

Pension Fund Investment and Infrastructure Development in Namibia

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ABSTRACT

Developing countries, such as Namibia, need to bridge the existing infrastructure gap to improve the country's comparative advantage, economic growth and competitiveness, quality of life and the welfare of its citizens. As traditional sources of finance dwindle, Pension Fund savings need to be pooled to complement traditional sources of funding, such as government budgetary allocations, borrowing and user fees. Although infrastructure's economic and financial characteristics are a match to Pension Fund liabilities, Namibia's Pension Fund investment in infrastructure lags behind world-class benchmarks. This study investigated the factors that hinder Pension Fund investment in infrastructure in Namibia. The study employed a mixed-method research method and convergent parallel data collection processes. The study obtained a representative sample to participate in the survey from a population of NAMFISA registered Pension Fund and investment managers using a combination of the stratified random and simple random sampling techniques as part of primary data collection.

The financial characteristics that make infrastructure assets attractive such as; long term, low sensitivity to economic swings, a low correlation with other assets and long term and inflation hedged returns makes them suitable for Pension Fund investments. The study confirms findings of previous studies by Beeferman, (2008); Ehlers, (2014); Inderst & Della Croce, (2013); Sy, (2017) and Thierie & Moor (2016), amongst others, revealed factors such as; a lack of a project pipeline, a lack of expertise by Pension Funds in infrastructure investments, Pension Fund regulation and a lack of financial instruments and assets that match Pension Funds are barriers to Pension Fund investment in infrastructure. The lack of a project pipeline is further attributable to issues such as infrastructure projects that are not sufficiently developed or viable on their own without some form of government support, inefficiencies in public procurement and public-private partnership policies and a lack of project preparation funding.

The study recommends the following initiatives by policymakers and key stakeholders towards increasing Pension Fund investment in infrastructure: firstly, government and state-owned institutions responsible for public services should implement policies that will increase the pipeline of bankable and implementable projects. The National Development Plans (NDP5), the Harambee Prosperity plans and the Vision 2030 already identify projects; however, institutions tasked with infrastructure development need to develop implementation models that are viable and bankable. The development plans need to be coordinated across the various levels

of government and state-owned enterprises for effective implementation. Secondly, it is recommended that policymakers create the necessary conditions for Public Procurement and Public Private Partnership Policies to gain confidence amongst investors. Rooting out corruption and ensuring processes are transparent and fair to all stakeholders can have the effect of creating investor confidence in the two policies. The financial institutions, especially with a developmental angle, should support the public institutions with project preparation funding and technical assistance during project planning/development. Thirdly, the government, through the regulators, NAMFISA, are advised to continue with the implementation of policies aimed at increasing the limit on assets held with unlisted investment managers to allow increased Pension Fund investment in infrastructure without compromising the performance (return) and risk exposure. The financial regulators, NAMFISA and the Bank of Namibia should encourage the growth of the local financial sector to increase the quality and quantity of financial instruments available to investors and increase the depth of the financial sector to absorb local funding capacity. Lastly, the government is recommended to explore the options of partial listing infrastructure SOEs, such as NamPower, NamWater, Road Fund Administrator (RFA), NamPort, TransNamib, among others, to facilitate Pension Fund investment into infrastructure and reduce transaction cost and risks.

The study identifies the need for future research opportunities with the aim of understanding issues that affect the project pipeline in the Namibian context in greater detail.

TABLE OF CONTENTS

PLAGIARISM DECLARATION	i
ABSTRACT	ii
TABLE OF CONTENTS	iv
LIST OF FIGURES	vi
LIST OF TABLES	vi
ACKNOWLEDGEMENTS	viii
GLOSSARY OF TERMS	ix
CHAPTER 1: Introduction.....	1
1.1 Background	1
1.2 Problem Statement	3
1.3 Research Questions	4
1.4 Research Objectives	5
1.5 Justification of the study.....	5
1.6 Limitation of the Study.....	6
1.7 Structure of the Study.....	6
CHAPTER 2: A literature review	8
2.1 Introduction	8
2.2 Overview of the Pension Fund Industry in Namibia	8
2.3 Infrastructure Development and Financing in Namibia	13
2.4 The literature on Infrastructure as an asset class	16
2.4.1 Definition of Infrastructure.....	16
2.4.2 Characteristics of infrastructure as an Asset Class	16
2.4.3 Financial instruments	20
2.4.4 Risk-Return Profiles	24
2.5 Pension Fund Investment Models into infrastructure Projects	29
2.5.1 Comparison between the Canadian and Australian model	29
2.5.2 Barriers to Pension Fund investments	31
2.6 Summary of the Chapter.....	35
CHAPTER 3: Research methodology.....	37
3.1 Introduction	37
3.2 Research Approach.....	37
3.3 Unit of analysis, population, sampling technique and sample size	38
3.4 Data collection process.....	39
3.5 Data Analytical Framework	40

3.6	Validity and reliability.....	41
CHAPTER 4: Findings and data analysis		43
4.1	Introduction	43
4.2	Profile of Respondents	43
4.3	Factor Analysis Results	43
4.4	Pension Fund attitudes toward Infrