Effects of risk management methods on project performance in Rwandan construction industry: A case study of the multi-storey buildings construction project of RSSB. Master's thesis, University of Agriculture and Technology (Kigali Campus), Rwanda.
- Al-Ajmi, H. F., and Makinde, E. (2018). Risk Management in Construction Projects. *Journal of Advanced Management Science* Vol, 6(2).
- Akanni, P. O., Oke, A. E. and Akpomimie, O. A. (2015). Impact of environmental factors on building project performance in Delta State, Nigeria. *HBRC Journal*, 11(1), 91-97. doi:10.1016/j.hbrcj.2014.02.010
- Akiner, I. M. and Akiner, E. (2009) Evaluation of Turkish Construction Industry through the Challenges and Globalization. *Organization, Technology and Management in Construction an International Journal*, 1, 64-71.
- Akintoye, A. S., and MacLeod, M. J. (1997). Risk analysis and management in construction. *International Journal of project management*, 15(1), 31-38. [https://doi.org/10.1016/S0263-7863\(96\)00035-X](https://doi.org/10.1016/S0263-7863(96)00035-X).

Al-Rousan, T., Sulaiman, S. and Salam, R.A. (2010). WPRiMA tool: Managing risks in Web projects. (Web Project Risk Management Assessment). *International Journal of Business, Economics, Finance, and Management Science*, 8(8), 1-8.

AL Mousli, M. H. and El-Sayegh, S. M. (2016). Assessment of the design–construction interface problems in the UAE. *Architectural Engineering and Design Management*, 12(5), 353-366.

Alasuutari, P., Bickman, L. and Brannen, J. (2008). *Social Research Methods*. Great Britain: The Cromwell Press.

Ali, A.S. and Kamaruzzaman, S.N. (2010). Cost performance for building construction projects in Klang Valley. *Journal of Building Performance*, 1(1).

Almeida MV. and Oreta AWC. (2020). A risk assessment model for high-rise school building project in Metro Manila, Philippines. *International Journal of Geomate*. 18(69):30–7. doi: 10.21660/2020.69.5728.

Almeleh, C., Mncube, L. and Oosthuizen, M., (2011). Perceived Barriers to Entry into Self-Employment in Khayelitsha, South Africa: Crime, Risk and Start-Up Capital Dominate Profit Concerns.

Al-Salman, A. (2004). Assessment of risk management perception and practices of construction contractors in Saudi Arabia. Master of Science, Fahd University of Petroleum & Minerals.

Al-Shibly, H. H, Lousi B. M. and Hiassat, M.A. (2013). The impact of risk management on construction projects success from the employees' perspective. *Interdisciplinary Journal of Contemporary Research in Business*, 5(4),12- 43

Altoryman, A. (2014). Identification and assessment of risk factors affecting construction projects in the Gulf region: Kuwait and Bahrain. PhD thesis, The University of Manchester, Manchester, UK. Retrieved August 16th, 2017 from: <https://www.escholar.manchester.ac.uk/uk-ac-man-scw:221966>.

Ambe, I.M. and Badenhorst-Weiss, J. A. (2012). An exploration of public sector supply chains with specific reference to the South African situation. *Journal of Public Administration*, 46(3):1100–15.

Anderson, V. (2013). *Research Methods in Human Resource Management*, 3rd edition London. Chartered Institute of Personnel and Development.

Andres, C. (2011). ‘Family ownership, financing constraints and investment decisions’, *Applied Financial Economics*, 21, 1641-1659; <http://doi.org/10.1080/09603107.2011.589865>.

Ansah, R. H. and Sorooshian, S. (2017). Effect of the lean tools to control external environment risks of construction projects. doi:10.1016/j.scs.2017.03.027.

Ansah, S.K. (2011). Causes and effects of delayed payments by clients on construction projects in Ghana. *Journal of Construction Project Management and Innovation*, 1(1): 27-45.

Antony, A. M. (2013). ‘The legal regulation of construction procurement in South Africa, Unpublished Masters Dissertation, Faculty of Law, South Africa, Stellenbosch University. Africa.

Apolot, R., Alinaitwe, H. and Tindiwensi, D. (2011). An investigation into the causes of delay and cost overrun in Uganda’s public sector construction projects: *In second International conference on advances in Engineering & Technology*, 305 - 311. Retrieved from the World Wide Web: [http://web.usm.my/jcdc/vol18_2_2013/JCDC%2018\(2\)%202013-Art.%203%20\(33-47\).pdf](http://web.usm.my/jcdc/vol18_2_2013/JCDC%2018(2)%202013-Art.%203%20(33-47).pdf)

Asadi, Z. (2015). An investigation of risk management strategies in projects. *Marketing and Branding Research*, 2, 89-100.

Aurini, J.D., Heath, M. and Howells, S. (2016). *The how-to qualitative research*. London: Sage Publications.

Aven T. and Renn O. (2009). On risk defined as an event where the outcome is uncertain. *Journal of Risk Research* 12(1):1-11. (DOI:<https://doi.org/10.1080/13669870802488883>; downloaded on 17 March 2018.)

Babbie, E. (2011). *The practice of social research*. 12th Edition, Wadsworth, Belmont.

Babbie, E. and Mouton, J. (2010). *The practice of social research*. Cape Town: Oxford University Press.

Babbie, E. R. (2016). *The Practice of Social Research* (14th ed.). Boston: Cengage Learning.

Babin, B. and Zikmund, W. (2015). *Exploring marketing research*. 11th ed. Boston, MA: Cengage Learning.

Baccaro, L. and Pontusson J. (2016). Rethinking comparative political economy: the growth model perspective, *Politics and Society*, 44 (2):175–207.

Backhaus, Klaus, and Margit Meyer (1984), Country Risk Assessment in International Industrial Marketing, in New Developments in Industrial Marketing, Backhaus, K. and D. T. Wilson, eds., Berlin, Heidelberg, New York 1985.

Bakhareva, O.V. and Kordontchik, D. M. (2019). Implementation of technological and management innovations: BIM-model in architecture, design, construction, and operation. *BIM in Construction & Architecture*. Available from: doi:10.23968/bimac.2019.007

Balcilar, M., Gupta, R. and Jooste, R. (2017). "South Africa's economic response to monetary policy uncertainty." *Journal of Economic Studies* 44, 2 (May 8, 2017): 282–93. <http://dx.doi.org/10.1108/jes-07-2015-0131>.

Balogun, O.A., Ansary, N. and Agumba, J.N. (2016). Investigating challenges and barriers facing construction of small, medium-sized enterprises in credit accessibility in the South African construction industry. 4th *International Conference of Socio-Economic Researchers ICSR*, 27-29 May, Zlatibor, Serbia, 45-65.

Baloi, D. and Price, A. (2012). Modelling global risk factors affecting construction cost performance. *International Journal of Project Management*, 21(4): 261-269.

Banaitiene, N. and Banaitis, A. (2012) Risk Management in Projects: Peculiarities of Lithuanian Construction Companies. *International Journal of Strategic Property Management*, 15 (1), 60-73.

Barboza, R. F. (2012). Implementing Lean construction in a traditional project management culture: challenges and roadblocks. 835-846.

Barker, F.S. (2007). *The South African labour market: Theory and practice*. Fifth edition. Cape

Bartley, T., Andersson, K., Jagger, P. and Laerhoven, F.V. (2008). The contribution of institutional theories to explaining decentralization of natural resource governance. *Society & Natural Resources*, 21(2), 160–174.

Basardien, F., Parker, H., Bayat, M. S., Friedrich, C. and Appoles, S. (2014). Entrepreneurial Orientation of Spaza Shop Entrepreneurs Evidence from A Study of South African and Somali Owned Spaza Shop Entrepreneurs in Khayelitsha.

Bashir, A. et al. (2015). Overcoming the challenges facing lean construction practice in the UK contracting organisation. *International Journal of Architecture, Engineering and Construction*, 4(1): 10-18.

Berg, B. L. (2012). *Qualitative Research Methods for the Social Science* 8th ed. Long Beach: Allyn and Bacon.

Berg, B.L. and Lune, H. (2012). *Qualitative Research Methods for the Social Sciences* 8th Edition, Pearson, Upper Saddle River, NJ.

Bernstein, P. L. (1996). *Against the gods - the remarkable story of risk*. Canada: John Wiley and Sons Ltd.

Bhattacharjee, A. (2012). *Social science research: Principles, methods, and practices*, University of South Florida, Tampa.

Bhorat, H., Lilenstein, K., Oosthuizen, M. and Thornton, A. (2016). "Vulnerability in Employment: Evidence from South Africa." Development Policy Research Unit Working Paper 201604. DPRU, University of Cape Town.

Blaauw, P.F. and Bothma, L. J. (2003). Informal labour markets as a solution for unemployment in South Africa – a case study of car guards in Bloemfontein. *South African Journal of Human Resource Management*, 1(2):40–44.

Blaauw, P.F. (2010). The socio-economic aspects of day labouring in South Africa. Unpublished D Com thesis, Department of Economics and Econometrics. Johannesburg: University of Johannesburg.

Blaudziunas. (2016). Project risk management. *Systems and Services International Digital Library Perspectives*, 22(4), 250-260.

Blaxter, L, Hughes, C. and Tight, M. (1996): *How to Research*, Buckingham, Open University; Press.

Bless, C., Higson-Smith, C. and Sithole, S.L. (2013). *Fundamentals of social research methods: An African perspective*. 5th edition. Cape Town: Juta.

Bolton, P. (2010) Government Procurement and Policy Promotion in South Africa. Supplement to the 2009 Procurement Journal, 10-11.

BonÖglioli A and Gancia G. (2013). "Uncertainty, Electoral Incentives and Political Myopia", *The Economic Journal*, 123, 568, 373-400.

Borghesi A. and Audenzi GB. (2013). *Risk management: How to Assess, Transfer and Communicate Critical Risks*. 1st ed. New York, N.Y.: Springer Milian.

Bourne, L. S. (1981). *The Geography of Housing*. V. H Winston and Sons. Toronto

Bowen, P., Cattell, K., Hall, K., Edwards, P. and Pearl, R. (2012). Perceptions of Time, Cost and Quality Management on Building Projects. *Construction Economics and Building*, 2(2):48-56.

Branco, R.C. (2015). The BRICS: Some historical experiences, growth challenges and opportunities. Fundacao Getulio Vargas, Centre for Growth and Economics Development, 1-26. <http://hdl.handle.net/10438/14079>

Brannen, J. (2017). *Mixing Methods: Qualitative and Quantitative Research*. Abingdon-on-Thames: Routledge.

Brashers, D. E. (2001). Communication and uncertainty management, *Journal of Communication*, 5(1), 477-497.

Braun, V. and Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in Psychology*, 3 (2): 77-101.

Brigham, E. and Ehrhardt, M. (2014). *Financial Management: Theory and Practice 14th Edition*. Ohio: South-Western Cengage Learning.

Brink, A., Cant, M. and Ligthelm, A. (2003). Problems Experienced by Small Businesses in South Africa. In 16th Annual Conference of Small Enterprise Association of Australia and New Zealand (Vol. 28).

British Standards BS 6079-4 (2006). "Project management - Part 4: Guide to project management in the construction industry" British Standards Institute.

Brown, C. (2017). *Achieving evidence-informed policy and practice in education: Evidenced*. Bingley: Emerald Publishing.

Bryman, A. (2016). *Social Research Methods* (5th ed.). Oxford, 373-374.

Bryman, A. (2012). *Social Research Methods*. 4th ed. Oxford: Oxford University Press.

- Brynard, D.J., Hanekom, S.X. and Brynard, P.A. (2014). *Introduction to Research*. 3rd ed.
- Burger, P. and Fourie, F. (2018). The informal sector, economic growth and the business cycles in South Africa: Integrating the sector into macroeconomic analysis. in F. Fourie and C. Skinner (eds). *The South African Informal Sector: Creating Jobs, Reducing poverty.*, 201-225, HSRC Press. Cape Town.
- Burns, N. and Grove, S.K. (2003). *Understanding nursing research*. 3rd Ed. Philadelphia, W.B. Saunders Company.
- Caliendo, M. and Kritikos, A.S. (2009). 'I want to, but I also need to': Start-ups resulting from opportunity and necessity, IZA Discussion Paper No. 4661. Bonn: Institute for the Study of Labor (IZA). Available: <http://www.econstor.eu/bitstream/10419/35884/1/618732640.pdf>. [2014, June 10]
- Callaghan, C. and Venter, R. (2011). An Investigation of the Entrepreneurial Orientation, Context and Entrepreneurial Performance of Inner-City Johannesburg Street Traders. *Southern African Business Review*, 15 (1).
- Cameron, S and Price, D. (2009). *Practical Business Research: An overview*. CIPD Books Stores, United Kingdom.
- Canals, L. (2017). Instruments for Gathering Data; Qualitative approaches to research on plurilingual education.
- Carr, M., Chen, M.A and Tate, J. (2000). Globalization and Home-Based Workers. *Feminist Economics*, 6(3), 123-142.
- Castells, M. and Portes, A. (1989). "World Underneath: The Origins, Dynamics, And Effects of the Informal Economy." In *The Informal Economy: Studies in Advanced and Less Developed countries*, eds. A. Portes, M. Castells and L. Benton. Baltimore: John Hopkins University Press.

Castleberry, A. and Nolen, A. (2018). Thematic Analysis of Qualitative Research Data: Is It as Easy as It Sounds? *Currents in Pharmacy Teaching and Learning*, 10, 807-815. <https://doi.org/10.1016/j.cptl.2018.03.019>.

Chandra, V., Nganou, J. and Noel, C. (2002). Constraints to Growth in Johannesburg's Black Informal Sector: Evidence from the 1999 Informal Sector Survey, World Bank Report No. 24449-ZA, June.

Chang, T., Hwang, B.-G., Deng, X., & Zhao, X. (2018). Identifying political risk management strategies in international construction projects. *Advances in Civil Engineering*, 2018.

Charman, A., Petersen, L. and Piper, L. (2012a). From Local Survivalism to Foreign Entrepreneurship: The Transformation of the Spaza sector in Delft, Cape Town. *Transformation*, 78, 47-73.

Charmaz, K. (2014). *Constructing Grounded Theory*. 2nd ed. Los Angeles: Sage Publishers.

Chatterjee, K., Zavadskas, E. K., Tamosaitiene, J., Adhikary, K. and Kar, S. (2018). A hybrid MCDM technique for risk management in construction projects. *Symmetry-Basel*, 10(2), art. no. 46. <https://doi.org/10.3390/sym10020046>.

Chaudhary, R. and Chaudhary, R. (2017). Corporate Social Responsibility and Employee Engagement: Can CSR help in redressing the engagement gap? *Social Responsibility Journal*, 13(2), 323–338. doi:10.1108/SRJ-07-2016-0115

Chen, M.A. (2007). *Rethinking the informal economy: Linkages with the formal economy and the formal regulatory environment*. DESA working paper no. 46. New York: Department of

Chen, M.A. (2012). Entrepreneurship in Africa: Challenges for Human, Social and Economic Development. *Social Work/Maatskaplike Werk*, 39(3):88-90.

Chia ES. (2006). Risk assessment framework for project management. Presented at the 2006 IEEE International Engineering Management Conference, IEEE, pp. 376–379.

Chia, S.E. (2006). Risk Assessment Framework for Project Management. *IEEE*, 376- 379.

Chihuri, S. and Pretorius, L. (2011). Managing Risks for Success in a South African Engineering and Construction Project Environment. *South African Journal of Industrial Engineering*, 21(2): 63-77.

Chileshe, N. and Yirenskyi-Fianko, A. B. (2012). An evaluation of risk factors impacting construction projects in Ghana. *Journal of Engineering, Design and Technology*, 10(3), 306-329. [https://doi.org/ 10.1108/17260531211274693](https://doi.org/10.1108/17260531211274693).

Chimucheka, T. and Mandipaka, F. (2015). Challenges Faced By Small, Medium And Micro Enterprises in the Nkonkobe Municipality. *International Business & Economics Research Journal*, 309-316.

Choi, J., Mogyoro, M. and Pehrsson, A. 2011, 'Influence of internal and external factors on expansion strategy Swedish Cleantech Subsidiaries in the USA', Unpublished Masters Dissertation, School of Business and Economics, Linnaeus University, Växjö, Sweden, viewed 08 September 2015, from <http://docplayer.net/14797071-Influence-of-internal-and-external-factors-on-expansion-strategy.html>

Choudhry, R.M., Aslam, M.A., Hinze, J.W. and Arain, F. M. (2014). Cost and Schedule Risk Analysis of Bridge Construction in Pakistan: Establishing risk guidelines. *Journal of Construction, Engineering and Management*, 140(7), 04014020. [https://doi.org/10.1061/\(asce\)co.1943-7862.0000857](https://doi.org/10.1061/(asce)co.1943-7862.0000857).

Cichello, P. (2005). Hindrances to Self-Employment: Evidence from the 2000 Khayelitsha/Mitchell's Plain Survey, Working Paper 101, Centre for Social Science Research, University of Cape Town.

Cichello, P., Almeleh, C., Mncube, L. and Oosthuizen, M. (2011). Perceived Barriers to Entry into Self-Employment in Khayelitsha, South Africa: Crime, Risk and Start-Up Capital Dominate Profit Concerns.

Clark. (2016). Uncertainty, threat and opportunity: Examining risk preferences of public employees. *ProQuest*, 2-10.

Clark. (2016). Uncertainty, threat, and opportunity: Examining risk preferences of public employees. *ProQuest*, 2-10.

Colin, C and Nadin, S. (2012). Tackling the undeclared economy in the European Construction Industry, Sheffield, UK: University of Sheffield, Centre for Regional Economic and Enterprise Development Management School. *Policy Studies*, 33 (3):193-214.

Collis, J. and Hussey, R. (2014). *Business research: A practical guide for undergraduate and postgraduate students*. 4th edition. United Kingdom: Palgrave Macmillan

Construction Industry Development Board. (2014). Development through partnership, concrete, issue 1, July 2014. Available at:<http://www.cidb.org.za/publications/Documents/Concrete%20Newsletter%20-%20Issue%201.pdf> [Accessed July 19 2020 construction management. *Engineering*, 5(6), 515-517.

Cooper, D. F., Bosnich, P. M., Grey, S. J., Purdy, G., Raymond, G. A., Walker, P. R. and Wood, M. J. (2014). *Project risk management guidelines: Managing risk with ISO 31000 and IEC 62198* (2nd ed.). New York, US: John Willey & Sons, Ltd.

Corbin, J. and Strauss, A. (2015). *Basics of qualitative research: Techniques and procedures for developing grounded theory*, 4th edn. Sage, Thousand Oaks, CA

Craig, T.D., Maggitti, P.G. and Clark, K.D. (2014). 'Knowledge flows and constraints to the entrepreneurial process in entrepreneurial resourcefulness: Competing with constraints', in A.C. Corbett & A.K. Jerome (eds.), *Entrepreneurial resourcefulness: Competing with constraints*, pp. 85–205, Emerald Group Publishing Limited, Bingley, West Yorkshire

Creamer, T. (2005). Brand new multibillion-rand fuel-from-coal plant mooted. *Creamer Media's Engineering News*. Available

Creswell, J. W. (2013). *Research design: Qualitative, quantitative and mixed methods approach*. (2nd ed.). Belmont, CA: Sage.

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approach*. 4th Edition. Los Angeles, US: Sage Publications.

Creswell, J. W., Hanson, W. E., Clark Plano, V. L. and Morales, A. (2007). Qualitative Research Designs: Selection and Implementation. *The Counseling Psychologist*, 35, 236-264. <https://doi.org/10.1177/0011000006287390>

Creswell, J.W. and Plano Clark, V.L. (2007). *Mixed methods research*. USA: Sage Publications, Inc.

Creswell, J.W. and Plano Clark, V.L. (2011). *Designing and conducting mixed methods Research*. 2nd ed. USA: Sage Publications, Inc.

Creswell, J.W. (2009). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. 3rd ed. Los Angeles: Sage.

Creswell, J. W., & Clark, V. L. P. (2017). *Designing and Conducting Mixed Methods Research*. Thousand Oaks, CA: Sage Publications.

Creswell, J.W. (2014). *Research design: qualitative and quantitative approaches*. California: Sage.

Creswell, J.W. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*, 4th edn. Pearson, Boston, MA.

Creswell, J.W. and Creswell, J.D. (2017) *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. 4th Edition, Sage, Newbury Park.

Daft, R. L. and Lengel, R. H. (1986), "Organizational information requiem media richness and structural design", *Management Science*, 32 (5):554-571.

Darnall, R. and Preston, J.M. (2010). *Project Management from Simple to Complex*, Flat World Knowledge.

David, S., Ulrich, O., Zelezeck, S. and Majoe, N. (2012). *Managing Informality: Local Government Practices and Approaches Towards the Informal Economy – Learning Examples from Five African Countries*. SA LED Network / SALGA and LEDNA.

Davis, K. (2017). An empirical investigation into different stakeholder groups' perception of project success. *International Journal of Project Management*, 35 (4), 604-617. doi: <http://doi.org/10.1016/j.ijproman.2017.02.004>.

De Araujo, M. C. B., Alencar, L. H. and de Miranda Mota, C. M. (2017). Project procurement management: A structured literature review. *International Journal of Project Management*, 35(3), 353-377. doi: <http://dx.doi.org/10.1016/j.ijproman.2017.01.008>

De Marco, A. and Thaheem, M.J. (2014). Risk analysis in construction projects: a practical selection methodology. *American Journal of Applied Sciences*, 11(1): 74.

De Soto, H. (1989). *The other path: The economic answer to terrorism*. New York, NY: Harper Collins.

De Vaus, D. (2001). *Research design In Social Research*, Sage publications, California.

De Vos, A., Delpont, C., Fouché, C.B. and Strydom, H. (2011). *Research at grass roots: A primer for the social science and human professions*. Pretoria: Van Schaik Publishers.

De Vos, A. S. (2005). Scientific theory and professional research. In De Vos A.S., Strydom, H., Fouché C.B. & Delpont C.S.L. *Research at the grass roots for the social sciences and human service professions*. 3 rd ed. Pretoria: JL Van Schaik Publishers.

De Vos, AS, Strydom, H, Fouché, C. B and Delpont, C.S.L. (2005). *Research at grassroots: for the social sciences and human service professions*; 3rd ed. Pretoria: Van Schaik.

Deeming, C. and Smyth, P. (2015). Social Investment After Neoliberalism: Policy Paradigms and Political Platforms. *Journal of Social Policy*, 44(2), 297-318. <https://doi.org/10.1017/S0047279414000828>.

Delpont, C.S.L. and Roesternburg, W. J. H. (2011). Quantitative data collection methods: questionnaires, checklists, structured observations, and structured interview schedules.

Delpont, C.S.L. and Fouché, C.B. (2011). Mixed methods research. In De Vos A.S., Strydom, H., Fouché C.B. & Delpont C.S.L. *Research at the grass roots for the social sciences and human service professions*. 4th ed. Pretoria: JL Van Schaik Publishers.

Delpont, C.S.L. and Roestenburg, W.J.H. (2011). Quantitative data collection methods. In De Vos A.S., Strydom, H., Fouché C.B. & Delpont C.S.L. *Research at the grass roots for the social sciences and human service professions*. 4th ed. Pretoria: JL Van Schaik Publishers.

Deng, X.; Pheng, L.S. and Zhao, X. (2014). Project system vulnerability to political risks in international construction projects: The case of Chinese contractors. *Project Management Journal*, 45, 20–33.

Denscombe, M. (2010). *The good research guide for small-scale social research projects*. 4th Edition. Berkshire: McGraw-Hill Education.

Denzin, N.K. and Lincoln, Y.S. (2018). Introduction: The discipline and practice of qualitative research. In Denzin, N.K. and Lincoln, Y.S. (eds). *The SAGE handbook of qualitative research*. 5th ed., Thousand Oaks, CA: SAGE Publishing: 1-19.

Devey, R, Skinner, C and Valodia, I. (2006a). Definitions, Data, and the Informal Economy in South Africa: A Critical Analysis. In Padayachee, V (ed.): *The development decade? Economic and social change in South Africa, 1994 – 2004*. Cape Town: Human Sciences Research Council Press: 302-323.

Devey, R. (2003). *Characteristics of informal workers and their households: concepts and measurement using household surveys*. Department of Community and Development

Devey, R., Skinner, C. and Valodia, I. (2006). *Second best? Trends and Linkages in the Informal Economy in South Africa*. Cape Town: University of Cape Town, Development Policy Research Unit.

Dey, P.K. (2009). Managing risks of large-scale construction projects. *Cost Engineering*, 51(6), 23-27.

Dickson-Swift, V., James, E. L., Kippen, S. and Liamputtong, P. (2007). Doing sensitive research: What challenges do qualitative researchers face? *Qualitative Research*, 7(3), 327–353. <https://doi.org/10.1177/1468794107078515>

Diedericks, R. (2015). *Incubator services that small service organisations require from a university business incubator*. Vanderbijlpark: NWU. (Thesis-PhD). [Internet:<http://hdl.handle.net/10394/16545>; downloaded on 08 November 2018.] Disciplines, University of Natal.

Dlamini, S. (2012). *Relationship of construction sector to economic growth*. School of Construction management and engineering, University of Reading, UK.

Du Plooy-Cilliers, F., Davis, C. & Bezuidenhoud, R.M. 2014. *Research matters*. Cape Town: Juta & Company LTD.

Dube, S. and Zhou, Y. (2013), The Repo Rate Pass-Through to the Prime Rate in South Africa: Evidence from ARDL and FMLS Models, *Journal of Business Theory and Practice*, 1(2), 199-213.

Duffy, T.M. and Jonassen, D.H. (1992). Constructivism. New implications for Instructional Technology. In T.M. Duffy, & D.H. Jonassen (Eds.), *Constructivism and the Technology of Instruction. A conversation* (pp. 1–16). Hove and London: Lawrence Erlbaum.

Dufour, Y., Steane, P. and Corriveau, A. M. (2018). From the organizational life cycle to ecocyclel: a configurational approach to strategic thinking. *Asia-Pacific Journal of Business Administration*.

Edwards, D. J and Holt, G. D. (2010). The case for “3D triangulation” when applied to construction management research. *Construction Innovation*, 10(1), 25 – 41.

Ehsan, N., Alam, M., Mirza, E. and Ishaque, A. (2010). Risk management in construction industry. *International Journal of Project Management*, 61(2), 173-193.

El-Sayegh, S.M. (2008). Risk assessment and allocation in the UAE construction industry. *International Journal of Project Management*, 26, 431–438.

El-Sayegh, S.M. (2014). Risk assessment and allocation in the UAE construction industry. *International Journal of Project Management*, 26, 431–438.

Enhassi, A., Al- Hallaq, K. and Mohammed, S., 2009. Causes of contractors' business failure in developing countries: The case of Palestine. *Journal of Construction in Developing Countries*, 11(2), 1-14.

Enshassi, A., Mohamed, S., and Abu Mousa, J. (2008). Risk management in building projects in Palestine: Contractors’ perspective, *Emirates Journal for Engineering Research*, 13 (1): 29-44.

Eriksson-Zetterquist, U., Müllern, T. and Styhre, A. (2011). *Organization Theory: a practice-based approach*. Oxford University Press.

Essop, H. and Yu, D. 2008. *Alternative definitions of informal sector employment in South Africa*. Stellenbosch economic working papers: 21/08. Stellenbosch: Stellenbosch University.

Eybpoosh, M., Dikmen, I. and Birgonul, M.T. (2011). Identification of risk paths in international construction project using structural equation modeling. *Journal of Construction Engineering and Management*, 1164-1175.

Fahmi, I. (2013). *Corporate Financial Management and Capital Markets*. Jakarta: Mitra Wacana Media.

Fereday, J. and Muir-Cochrane, E. 2006. Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development. *International Journal of Qualitative Methods*, 5(1):80–92.

Fernando, C. K., Hosseini, M. R., Zavadskas, E. K., Perera, B. A. K. S. and Rameezdeen, R. (2017). Managing the financial risks affecting construction contractors: Implementing hedging in Sri Lanka. *International Journal of Strategic Property Management*, 21(2), 212-224. <https://doi:10.3846/1648715X.2017.1301592>.

Fiess, N.M., Fugazza, M. and Maloney, W.F. 2010. Informal self-employment and macroeconomic fluctuations. *Journal of Development Economics*, 91(2):211–226. Available: <http://linkinghub.elsevier.com/retrieve/pii/S0304387809000996>.

Firmenich. (2017). Customisable framework for project risk management. *Construction Innovation*, 17(1), 68-89.

Flanagan, R. and Norman, G. (1993). *Risk management and construction*, Blackwell Publishing, Oxford, UK.

Flick, U. 2011. Mixing Methods, Triangulation, and Integrated Research. *Qualitative Inquiry and Global Crises*, 7-132.

Fligstein, N. and McAdam, D. (2011). Toward a general theory of strategic action fields. *Sociological theory*, 29(1), 1-26.

Fortunato, B.R., Hallowell, M.R., Behm, M. and Dewlaney, K. (2012). Identification of safety risks for high-performance sustainable construction projects. *Journal of Construction Engineering and Management*, 138(4), 499-508. [https://doi.org/10.1061/\(ASCE\)CO.1943-7862.0000446](https://doi.org/10.1061/(ASCE)CO.1943-7862.0000446).

Fortunato, B.R., Hallowell, M.R., Behm, M. and Dewlaney, K. (2012). Identification of safety risks for high-performance sustainable construction projects. *Journal of Construction Engineering and Management*, 138(4), 499-508. [https://doi.org/10.1061/\(ASCE\)CO.1943-7862.0000446](https://doi.org/10.1061/(ASCE)CO.1943-7862.0000446)

Fouché C.B. and Bratley, A. 2011. Quantitative data analysis and interpretation. In De Vos, A.S. Strydom, H. Fouché, C.B. & Delpont, C.S.L. Research at the grass roots for the social sciences and human service professions. 4 nd ed. Pretoria: JL Van Schaik Publishers

Free State Provincial Government. (2013). *Free State Growth and Development Strategy [FSGDS]: Free State vision 2030—the future we want*. Bloemfontein:

Frimpong, Y., Oluwoye, J. and Crawford, L. (2003). Causes of delay and cost overruns in construction of groundwater projects in a developing country, Ghana as a case study. *International Journal of Project Management*, 21(5), 321-326. doi: [http://dx.doi.org/10.1016/S0263-7863\(02\)00055-8](http://dx.doi.org/10.1016/S0263-7863(02)00055-8)

Fumo, NDG, and Jabbour, CJC. 2011. Barriers faced by MSEs. Evidence from Mozambique. *Industrial Management and Data Systems*, 111 (6):849-868

Gaskell, G and Allum, N. (2011) *Risk: Two Cultures of Risk*. The London School of Economics and Political Science: London.

Gay, L.R., Mills, G.E. and Airasian, P. (2012). Educational research: Competencies for analysis and applications. Pearson Education. Upper Saddle River: NJ. (20) (PDF) *Educational Research Methodology Framework*. Available from: https://www.researchgate.net/publication/282914402_Educational_Research_Methodology_Framework

Gerxhani, K. (2004). The informal sector in developed and less-developed countries: A literature survey. *Public Choice*, 1143 (4): 295-318.

Ghuri, P., Grønhaug, K., & Strange, R. (2020). *Research Methods in Business Studies* (5th ed.). Cambridge University Press. <https://doi.org/10.1017/9781108762427>

Ghahramanzadeh, M. (2013). *Managing risk of construction projects: A case study of Iran*. PhD Thesis, University of East London, UK. Retrieved December 10th, 2015, from: <http://hdl.handle.net/10552/3502>

Gitau, L.M.B. (2015). The effects of risk management at project planning phase on performance of construction projects in Rwanda, Master's thesis, department of Entrepreneurship, Technology, Leadership and Management in the school of Entrepreneurship, Procurement and Management, University of Agriculture and Technology, Kenya.

Glaser B.G. (2002). Constructivist Grounded Theory. *Quantitative social research*. 3(3):1-20.

Golafshani, N. (2003). *Understanding reliability and validity in qualitative research*. The qualitative report, 8(4): 597-606.

Gough, K. V., Tipple, A. G. and Napier, M. (2003). Making a Living in African Cities: The Role of Home-Based Enterprises in Accra and Pretoria. *International Planning Studies*, 8(4), 253-277.

Grace, M. (2010). Pre-construction cost control for hard bid projects. *Cost Engineering*, 52(2), 8-17.

Gray, D.E. (2009). *Doing research in the real world*. 2nd edition. London: SAGE Publications INC

Greeff, M. (2013). Information collection: interviewing. (In De Vos, A.S., Strydom, H., Fouché, C.B. and Delpont, C.S.L. *Research at grass roots for the social sciences and human services professions*. 4th ed. Pretoria: Van Schaik. p. 341-375).

Guest, G., Namey, E.E. and Mitchell, M.L. (2013). *Collecting Qualitative Data: A Field Manual for Applied Research*. USA: SAGE Publications Inc.

Guha-Khasnobis, B. and Kanbur, R. (2006). Introduction: informal markets and development, in B. Guha-Khasnobis & R. Kanbur (eds.) *Informal labour markets and development*, UNU-WIDER Studies in Development Economics and Policy, Helsinki: Palgrave Macmillan.

Gupta, M.C., Sahib, G.K. and Chahal, H. (2013). 'Improving market orientation: The theory of constraints-based framework', *Journal of Strategic Marketing* 21(4),303-

322.<https://doi.org/10.1080/0965254x.2013.790467>.

Gwangwava E, Manuere F, Kudakwashe G, Tough C and Rangarirai F. (2014). An assessment of risk management practices in SMEs in Zimbabwe: a review and synthesis. *IOSR Journal of Humanities and Social Science* 19(8):06-14.

Hair, J.F. jr, Money, A.H., Samouel, P. and Page, M. (2017). *Research methods for business*; John Wiley and Sons Ltd.

Halou, M. I. K., Samin, R. and Ahmad, M. (2019). Impacts of change management on risk and cost management of construction projects. *Journal of Project Management*, 157–164. Available from: doi: 10.5267/j.jpm.2019.1.005

Hammarberg, K., Kirkman, M. and Lacey, S. (2016). *Qualitative research methods*

Hammond, M. and Wellington, J. (2013). *Research methods. The key concepts*. Routledge. Taylor and Francis Group. New York.

Hanna, A. S., Thomas, G. and Swanson, J. R. (2013). Construction risk identification and allocation: Cooperative approach. *Journal of Construction Engineering and Management*, 139(9), 1098–1107. doi: [http://dx.doi.org/10.1061/\(ASCE\)co.1943-7862.0000703](http://dx.doi.org/10.1061/(ASCE)co.1943-7862.0000703)

Harding, J. (2013). *Qualitative Data Analysis from Start to Finish*. London: Sage Publications.

Harrison, P., Todes, A. and Watson, V. (2008). *Planning and Transformation: Learning from the Post-Apartheid Experience*. Abingdon: Routledge.

Hart, K. (1973). Informal income opportunities and urban employment in Ghana. *Journal of Modern African Studies*, 11 (1): 61-89.

Hassanein, A. A. G. and Afify, H. (2007). A risk identification procedure for construction contracts - a case study of power station projects in Egypt. *Civil Engineering Environmental Systems*, 24(1): 3-14

Haupt, T. and Harinarain, N. (2016). The image of the construction industry and its employment attractiveness , *Acta Structilia*: 23 No. 2

Heintz, J. and Posel, D. (2008). Revisiting informal employment and segmentation in the South African labour market. *South African Journal of Economics*, 76(1):26–44. Available: <http://onlinelibrary.wiley.com/doi/10.1111/j.1813-6982.2008.00153.x/full>.

Henderson, K.A. (2011). Post-Positivism and the Pragmatics of Leisure Research. *WaLeisure Sciences*, 33(4): 341-346.

Hennink, M., Hutter, I. and Bailey, A. 2011. *Qualitative Research Methods*. London: SAGE Publications Ltd.

Hernaus, T., Pejić Bach, M. and Bosilj Vukšić, V. (2012). Influence of strategic approach to BPM on financial and non-financial performance. *Baltic Journal of Management*.

Hopkin, P., (2018). *Fundamentals of risk management: understanding, evaluating and implementing effective risk management*. Kogan Page Publishers.

Howitt, D. and Cramer, D. (2014). *Introduction to research methods in psychology*. Edinburgh Gate: Pearson Education.

Howitt, D., and Cramer, D, (2014). *Introduction to research methods in psychology*. Harlow, Pearson Education Limited.
<http://www.engineeringnews.co.za/eng/utilities/search/?show=96600>.

Hussein, A. (2009). The use of Triangulation in Social Sciences Research: Can qualitative and quantitative methods be combined? *Journal of Comparative Social Work* 2009(1):1-12.

Husmanns, E. (2012). Behind the rhetoric, the institutional basis of social exclusion and poverty. *IDS Bulletin*, 29 (1): 59-65.

Hwang, B.-G., Zhu, L., Wang, Y. and Cheong, X. (2017), “Green building construction projects in Singapore: cost premiums and cost performance”, *Project Management Journal*, 48 (4): 67-79.

Ibem, E. O., Onyemaechi, P. C. and Ayo-Vaughan, E. A. (2018). Project selection and transparency factors in housing public-private partnerships in Nigeria. *Construction Economics and Building*, 18(2), 15-40. doi: 10. 5130/ajceb. v18i2.5771.

Ibrahim, A. M. (2012). Thematic analysis: A critical review of its process and evaluation. WEI International European Academic Conference Proceedings, Zagreb, Croatia, 14 - 17 October. <http://www.westeastinstitute.com/wp-content/uploads/2012/10/ZG12-191-Mohammed->

Idoro, G. I. and Jolaiya, O. (2010). Evaluating material storage strategies and their relationship with construction project performance. *Proceedings of CIB International Conference on Building*

Idris, U. (2017). Five Retail Outlets that dropped in 2017. Retrieved from www.halomoney.co.id:<https://www.halomoney.co.id/ritel-modern-yang-tumbang-di-2017>

ILO, 2002. Decent work and the informal economy. International Labour Conference 90th Session Report VI. Geneva.

International Labour Office (ILO). (2013). *Women and Men in the Informal Economy: A Statistical Picture (second edition)*—Geneva: ILO, 2013

International Labour Office (ILO). (2014). *International Labour Conference Report V (1), Transitioning from the informal to the formal economy*. Geneva, Switzerland: ILO.

International Labour Organisation. (ILO). 1972. *Employment, incomes and equality: a strategy for increasing productive employment in Kenya*. Geneva: ILO.

International Labour Organisation. (ILO). 1992. *Resolution concerning Geneva, 28 January B 6 February 1992, Report of the Meeting*; International Labour Office, Geneva. Document MELS/1992/D.5

International Labour Organisation. (ILO). 1993. *Resolution concerning statistics, employment in the informal sector*. 15th International Conference of Labour Statisticians. Geneva: International Labour Organisation.

International Labour Organization (ILO). (1995). *World employment report 1995*. Geneva: ILO.

Iqbal, A., Tufail, M. and Lodhi, R. (2015). Employee Loyalty and Organizational Commitment in Pakistani Organizations. *Global Journal of Human Resource Management*, [online] 3(1), 1-11.

Iqbal, S., Choudhry, R.M., Holschemacher, K., Ali, A. and Tamošaitienė, J. (2015). Risk management in construction projects, *Technological and Economic Development of Economy*, 21(1), 65-78. <https://doi.org/10.3846/20294913.2014.994582>.

Jacobsen, S.O., Johnsen, A.R., Gravensen, P. and Schovsbo, N.H. (2015). Risk assessment of impacts on groundwater quantity and quality. M4Shael Gas Consortium European Union's Horizons 2020.

Jayasudha, K. and Vidivelli, B. (2016). Analysis of major risks in construction projects. *Journal of Engineering and Applied Sciences*, 11(11): 6943-6950.

Johnson, B. and Christensen, L. (2012). *Educational Research: Quantitative, Qualitative, and Mixed Approaches* (2nd ed). Boston, MA: Pearson Education, Inc.

Johnstone, D.B. (2006). Financing Higher Education: Cost-Sharing in International Perspective. *Global perspectives on Higher Education*, 3:39. (<https://www.sensepublishers.com/media/405-financing-highereducationa>).

Kajimo-Shakantu, K. (2007). An investigation into the responses of the construction industry to preferential procurement in South Africa. University of Cape Town (Thesis-PhD).

Karim Jallow, A., Demian, P., N. Baldwin, A. and Anumba, C. (2014). An empirical study of the complexity of requirements management in construction projects. *Engineering, Construction and Architectural Management*, 21(5), 505–531.

Karimiazari, A., Mousavi, N., Mousavi, S.F. & Hosseini, S. 2011. Risk assessment model selection in construction industry. *Expert Systems with Applications*, 38(8): 9105-9111.

Karimiazari, A., Mousavi, N., Mousavi, S.F. and Hosseini, S. (2011). Risk assessment model selection in construction industry. *Expert Systems with Applications*, 38(8): 9105-9111.

Kay, D. D. (2011). The relationship between formal and informal employment in South Africa. Urbana: University of Illinois. (Thesis-PhD).

Kazmierczak, A. and Cavan, G. (2011). Surface water flooding risk to urban communities: Analysis of vulnerability, hazard and ex-posure. *Landscape and Urban Planning*, 103 (2), 185-197.

Kikwasi, G.J. (2012). Causes and effects of delays and disruptions in construction projects in Tanzania. *Australasian Journal of Construction Economics and Building, Conference Series*, 1(2), 52-59. Retrieved from the World Wide Web: <http://epress.lib.uts.edu.au/journals/index.php/AJCEB-Conference-Series/article/view/3166>

Kingdon, G. and Knight, J. (2001). *The incidence of unemployment in South Africa*. Paper presented at 2000 annual forum. Trade and Industrial Policy Secretariat.

Kingdon, G. G and Knight, J. (2004). Unemployment in South Africa: The Nature of the Beast. *World Development* 32(3), 391–408.

Kingdon, G. G and Knight, J. (2007). Unemployment in South Africa, 1995–2003: Causes, Problems and Policies. *Journal of African Economics*, 16 (5), 813–48.

Koleczko, K. (2012). Risk and uncertainty in project management and decision making. *Public Infrastructure Bulletin*, 8 (1), 76-82

Kuhn, V. (2014). Managing uncertainty in typical mining project studies. *South African Journal of Industrial Engineering*, 105-120.

Kulkarni, P. (2013). What is triangulation of data in qualitative research? Is it a method of validating the information? [http://www.researchgate.net/post/Whatis triangulation of data in qualitative research? Is it a method of validating the information collected through various methods](http://www.researchgate.net/post/Whatis%20triangulation%20of%20data%20in%20qualitative%20research%3F%20Is%20it%20a%20method%20of%20validating%20the%20information%20collected%20through%20various%20methods).

Kumar, R. (2019). *Research methodology: A step-by-step guide for beginners*. 5th. ed. Thousand Oaks, CA, Sage, 2019.

Kuo, Y.C. and Lu, S.T. (2013). Using fuzzy multiple criteria decision-making approach to enhance risk assessment for metropolitan construction projects. *International journal of Project Management*, 31(2013), 602-614. [https://doi.org/ 10.1016/j.ijproman.2012.10.003](https://doi.org/10.1016/j.ijproman.2012.10.003)

Kyriacou, A.P., Muinelo-Gallo, L. and Roca-Sagales, O. (2015). Construction corrupts: empirical evidence from a panel of 42 countries. *Public Choice*, vol. 165, no. 1/2, 123–45.

Labuschagne, A. (2003). Qualitative research: Airy fairy or fundamental? *The Qualitative Report*, 8(1):100–103.

Lakshmanan, T. (2011). The broader economic consequences of transport infrastructure investments. *Journal of Transportation and Geography* 19(1):1–12.

Lakshmi, S. and Mohideen, M. A. (2012). Issues in reliability and validity of research, *International Journal of Management Research and Review*, 3(4), 2752-2758.

Lapan, S.D., Quarteroli, M.T. and Riemer, F. J. (2012). Introduction to Qualitative Research. In Lapan, S.D., Quarteroli, M.T. and Riemer, F.J. Eds). *Qualitative Research; An Introduction to Methods and Designs*. San Francisco: John Wiley & Sons.

LaPorta, R. and Schleifer, A. (2008). The unofficial economy and economic development. Working Paper Series. Washington, DC: National Bureau of Economic Research. 1-75.

Lazar, Jonathan, Feng, Jinjuan Heidi and Hochheiser, Harry (2010): *Research Methods in Human-Computer Interaction*. Wiley

Lazonick, W and O'Sullivan, M. (2010). Maximizing shareholder value, a new ideology for corporate governance. <https://doi.org/10.1080/030851400360541>.

Leedy, P. and Ormrod, J. (2010). *Practical Research Planning and Design*. University of Northern Colorado (Emerita) University of New Hampshire. Pearson Publishing.

Leedy, P. D. and Ormrod, J. E. (2010). *Practical research: Planning and design*, 9th ed. Upper Saddle River: Prentice Hall.

Lehdonvirta V (2020) *Cloud Empires: How Digital Platforms are Overtaking the State and How we Can Regain Control*. Cambridge, MA: MIT Press.

Lester, A. (2007). *Project Management Planning and Control*, Fifth ed. Elsevier Ltd.

Letchmiah, D.R. (2012) *Understanding the Construction Charter and BBBEE Scorecard, Presentation to Association of South African Quantity Surveyors (KZN Chapter), Durban, South Africa, 11 October 2012*

Levitt, R.E. and Scott, W.R. (2017). Institutional challenges and solutions for global megaprojects in B. Flyvbjerg. (Ed). *The Oxford Handbook of Megaproject Management*, Oxford: Oxford University Press, 96-117.

Lewis, W.A. (1954). Economic Development with Unlimited Supplies of Labour. *Manchester School of Economic and Social Studies*, 22(2):139–191.

Ligthelm, A. (2008). A Targeted Approach to Informal Business Development: the Entrepreneurial Route. *Development Southern Africa*, 25(4).

Ling, F. Y. Y. and Hoi, L. (2006). Risks faced by Singapore firms when undertaking construction projects in India. *International Journal of Project Management*, 24(3), 261-270. doi: <http://dx.doi.org/10.1016/j.ijproman.2005.11.003>

Ling, F. Y. Y. and Li, S. (2012). Using social network strategy to manage construction projects in China. *International Journal of Project Management*, 30(3), 398-406. doi: <http://dx.doi.org/10.1016/j.ijproman.2011.05.010>

Loayza, N.V. and Rigolini, J. (2011). *Informality Trends and Cycles*. World Bank Policy Research Working Paper 4078. Washington D.C.: World Bank

Lombaard, C., Van der Merwe, L., Kele, T. and Mouton, S. 2018. *Elementary statistics for business and economics*. Cape Town: Pearson.

Lopes, L. (2012). Construction in the economy and its role in socio-economic development: G. Ofori (Ed.), *New Perspectives on Construction in Developing countries*, Spon Press, London.

Love, P., Davis, P., Ellis, J. and On Cheung, S. (2010). Dispute causation: identification of pathogenic influences in construction. *Engineering, Construction and Architectural Management*, 17(4): 404-423.

Lund, F. and Skinner, C. (2003). The Investment Climate for the Informal Economy: A Case of Durban, South Africa.

Lund, F. and Skinner, C. (2005). Creating a Positive Business Environment for the Informal Economy: Reflections from South Africa. *School of Development Studies University of KwaZulu-Natal*.

Lund, F. and Skinner, C. (2006). Creating a Positive Business Environment for the Informal Economy: Reflections from South Africa. *School of Development Studies University of KwaZulu-Natal*.

Mabokela, R. and Mawila, K. (2004). The Impact of Race, Gender, and Culture in South African Higher Education. *Comparative Education Review*, 48(4), 396-416

Magidimisha, H. and Gordon, S. (2015). Profiling South African gender inequality in informal self-employment. *Journal of Gender Studies*, 24(3): 275-292.

Mahendra, P. A., Pitroda, J. R. and Bhavsar, J. (2014). A Study of Risk Management Techniques for Construction Projects in Developing Countries International Journal of Innovative Technology and Exploring Engineering (IJITEE) 3 139-42

Mahendra, P. A., Pitroda, J. R. and Bhavsar, J. J. (2013). A Study of Risk Management Techniques for Construction Projects in Developing Countries, International Journal of Innovative Technology and Exploring Engineering, 3(5): 139–142.

Mahendra, P.A., Pitroda, J.R. and Bhavsar, J.J. (2013). A study of risk management techniques for construction projects in developing countries. *International Journal of Innovative Technology and Exploring Engineering (IJITEE)*, 3(5), 139-142. Retrieved from the World Wide Web: <http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.674.2341>

Mahmood, S., Azhar, S. and Ahmad, I. (2011). Evaluation of Florida General Contractors Risk Management Practices. *Revista Ingeniería de Construcción*, 17(1), 60-70.

Makhene, D and Thwala, W.D. (2009). Skilled labour shortages in construction contractors: A Literature Review. Construction Industry Development Board. Available at: <http://hdl.handle.net/10210/5303>.

Makombo, H. M. (2011). ‘The Risk Management Framework for Organizations dealing with Construction Project Management in South Africa ‘, master’s thesis, Faculty of Engineering, Built Environment and Information Technology, University of Pretoria.

Malhotra, N. K. (2010). *Marketing Research: An Applied Orientation* (6th ed.). Upper Saddle River, NJ: Pearson Prentice Hall.

Maloney, W. (2004). Informality Revisited. *World Development* Vol. 32, No. 7, pp. 1159–1178, 2004.

Maloney, W.F. and Bosch, M. (2007). The informal labor market in motion: Dynamics, cycles, and trends, in P.E. Guillermo (ed). *Exit and exclusion*. Washington, DC: International Bank for Reconstruction and Development / The World Bank. 101–131.

Mañelele, I., & Muya, M. (2008). Risk identification on community-based construction projects in Zambia. *Journal of Engineering, Design and Technology*, 6(2), 145-161. <https://doi.org/10.1108/17260530810891289>

Maree, K. 2007. *First steps in research*. Paarl. Van Schaik Publishers

Markey, R. and Patmore, G. (2011). 'Employee participation in health and safety in the Australian steel industry, 1935–2006', *British Journal of Industrial Relations* 49,144 (21) (PDF) *Internal constraints to business performance in black-owned small to medium enterprises in the construction industry*.

Marshall, C. and Rossman, G.B. (2016). *Designing qualitative research*. 4th Edn. London: SAGE.

Marty, H. 2008. *Troubles with triangulation: Advances in mixed methods research*.

Marutlulle, N. K. (2021). A critical analysis of housing inadequacy in South Africa and its ramifications, *Africa's Public Service Delivery and Performance Review* 9(1), 372

Marx J and De Swardt C. (2013). *Financial management in southern Africa*. 4th ed. Cape Town: Pearson.

Mason, M. (2012). 'Sample size and saturation in PhD studies using qualitative interviews', *Qualitative Social Research* 11(3), Art. 8, viewed 29 February 2020, from <http://www.qualitative-research.net/index.php/fqs/article/viewArticle/1428/3027>

Masuku, S. (2001) South Africa: World Crime Capital? *Nedbank ISS Crime Index*, 5(1), 16–21.

Mavodza, J. (2010). *Knowledge Management Practices and the Role of an Academic Library in a Changing Information Environment: The Case of the Metropolitan College of New York*, Thesis submitted in fulfilment of the requirements of Doctor of Philosophy in the Faculty of Humanities, Department of Information Science, University of South Africa.

Mbande, C. (2010). 'Overcoming construction constraints through infrastructure delivery', in Proceedings: The Association of Schools of Construction of Southern Africa (ASOCSA), Fifth Built Environment Conference. Durban, South Africa, July 18–20, 213–232.

McDonald, K. (2008). The Impact of Crime on Small Businesses in South Africa: A Study Commissioned by the South African Presidency. SBP, Johannesburg, South Africa. Available
McHugh, M. L. 2011. Multiple comparison analysis testing in ANOVA. *Biochemia Medica*, 21 (3): 203-209.

McKeever, M. 2007. "Fall back or spring forward? Labor market transitions and the informal economy in South Africa", *Research in Social Stratification and Mobility*, 24: 73–87.

McMillan, J. H. and Schuhmacher, S. (2010). *Research in education: Evidence-based inquiry*. 6th ed. Boston: Pearson Education.

Mehrotra, S. and Biggeri, M. (2007). The empirical context and a theoretical framework, in S. Mehrotra & M. Biggeri (eds.) *Asian informal workers, global risks, local development*, Routledge Studies in the Growth Economies of Asia, London: Routledge.

Mergel, B. (1998). *Instructional Design & Learning Theory*. Available:<http://www.usask.ca/education/coursework/802papers/mergel/mergel.pdf>.
Methods (10th ed.). South-Western Cengage Learning.

Mhlongo, P.M. (2014). The applicability of leaning organisation philosophy for improving process and practices in the university of Technology in Kwazulu-Natal, M. Tech, Durban University of Technology.

Miles, M. B. Huberman, A., M., and Saldana, J. (2014). *Qualitative data analysis: A method sourcebook*. Los Angeles: Sage.

Miles, Matthew B, A Michael Huberman, and Johnny Saldana. (2014). *Qualitative data analysis: A methods sourcebook*. Thousand Oaks, CA: SAGE Publications, Incorporated

Mjoli-Mncube, N. (2005). Opportunities for women in housing and construction. (online). Available [http://www housing.kznti.gov.za](http://www.housing.kznti.gov.za).

Mkhize, S., Dube, G. and Skinner, C. (2013). *Informal economy monitoring study: Street vendors in Durban, South Africa*. Manchester, UK: WIEGO. Available: <http://wiego.org/sites/default/files/publications/files/IEMS-Durban-Street-Vendors-City-Report-English.pdf>.

Mofokeng, T. G. (2012). Assessment of the causes of failure among small and medium sized construction companies in the Free State Province. PhD Thesis, Johannesburg: University of Johannesburg.

Mohammed, S. A. S. and Muhammed, J. (2017). The relationship between agency theory, stakeholder theory and shariah supervisory board in Islamic banking: An attempt towards discussion. *International Journal of ethics and systems*, 33 (1): 75–83.

Mojtahedi, M. and Kabirifar, K. (2019). The impact of Engineering, Procurement and Construction (EPC) Phases on Project Performance: A Case of Large-scale Residential Construction Project. *Buildings* 9(1), 15.

Mosenogi, J.M. (2011). An impact analysis of construction sector on economic growth and household income in South Africa. *Journal of Management and Administration*, Northwest Department of Finance.

Moser, C. (1978). The Informal Sector or Petty Commodity Production: Dualism or Dependence in Urban Development? *World Development*, Vol. 6, No. 9.

Motaleb, O. H. and Kishk, M. (2015). Controlling the risk of construction delay in the Middle East: State-of-the-art review. *Journal of Civil Engineering and Architecture*, 9, 506-516.

Müller, R., L. Zhai, and A. Wang. (2017). “Governance and governmentality in projects: Profiles and relationships with success.” *Int. J. Project Man-age.* 35 (3): 378–392. <https://doi.org/10.1016/j.ijproman.2017.01.007>.

Mullner, C. (2016). Measuring South Africa's informal sector: an analysis of national household surveys. DPRU Working Paper 03/71. Cape Town: Development Policy Research Unit, University of Cape Town.

Munro, A. (2014). *Research Methods in the Arts: A Guiding Manual*. Pretoria: Tshwane University of Technology.

Musa, M. M., Amirudin, R. B., Sofield, T. and Musa, M. A. (2015). Influence of external environmental factors on the success of public housing projects in developing countries. *Construction Economics and Building*, 15(4), 30-44.

Mustafa MA, Al-Bahar JF. Project risk assessment using the analytic hierarchy process. *IEEE Transactions on Engineering Management*. 1991;38(1):46–52. doi: 10.1109/17.65759

Mustaro, P. and Rossi, R. (2013). 'Project Management Principles Applied in Academic Research Projects', *Issues in Informing Science & Information Technology*, 10, 325-340, Computers & Applied Sciences Complete, EBSCOhost.

Napier, M. and Mothwa, M. (2001). Push and Pull Factors in the Initiation and Maintenance of Homework in Two Pretoria Settlements. *Urban Forum*, 12(3/4), 336–351.

National Planning Commission (NPC) (2013). *Our Future – Make It Work: The National Development Plan 2030*. Department of the Presidency, Republic of South Africa.

Neuman W.L. 2014. *Basics of social research: Qualitative and quantitative approaches*. Essex: Pearson Education Limited.

Neves, D. & du Toit, A. (2012). Money and sociality in South African's informal Economy. *Africa*, 82(1), 131-49.

Nieto-Morote, and Ruz, V. (2011). A fuzzy approach to construction project risk assessment *International Journal of Project Management*, 29(2), 220-231.

Nieuwenhuis, J. (2007). Qualitative research designs and data gathering techniques. In Maree, K. (Ed.). *First Steps in research*. Pretoria: Van Schaik Publishers.

Nieuwenkamp, R. (2016). The Global Construction Sector Needs a Big Push on Corporate Responsibility. OECD Insights Debates and Issues. [online]. Available at: <http://oecdinsights.org/2016/08/22/global-construction-sector-corporate-responsibility/>

Nordin, F., Oberg, C., Kollberg, B. and Nord, T. (2010). 'Building a new supply chain position An exploratory case study within the construction industry', *Construction Management and Economics*, 28 1071-1083 <http://doi.org/10.1080/0144618>.

Ntuli, Z. (2005). Fronting Companies Under Fire from Government, Available online http://www.skills_portal.co.za/black_economic_empowerment/46879.htm, Accessed 20 June 2023

Odimabo, O.O. and Oduoza, C.F. (2013). Risk assessment framework for building construction projects in developing countries. *International Journal of Construction Engineering and Management*, 2(5), 143-154. <https://doi.org/10.5923/j.ijcem.20130205.02>.

OECD. (2013). Glossary of Statistical Terms: Data analysis (Online). Available: <http://stats.oecd.org/glossary/details.asp?ID=2973>. (Accessed: 28th June 2020).

Ofori, G. (1990). *The Construction Industry: Aspects of Its Economics and Management*. Singapore University Press, Singapore City.

Ofori, G., (2013). 'Construction in developing countries', *Construction Management and Economics* 25(1), 1–19. <https://doi.org/10.1080/01446190601114134>

Ofori-Kuragu, J. K. and Ayarkwa, J. (2013). The Case for a Construction Industry Council in Ghana, 21 (12):131– 149.

Ogunbayo, O.M. 2014. Assessment of Risk Analysis Processes in the Nigerian Construction Industry: Contractors' and Project Managers' View. *International Journal of Advancement in Research & Technology*, 3(1): 36-42.

Olamiwale, I.O. (2014). Evaluation of risk management practices in the construction industry in Swaziland, master's Thesis, Tshwane University of Technology, Pretoria-South Africa.

Olanrewaju, A. and Abdul-Aziz, A. (2015). An Overview of the Construction Industry. *Building Maintenance Processes and Practices*, 9-32.

O'Leary, Z. (2013). *The Essential Guide to Doing Your Research Project*, Sage. on <http://www.sbp.org.za/index.php?id=23>.

Otobo, O. (2016). Risk management system to guide building construction projects. In developing countries: a case study of Nigeria. *ProQuest*, 170-229.

Owusu, F. (2007). Conceptualizing Livelihood Strategies in African Cities: Planning and Development Implications of Multiple Livelihood Strategies. *Journal of Planning Education and Research*, 26, 450-465.

Öztaş, A. and Ökmen, Ö. (2004). Risk analysis in fixed-price design-build construction projects. *Building and Environment*, 39 (2), 229-237.

Padgett, D. (2016). *Qualitative methods in social work research*, 3rd edn., Sage, Los Angeles, CA.

Palinkas LA, Aarons GA, Horwitz SM, Chamberlain P, Hurlburt M, Landsverk J. Mixed method designs in implementation research. *Administration and Policy in Mental Health and Mental Health Services Research*. 38:44–53.

Palmer, M., Larkin, M., de Visser, R. and Fadden, G. (2010). Developing an interpretative phenomenological approach to focus group data. *Qualitative Research in Psychology*. 7(2):99–121.

Panthi, K., Ahmed, S. M. and Ogunlana, S. O. (2009). Contingency estimation for construction projects through risk analysis. *International Journal of Construction Education and Research*, 5(2), 79-94.

Patton, M. Q. (2002). Qualitative interviewing. *Qualitative Research and Evaluation Methods*, 3, 344–347 pdf) Retrieved on 18 February 2018.

Perera, B. A. K. S., Rathnayake, R. M. C. K. and Rameezdeen, R. (2008). Use of Insurance in Managing Construction Risks: Evaluation of Contractors' All Risks (CAR) Insurance Policy, *Built-Environment-Sri Lanka*, 8(2)

Perera, B.A.K.S., Rameezdeen, R., Chileshe, N. and Hosseini, M.R. (2014) Enhancing the effectiveness of risk management practices in Sri Lankan Road construction projects: A Delphi approach. *International Journal of Construction Management*, 14(1), 1 - 14.

Perry, G.E., Maloney, W.F., Arias, O.S., Fajnzylber, P., Mason, D.A. and Saavedra-Chanduvi, J. (2007). *Informality: Exit and exclusion*. Washington, DC: World Bank.

Philip, K. (2010). Inequality and economic marginalisation: How the structure of the economy impacts on opportunities on the margins. *Law, Democracy and Development*, 14:105–132.

Phillips, P. J. and Pohl, G. (2014). Prospect theory and terrorist choice. *Journal of Applied Economics*, 17(1), 139-160. doi: [http://dx.doi.org/10.1016/S1514-0326\(14\)60006-4](http://dx.doi.org/10.1016/S1514-0326(14)60006-4)

Phoenix, C., Osborne, N.J., Redshaw, C., Moran, R., Stahl-Timmins, W., Depledge, M.H., Fleming, L.E. and Wheeler, B.W. (2013). Paradigmatic approaches to studying environment and human health: (Forgotten) implications for interdisciplinary research. *Environmental Science & Policy*, 25: 218-228.

PICC. (2012). A Summary of the South African National Infrastructure Plan, Viewed 22 August 2017, From Http://www.Gov.Za/Sites/Www.Gov.Za/Files/PICC_Final.PdfQuinlan, C. (2011). *Business Research Methods*. South-Western Cengage Learning, UK

Pietkiewicz, I. and Smith, J. A. (2014). A practical guide to using interpretative phenomenological analysis in qualitative research psychology. *Czasopismo Psychologiczne*, 18(2), 361–369.

Pillay, P. and Mafini, C. 2017. 'Supply chain bottlenecks in the South African construction industry: Qualitative insights', *Journal of Transport and Supply chain Management*, 11 (0) a, 307. <https://doi.org/10.4102./jtcm.v11i0.307>.

PMI (2013) *A Guide to the Project Management Body of Knowledge*. 5 ed. Newtown Square, Pennsylvania: Project Management Institute.

Portes, A. and Schauffler, R. (1993). Competing perspectives on the Latin American informal sector. *Population and Development Review*, 19(1):33-60.

Pourrostan, T. and Ismail, A. (2011). Significant factors causing and effects of delay in Iranian construction projects. *Australian Journal of Basic and Applied Sciences*, 5(7), 450-456.

Powell, N, Dunwoody, S, Griffin, R and Neuwirth, K. (2007). Exploring uncertainty about an Pretoria: Van Schaik.

PWC, 2014. Highlighting trends in the South African Construction Industry December 2013, 1st edn., South Africa Construction, viewed 20 March 2017, from <https://www.pwc.co.za/en/assets/pdf/saconstruction-december-2013.pdf>

PWC. 2017. SA's emerging companies face a multitude of challenges-but there is room for improvement: PwC report, viewed 21 March 2017, from http://www.pwc.co.za/en/press-room/sa_s-emerging-firms-face-amultitude-of-challenges--but-ther.html

Project Management Institute (PMI), 2013. A guide to the Project Management Body of Knowledge. Project Management Institute.

Project Management Institute (PMI, 2013). A guide to the Project Management Body of Knowledge (PMBOK®) 5th Edition. Newtown Square; Pennsylvania, USA; Project Management Institute.

Psychology, 3(2):77-101. http://eprints.uwe.ac.uk/11735/2/thematic_analysis_revised Date of Access: 02 Oct. 2020.

Pucheta-Martínez, M. C. and Bel-Oms, I. (2018). What have we learnt about board gender diversity as a business strategy? The appointment of board subcommittees. *Business Strategy and the environment*. <https://doi.org/10.1002/bse.2226>.

Punch, K.F. 2014. *Introduction to social research: Quantitative and qualitative approaches*. London: Sage.

Purohit, D.P., Siddiqui, N., Nandan, A. and Yadav, B.P. (2018) Hazard Identification and Risk Assessment in Construction Industry. *International Journal of Applied Engineering Research*, **13**(10), 7639-7667.

PWC (2017). Global Construction 2030: <http://www.pwc.com/gx/en/industries/engineeringconstruction/publications/pwc-global-construction-2030.html>. Accessed 2016/05/01.

Qiu, Y. (2018). Labor Adjustment Costs and Risk Management. *Journal of Financial and Quantitative Analysis*, 54(3), 1447–1468. Available from: doi:10.1017/s0022109018000960

Quinlan, C. (2011). *Business Research Methods*. London: Cengage Learning EMEA.

Rabiee, F. (2004). Focus-group interview and data analysis. *Proceedings of the Nutrition Society*. 63(04):655– 660.

Raga, K. and Taylor, D. (2010) Impact of Accountability and Ethics on Public Service Delivery: A South African Perspective. *Public Manager*, 34, 244-254.

Ramachandra, T., Olabode, J. and Rotimi, B., (2009). The relationship between construction sector and the national economy of Sri Lanka, 1–10.

Rameezdeen, R. (2007). *Image of the construction industry. CIB Priority Theme: Revaluing Construction, A w065'Organization and Management of Construction' Perspective, CIB Publication, 313, 76-87.*

Ratsiepe, K.B. and Yazdanifard, R. (2011). August. Poor risk management as one of the major reasons causing failure of project management. In 2011 International Conference on Management and Service Science (pp. 1-5). IEEE.

Renuka, S.M., Umarani, C. and Kamal, S. (2014). A review on critical risk factors in the life cycle of construction projects. *Journal of Civil Engineering Research*, 4(2A), 31-36. <https://doi.org/10.5923/c.jce.201401.07> Research Report, No. 7.

Rezakhani, P. (2012). Classifying key risk factors in construction Projects. *Buletinul Institutului Politrhnic Din Iasi Construction and Architectural*, LVIII(LXII), Fasc. 2, 2012

Ringen, K., van Duivenbooden, J.C. and Melius, J. (2012). Construction safety and health – Foreword. *American Journal of Industrial Medicine*, 53(6), 551.

Ritchie, B. and Marshall, D. (1993). *Business risk management*. London: Chapman and Hall.

Robson, C. (2002) *Real world research: a resource for social scientists and practitioner - researchers*, Oxford, Blackwell Publishing.

Rogan, M. and Skinner, C. (2018). The size and structure of the South African informal sector 2008–2014 in F. Fourie and C. Skinner (eds). *The South African Informal Sector: Creating Jobs, Reducing poverty*.77-102, HSRC Press. Cape Town.

Rogerson, C. M. (2007). Second Economy Versus Informal Economy: a South African Affair. Editorial, *Geoforum*, 38 (6): 1053–7.

Rogerson, CM, (2004). The Impact of the South African Government’s SMME Programmes: a ten-year review (1994–2003). *Development Southern Africa*, 21(5), 765–84.

Rojas, E and Aramvareekul, P. (2003). Labor Productivity Drivers and Opportunities in the Construction Industry. *Journal of Management in Engineering*. 19(2): 78-82.

Roque, R. and De Carvalho, Y. 2013. The impact of project risk management, assessment of risks on project performance in Brazilian vendor companies. *International Journal of Project Management*, 21(2), pp. 97-105.

Rosazuwad, M. (2010). The factors and effect of delay in government construction project (case study in Kuantan). Universiti Malaysia Pahang.

Rounds, J. and Segner, R.O. (2011). *Construction supervision, completion, risk, and construction company failure*. Hoboken, New Jersey: John Wiley and Sons.

Rowley, J. (2014). Designing and using research questionnaires. *Management Research Review*, 37(3), 308-330.

Rudzani, S. and Manda, D.C. (2016). 'An assessment of the challenges of adopting and implementing IFRS for SMEs in South Africa', *Problems and Perspectives in Management*, 14(2), 212-221.

Rule, P. and John, V. (2011). *Your Guide to Case Study Research*. Pretoria: Van Schaik Publishers

Salah, A. and Moselhi, O. (2016). Risk identification and assessment for engineering procurement construction management projects using fuzzy set theory, *Canadian Journal of Civil Engineering*, 43, 429-42.

Salkind, N. J. (2015). *Exploring research* 8th Ed. New Jersey: Pearson Education, INC.

Sapsford, R. and Jupp, V. (2006). *Data collection and Analysis*. 2nded. New Delhi: Sage Publications, Ltd.

Sarantakos, S. (2013). *Social Research*. 4th ed. United Kingdom, United Kingdom: Palgrave Macmillan.

Saunders, M., Lewis, P. and Thornhill, A. (2016). *Research methods for business students*. Seventh edition. Edinburgh Gate: Pearson Education.

Saunders, M.N.K., Lewis, P. and Thornhill, A. (2009). *Research Methods for Business Students*, 5th edition, Harlow: Pearson Education Limited.

Saunders, S.G. (2005). *Estimates of the informal economy in South Africa: Some macroeconomic policy implications*. Department of Economics, University of Johannesburg. Phd- thesis.

Sawhney, A., Walsh, K. D. and Brown IV, A. (2004). International Comparison of Cost for the Construction Sector: Towards a Conceptual Model, *Civil Engineering and Environmental Systems*, 21 (3) 151 – 167.

SBP. (2011). *Smaller Firms are the Primary Drivers of Job Growth*, Headline Report of SBP's SME Growth Index, Johannesburg, South Africa.

Schieg, M. (2010). 'Risk management in Construction Project Management', *Journal of Business Economics and Management* 7(2), 77-83.

Schieg, M. (2006). Risk management in construction project management. *Journal of Business Economics and Management*, (2): 77-83.

Schneider, F. (2002). *Size and measurement of the informal economy in 110 countries around the world*. Washington, D.C.: World Bank.

Schwartz-Shea, P. and Yanow, D. (2012). *Interpretive research design. Concepts and processes*, Routledge Publication, University of Amsterdam and Wageningen University of New York.

Sears, G. A., Sears, S. K. and Clough, R. H. (2015). *Construction project management (6th ed.)*. Somerset, US: John Wiley & Sons, Incorporated.

Sekaran, U. and Bougie, R. (2019). *Research Methods for Business: A Skill Building Approach*. John Wiley & Sons.

Sekaran, U. and Bougie, R. (2016). *Research methods for business*. 5th ed. West Sussex: John Wiley and Sons Ltd.

Sewell, M. (2006). The use of qualitative interviews in evaluation. The University of Arizona. <https://cals.arizona.edu/sfcs/cyfernet/cyfar/Intervu5.htm>. Date of access: 05 May 2021.

Shook, C., Adams, G., Ketchen, D. Jr, and Craighead, C. (2009), "Towards a 'theoretical toolbox' for strategic sourcing", *Supply Chain Management: An International Journal*, 14 (1), 3-10

Shpak N, Sorochak O, Hvozď M and Sroka W. (2018). Risk evaluation of the reengineering projects: a case study analysis. *Scientific Annals of Economics and Business* 65(2):215-226. (DOI:10.2478/saeb-2018-0014; downloaded on 19 March 2019.)

Shunmugam, S. and Rwelamila, P.P. (2015). An evaluation of the status of risk management in South African construction projects, proceedings of the Project Management South Africa (PMSA) conference 2014, ISBN: 978-0- 620-64562-1, 29-30 September and 01 October 2014.

Simon, M. (2011). *Analysis of qualitative data: Dissertation and scholarly research recipes for success*, viewed 05 May 2016, from <http://dissertationrecipes.com/wp-content/uploads/2011/04/Analysis-of-Qualitative-DataXY.pdf>

Singh, K. (2007). *Quantitative social research methods*. New Dehli: Sage Publications, Inc.

Singh, Y. (2007). "Fundamental of Research Methodology and Statistics". New Delhi: New Age International Publishers.

Sitharam, S. and Hoque, M. (2016). 'Factors affecting the performance of small and medium enterprises in KwaZulu-Natal, South Africa', *Problems and Perspectives in Management* 14(2), 277-288, viewed 15 October 2019, from <https://pdfs.semanticscholar.org/32f1/97d075b84feb0f0ac7f9c98bfb25ccc7c358.pdf>.

Skinner, C. (2005). *Constraints to Growth and Employment in Durban: Evidence from the Informal Economy*. Research Report #65, School of Development Studies, University of KwaZulu-Natal.

Smallwood, J.J. and Emuze, F.A. (2012). 'Status of quality in South African construction: The case of a general contractor', in Proceedings of the 6th international conference and workshop on the built environment in developing countries (ICBEDC-2012), Adelaide, Australia, December 4(5): 113–124.

Smith, J. A. and Osborn, M. (2007). Interpretative phenomenological analysis. In Smith, J. A. (Ed.), *Qualitative psychology: A practical guide to research methods*. London: Sage.

Smith, J. A., Flowers, P. and Larkin, M. (2012). *Interpretative phenomenological analysis: Theory, method, and research*. London: Sage.

Sobottka E. A. (2016). Commitment and regulation. Ethics in research and the human sciences International Journal of Action Research, 12 (2): 116-143

Standing, G.J., Sender, J. and Weeks, J. (1996). *Restructuring the Labour Market: The South African Challenge*. Geneva: ILO.

Stangor, C. (2011). *Research Methods for the Behavioral Sciences*, 4th ed. Belmont:

Statistics South Africa. (2014). Report for the South African informal sector. Pretoria: StatsSA.

Statistics South Africa. (2015). *Quarterly Labour Force Survey*. Pretoria: StatsSA.

Statistics South Africa. (2011). *Statistical release: Quarterly Labour Force Survey*. Pretoria: Statistics South Africa.

Statistics South Africa. (2013). *A survey of time use 2010*. Pretoria: Statistics South Africa.

Strydom, H. 2013a. Ethical aspects of research in the social sciences and human service professions. (In De Vos, A.S., Strydom, H., Fouché, C.B. & Delpont, C.S.L. Research at grass roots for the social sciences and human service professions. 4th ed. Pretoria: Van Schaik. 113-129).

Subramani, T., Sruthi, P.S. & Kavitha, M. 2014. Causes of cost overrun in construction. *IOSR Journal of Engineering (IOSRJEN)*, 4(6): 2278- 8719. <https://doi.org/10.9790/3021-04640107>

Szymanski, P. (2017). Risk management in construction projects. *Procedia Engineering*, 208, 174-182. doi:<https://doi.org/10.1016/j.proeng.2017.11.036>

Tadayon, M., Jaafar, M. and Nasri, E. (2012) An Assessment of Risk Identification in Large Construction Projects in Iran. *Journal of Construction in Developing Countries*, 1, 57-69.

Tang, W., Qiang, M., Duffield, C., Young, M., & Lu, Y. (2007). Risk management in the Chinese construction industry. *Journal of Construction Engineering and Management*. 133(12), 944-955.

Tang, Y.H and Ogunlana, S.O. 2013. Modelling the dynamic performance of a construction organization, *Journal of Construction Management and Economics*, vol. 21, no. 2, pp.127-136.

Taroun, A. (2014) Towards a better modelling and assessment of construction risk: Insights from a literature review. *International Journal of Project Management*, 32 (1), 101-115.

Taroun, A., Yang, J. and Lowe, D. (2011) Construction risk modelling and assessment: Insights from a literature review. *The Built and Human Environment Review*.

Theodore, N., Blaauw, D., Schenck C., Valenzuela Jr., A., Schoeman, C. & Meléndez, E. 2015. “Day labor, informality and vulnerability in South Africa and the United States”, *International Journal of Manpower*, 36(6): 807–823.

Thurlow, J. and Davies, R. 2009. *Informal-Formal economy linkages and unemployment in South Africa*.

Tipili, G.L. and Iiyasu, M.S. (2014) Evaluating the Impact of Risk Factors on Construction Projects Cost in Nigeria. *The International Journal of Engineering and Science*, 3, 10-15. <http://pmworldjournal.net/>

Tipple, G. (2005). The Place of Home-based Enterprises in the Informal Sector: Evidence from Cochabamba, New Delhi, Surabaya, and Pretoria. *Urban Studies*, 42(4), 611-632.

Tissington, K. (2009). The business of survival: Informal trading in inner city Johannesburg. Centre for Applied Legal Studies (CALS) http://web.wits.ac.za/NR/rdonlyres/4376D73D-E127-4C14-A579-1C61F681AF70/0/CALS_BusinessofSurvival_Dec09.Pdf. Town: Van Schaik Publishers.

Tserng, H.P., Yin, S.Y.L., Dzen, R.J., Wou, B., Tsai, M.D., & Chen, W.Y. (2009). *Automation in Construction*, 18(2009), 994-1008.

Tummala, R. and Schoenherr, T. (2011). Assessing and managing risks using the Supply Chain Risk Management Process (SCRMP). *Supply Chain Management: An International Journal*, 16 (6), 474-483.

Uys, M.D. & Blaauw, P.F. 2006. The dual labour market theory and the informal sector in South Africa. *Acta Commercii*, 6(1):248-257.

Valodia, I., Davies, R., Altman, M. & Thurlow, J. (2007). Economic Behaviour in South African's Informal Economy. Report to the conflict and governance facility (CAGE). Pretoria: Human Sciences Research Council.

Valsamakis AC, Dutoit GS. & Vivian RW. 2013. Risk management. 5th ed. Pretoria: Pearson Education.

Vehovar, V., Toepoel, V. and Steinmetz, S. (2016) Non-Probability Sampling. In: Wolf, C., Joye, D., Smith, T. and Fu, Y.C., Eds., *The SAGE Handbook of Survey Methodology*, SAGE Publications Ltd, New York, 329-345. <https://doi.org/10.4135/9781473957893.n22>

Verbano, C. and Venturini, K. (2011) Development paths of risk management: approaches, methods and fields of application. *Journal of risk research*, **14**(5), 519-550.

Vidivelli, B, Vidhyasagar, E and Jayasudha, K (2017) Risk analysis in bridge construction projects, *International Journal of Innovative Research in Science, Engineering and Technology*, 6(5), 8271-8284.

Viljoen, J.M.M. 2014. Economic and social aspects of street waste pickers in South Africa. Unpublished PhD thesis, Department of Economics and Econometrics. Johannesburg: University of Johannesburg.

Vithal, R. and Jansen, J. 2020. Designing your first research proposal: a manual for researchers in education and the social sciences. Somerset West: Juta & Company. Wadsworth, Cengage Learning. London: Sage.

Vollmer, A. 2015. Conflicts in innovation and how to approach the “last mile” of conflict management research – A literature review. *International Journal of Conflict Management*, 26(2), 192-213.

Walewski, J., Gibson, G. E., and Vines, E. F., Risk Identification and Assessment for International Construction Projects, In D. I. Cleland, & R. Gareis, *Global Project Management Handbook*, 1-17, McGraw-Hill, New York, 2006.

Wang, J. & Yuan, H. (2011). Factors affecting contractors' risk attitudes in construction projects: Case study from China. *Science Direct: International Journal of Project Management*, 29, 209- 219.

Wang, S. Q., Dulaimi, M. F. and Aguria, M. Y. (2004). Risk management framework for construction projects in developing countries, *Construction Management and Economics*, 22, 237-52.

Warszawski, A. and Sacks, R. (2004). Practical Multifactor Approach to Evaluating Risk of Investment in Engineering Projects, *Journal of Construction Engineering and Management*, 130(3), 357-367.

Watson, V. (2002). The Usefulness of Normative Planning Theories in the Context of Sub-Saharan Africa. *Planning Theory*, 1(1), 27-52.

Watson, V. (2009). Seeing from the South: Refocusing Urban Planning on the Globe's Central Urban Issues. *Urban Studies*, 46(11), 2259–2275.

Watson, V. (2009). The Planned City Sweeps the Poor Away: Urban Planning and 21st Century.

Watson, V. (2011). Inclusive Urban Planning for the Working Poor: Planning Education Trends and Potential Shifts. *WIEGO Working Paper (Urban Policies) No. 21*. WIEGO.

Welman, C., Kruger, F. and Mitchell, B. (2005). *Research Methodology*. (3rd ed.). Oxford: Oxford University Press.

Wiguna, I., Scott, S. and Khosrowshahi, F. (2005). Nature of the critical risk factors affecting project performance in Indonesian building contracts. In: 21st Annual ARCOM Conference, SOAS, University of London, Association of Researchers in Construction Management, 225-35

Williams, Colin C. and Mark Lansky. (2013). "Informal Employment in Developed and Developing Economies: Perspectives and Policy Responses." *International Labour Review*, 152 (3-4), 355-380.

Wills, G. (2009). *South Africa's informal economy: A statistical profile*. Wiego: Urban Policies

Wilson, R. L. (1982). Prevention and resolution of construction claims. *Journal of the Construction Division*, 108(3), 390-405.

Wilson, T.D. 2011. Introduction: Approaches to the informal economy. *Urban Anthropology*, 40(4):206-221.

Wimmer, R. D. and Dominick, J. R. (2012). *Mass media research* (7th. ed.). New York: Cengage Learning.

Windapo, A. and Martins, O. (2010) An investigation into Nigerian property construction companies' perception of critical risk. *Insurance Markets and Companies*, 1(1), 78 - 83.

Windapo, A.O and Cattell, K. (2013). The South African Construction Industry: Perceptions of key challenges facing its performance, development and growth. *Journal of Construction in Developing Countries*, 18(2): 65-79.

Wisdom, J. and Creswell, J. W. (2013). Mixed methods: Integrating qualitative and quantitative data collection and analysis while studying patients-centred medical home model. <https://pcmh.ahrq.gov/page/>.

World Bank. (2013). South Africa: national resource issues in environmental policy. Washington DC: The World Bank.

Wyse, S. (2011). *Difference between Qualitative Research vs. Quantitative Research*. [online] Snap Surveys Blog. Available at: <<http://www.snapsurveys.com/blog/what-is-the-difference-between-qualitative-research-and-quantitative-research/>> [Accessed 29 November 2020].

Xiaopeng, D. and Pheng, L.S. (2013). Understanding the critical variables affecting the level of political risks in international construction projects. *KSCE, Journal of Civil Engineering*, 17(5), 895-907, <https://doi.org/10.1007/s12205-013-0354-5>.

Xu, Y., Yeng, J.F.Y., Chan, A.P.C., Chan, D.W.M., Wang, S.Q. and Ke, Y. (2010). Developing a risk assessment model for PPP projects in China-a fuzzy synthetic evaluation approach. *Automation in Construction*, 19(7), 929-943. <https://doi.org/10.1016/j.autcon.2010.06.006>

Yamane, T. (1967) *Statistics: An Introductory Analysis*. 2nd Edition, Harper and Row, New York.g

Yan J. and Oum T. H. (2014). "Effects of Government Corruption on the Efficiency of U.S. Commercial Airports", *Journal of Urban Economics*, 80, 119-132.

Yu, D. (2012). *Defining and measuring informal employment in South Africa: A review of recent approaches*. Stellenbosch Economic Working Papers: 09/10. Stellenbosch: Stellenbosch University.

Yusof, N.A., Abidin, N.Z., Zailani, S.H.M., Govindan, K. and Iranmanesh, M. (2016), "Linking the environmental practice of construction firms and the environmental behaviour of practitioners in construction projects", *Journal of Cleaner Production*, (121)64-71.

Zaneldin, E.K. (2006), "Construction claims in United Arab Emirates: types, causes, and frequency", *international*", *Journal of Project Management*, (24):5,453-9

Zarrouk, H., Ghak, T. E. and Haija, E. A. A. (2017). Financial development, Islamic finance, and economic growth: Evidence of the UAE. *Journal of Islamic Accounting and Business Research*, 8(1), 2-22. doi: <http://dx.doi.org/10.1108/JIABR-05-2015-0020>.

Zavadskas, E.K., Turskis, Z. and Tamošaitiene, J. (2010). Risk assessment of construction projects. *Journal of Civil Engineering and Management*, 16(1): 33-46.

Zhao, Z. Y., Lv, Q.L., Zuo, J. and Zillante, G. (2010). Prediction system for change management in construction projects. ASCE, *Journal of Construction Engineering and Management*, 136(6), 659-669.

Zhu, W., Chew, I. K. H. and Spangler, W. D. (2005). CEO transformational leadership & organizational outcomes: The mediating role of human-capital-enhancing human resource management. *The Leadership Quarterly*, 16(1), 39-52. <http://dx.doi.org/10.1016/j.leaqua.2004.06.001>.

Zikmund, W.G. and Babin, B. J. (2010). *Exploring marketing research*. 10th ed. China: Southwestern Cengage Learning.

Ziyu, W., Tahir, N., Dharm, K. and Guru, P. (2017). Risk factors for project success in the Chinese construction industry. *Journal of Manufacturing Technology Management*, 28(7), 850-866. doi:10.1108/JMTM-02-2017-0027

Zou, P. X. W, Zhang, G. and Wang, J. (2017). ‘Understanding the key risks in construction projects in China’, *International Journal of Project Management* (25), 601-614.

Zou, P.X.W., Zhang G. and Wang, J. (2011). Understanding the key risks in construction projects in China. *International Journal of Project Management*, 25(2007), 601-614. <https://doi.org/10.1016/j.ijproman.2007.03.001>.

QUESTIONNAIRES

Dear participants,

The researcher Mr Kelehile Joseph Motlhale designed the questionnaire. The questionnaire represents one of the critical tools for the completion of the survey requirements of PhD in Business Administration at the Durban University of Technology (DUT). This empirical study investigates “*Risk factors influencing informal contractors in the construction industry in selected municipalities in the Free State Province, South Africa*”. Primary data collected

through the questionnaire will be analysed and further recommendations based on the research outcomes will be implemented to assist informal contractors to improve, minimise the nature of risks in the construction industry. Kindly complete the questions with honesty and high objectivity. Great care will be taken to treat the final data provided. Data confidentiality and other related information is of utmost importance and for the purpose of this study. For queries regarding the questionnaires, please don't hesitate to contact the researcher or the supervisor.

Contact details: **Supervisor:** alberta@dut.ac.za **Researcher:** Joseph Motlhale
<hapsm@yahoo.com>

SECTION A

Personal information

1. (a) Owner-contractor (b) Employee contractors
2. Sex: (a) Male (b) Female
3. What is the level of education?
(a) Matric (b) Below matric (c) Tertiary (d) No education (e) Vocational education
4. Age group: (a) 20-25 years (b) 25-30 years (c) 35-40 years (d) 40-50 years (e) 50-60 years
(f) 60-70+ years
5. Are you married? (a) Married (b) Single (c) Divorced

SECTION B

General information

1. Is the business registered? (a) Yes (b) No
2. If not registered, provide the reason (s).....
.....
3. How long have you worked as a contractor? (a) 5 years (b) Over 5 years (c) Under 10 years
(d) 10 years (e) over 10 years
4. How did you become a contractor in the industry? (a) On the job training (b) Skills training programme
5. Do you acquire knowledge about risk management (if yes, please specify) (a) No (b) Yes
6. Years of experience. (a) under 5 years (b) over 5 years (c) under 10 years (d) over 10 years (e) over 20 years.

SECTION C

The aim of this section is to identify *risk factors* that impact on activities of informal contractors in the construction industry.

Kindly select the correct level of impact of each risk factors based on your perspective.

1	2	3	4	5
0-20% No effect	25-45% Minimum	50-60% Moderate	65-75% Significant	80-100% Extensive

Management factors:

	1	2	3	4	5
1. Decision making procedures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Communication with shareholders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. The presence of representatives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Sharing information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Contracting experiences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Competency as a contractor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Conflict resolution platforms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Quality control measures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION D

On a scale of 1-5 what is the likelihood of occurrence of each of the factors below:

1	2	3	4	5
Not likely	Least likely	Less likely	Likely	Most likely

Management factors:

	1	2	3	4	5
1. Decision making procedures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Communication with shareholders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. The presence of representatives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Sharing information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Contracting experiences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Competency as a contractor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Conflict resolution platforms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Quality control measures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION E

The aim of this section is to identify *risk factors of design* that impact on activities of informal contractors in the construction industry.

Kindly select the correct level of impact of each risk factors based on your perspective.

1	2	3	4	5
1-20% No effect	21-40 Minimum	41-50% Moderate	51-80% Significant	81-100% Extensive

Factors of project design

	1	2	3	4	5
1. Experience in design tasks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. Nature of project design	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Design nature unclear and confusing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Clearer project documentation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Design modification of documents	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Information gathering before design	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Clear drawing of projects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION F

The aim of this section is to identify which of the risk factors occur most frequently.

On a scale of 1-5 what is the likelihood of occurrence of each of the factors below:

1	2	3	4	5
Not likely	Least likely	Less likely	Likely	Most likely

Factors of project design

	1	2	3	4	5
1. Experience in design tasks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Nature of project design	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Design nature unclear and confusing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Clearer project documentation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Design modification of documents	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Information gathering before design	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Clear drawing of projects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION G

The aim of this section is to identify *risk factors of finances* that impact on activities of informal contractors in the construction industry.

Kindly select the correct level of impact of each risk factors based on your perspective.

1	2	3	4	5
1-20% No effect	21-40% Minimum	41-50% Moderate	51-80% Significant	81-100% Extensive

Risks of financing

	1	2	3	4	5
1. Completed work paid for	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Funding projects by contractors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Levels of cash flow analysis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Estimate of cost accuracy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION H

The aim of this section is to identify which of the risk factors occur most frequently.

On a scale of 1-5 what is the likelihood of occurrence of each of the factors below:

1	2	3	4	5
---	---	---	---	---

Not likely	Least likely	Less likely	Likely	Most likely
------------	--------------	-------------	--------	-------------

Risks of financing	1	2	3	4	5
1. Completed work paid for	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Funding projects by contractors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Levels of cash flow analysis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Estimate of cost accuracy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION I

The aim of this section is to identify *risk factors of materials* that impact on project qualities/completion by contractors in the construction industry.

Kindly select the correct level of impact of each risk factors based on your perspective.

1	2	3	4	5
1-20% No effect	21-40% Minimum	41-50% Moderate	51-80% Significant	81-100% Extensive

Factors relating to materials	1	2	3	4	5
1. Enough materials for construction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Material quality sub-standard	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Material changes during construction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Challenges of material suppliers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Handling materials wastages	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Material compliance by contractors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Materials delivery by suppliers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION J

The aim of this section is to identify which of the risk factors occur most frequently.

On a scale of 1-5 what is the likelihood of occurrence of each of the factors below:

1	2	3	4	5
Not likely	Least likely	Less likely	Likely	Most likely

Factors relating to materials	1	2	3	4	5
1. Enough materials for construction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Material quality sub-standard	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Material changes during construction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Challenges of material suppliers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Handling materials wastages	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Material compliance by contractors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Materials delivery by suppliers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION K

The aim of this section is to identify the effect of *risk factors relating to project equipment by contractors during the construction activities.*

Kindly select the correct level of impact of each risk factors based on your perspective.

1	2	3	4	5
1-20% No effect	21-40% Minimum	41-50% Moderate	51-80% Significant	81-100% Extensive

Project equipment

	1	2	3	4	5
1. Availability of contracting equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Efficiency of equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Knowledge of equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Servicing and warranties of equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION L

The aim of this section is to identify which of the risk factors occur most frequently.

On a scale of 1-5 what is the likelihood of occurrence of each of the factors below:

1	2	3	4	5
Not likely	Least likely	Less likely	Likely	Most likely

Project equipment

	1	2	3	4	5
1. Availability of contracting equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Efficiency of equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Knowledge of equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Servicing and warranties of equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION M

The aim of this section is to identify risk factors that are related to labour and the impact on activities of the contractors in the construction industry.

Kindly select the correct level of impact of each risk factors based on your perspective.

1	2	3	4	5
1-20% No effect	21-40% Minimum	41-50% Moderate	51-80% Significant	81-100% Extensive

Labour in the construction industry

	1	2	3	4	5
1. Performance by labour	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Conditions of labour in the industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- 3. Related skills of contractors
- 4. Productivity of quality products
- 5. Labour disputes/during strikes
- 6. Contractors' labour sub-standard

SECTION N

The aim of this section is to identify which of the risk factors occur most frequently.

On a scale of 1-5 what is the likelihood of occurrence of each of the factors below:

1	2	3	4	5
Not likely	Least likely	Less likely	Likely	Most likely

Labour in the construction industry

- | | 1 | 2 | 3 | 4 | 5 |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Performance by labour | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Conditions of labour in the industry | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Related skills of contractors | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Productivity of quality products | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Labour disputes/during strikes | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Contractors' labour sub-standard | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION O

The aim of this section is to identify *risk factors of the external environment that impacts project qualities/completion* by contractors in the construction industry.

Kindly select the correct level of impact of each risk factor based on your perspective.

1	2	3	4	5
1-20% No effect	21-40% Minimum	41-50% Moderate	51-80% Significant	81-100% Extensive

External environment

- | | 1 | 2 | 3 | 4 | 5 |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Public disorder and civil disruptions | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Problems with competitors | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Permission by local authorities | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Changes in local legislations | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Interferences by stakeholders | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Weather conditions | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Political interferences | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION P

The aim of this section is to identify which of the risk factors occur most frequently.

On a scale of 1-5 what is the likelihood of occurrence of each of the factors below:

1	2	3	4	5
Not likely	Least likely	Less likely	Likely	Most likely

External environment

	1	2	3	4	5
1. Public disorder and civil disruptions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Problems with competitors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Permission by local authorities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Changes in local legislations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Interferences by stakeholders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Weather conditions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Political interferences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Thanks so much for your support

INTERVIEW SCHEDULE

TOPIC: Risk factors influencing informal contractors in the construction industry in selected municipalities in the Free State Province, South Africa

- What is your present profession?
(a) Architect (b) Quantity Surveyor (c) Civil engineer (d) Others
- For how long have you been employed in the construction industry?
(a) 1-5 years (b) 6-10 years (c) 11-15 years (d) 16-20 years
- What level of skill did you acquire in the construction industry? If yes; Name, the skill

- What form of risk you experienced in the industry over the years? Yes No
Yes, please state the form of risk -----

5. What is your level of knowledge in risk in the construction industry? Indicate whether risk is high or low in the industry.-----
6. Does your company conduct any form of risk management in the industry?
- 6.1 State the type of risk conducted: -----

7. In what ways does the risk impact your industry?
8. Identify any ways you think the construction industry can be sustained to grow.

Thanks so much for your support

M. LINSTRÖM
LANGUAGE PRACTITIONER

5 October 2023

DECLARATION OF EDITING

I, Margaret Linström, hereby confirm that I edited Kelehile Joseph Motlhale's doctoral thesis.

The editing was done electronically, using Track Changes, to enable the candidate to accept or reject the suggested changes, thus retaining his authorial discretion and right to assert authorship.



Mr. Kelehile J Motlhale
421 Long Road
Doorn
WELKOM
9459

**REQUEST FOR PERMISSION TO EMPIRICAL RESEARCH STUDY
FOR PHD (STUDENT NO: 21650120)**

Your email dated 25th September 2022 pertaining to the above subject matter, bears reference.

Permission herewith granted to your good self to gather field data from the Informal small contractors across the selected local and district municipalities within the Free State, in preparation of your empirical research study.

As mentioned in your aforementioned email, the data to be collected is strictly confidential and it should thus be utilized only for your research purposes.

I am of the personal view that such research will be beneficial to both the informal small contractors as well as to the government, as it will give a much clearer of the situation regarding small contractors across municipalities and the province at large.

In the process it will assist municipalities and provincial, and even national government in planning better and ensuring that such informal small contractors are empowered accordingly to avoid any risks they may run into, which may be detrimental to them and the government as well.

I trust that you find the above in order and wish you luck in your studies.

Regards,

MR STR RAMAKARANE
HOD: COGTA FREE STATE

27/09/2022
DATE



Zertifikat

Certificado

Certificat

Certificate

Promouvoir les plus hauts standards éthiques dans la protection des participants à la recherche biomédicale Promoting the highest ethical standards in the protection of biomedical research participants



Certificat de formation - Training Certificate

Ce document atteste que - this document certifies that

Kelehile Motlhale

a complété avec succès - has successfully completed

Introduction to Research Ethics

du programme de formation TRREE en évaluation éthique de la recherche
of the TRREE training programme in research ethics evaluation

Release Date: 2021/09/14
CID : xjD1GD4Nzn

Professeur Dominique Sprumont
Coordinateur TRREE Coordinator



Ce programme est soutenu par - This program is supported by :

European and Developing Countries Clinical Trials Partnership (EDCTP) (www.edctp.org) - Swiss National Science Foundation (www.snf.ch) - Canadian Institutes of Health Research (<http://www.cihr-irac.gc.ca/N2991.html>) -

Swiss Academy of Medical Sciences (SAMMS/SAMMS) (www.samms.ch) - Commission for Research Partnerships with Developing Countries (www.hpa.ch)

[REV : 20170310]

Thesis

ORIGINALITY REPORT

5%

SIMILARITY INDEX

4%

INTERNET SOURCES
STUDENT PAPERS

3%

PUBLICATIONS

1%

PRIMARY SOURCES

II

research.bond.edu.au

Internet Source

1%



Ferede, Yisakor Solomon.
"Assessment of Risk Management
in Ethiopian Construction Industry",
University of Johannesburg (South
Africa), 2021

Publication

1%

II

pure.manchester.ac.uk

Internet Source

<1%



researchspace.ukzn.ac.za

Internet Source

<1%

II

epress.lib.uts.edu.au

Internet Source

<1%



Saunders, Stephen Graham.

<1%

"Estimates of the Informal
Economy in South Africa: Some
Macroeconomic Policy
Implications.", University of
Johannesburg (South Africa), 2021
Publication



www.virtusinterpress.org

Investigating the Impact of Built Environment Skills Set Levels on Construction Project Delivery in South Africa: As Experienced in Rural Municipalities of the Free State", University of Johannesburg (South Africa), 2023

Publication

Submitted to University of West London



Student Paper

<1%

wiredspace.wits.ac.za



Internet Source

<1%



cpb-us-e1.wpmucdn.com

Internet Source

<1%

Submitted to Tshwane University of Technology



Student Paper

<1%

www.urbanlandmark.org.za



Internet Source

<1%
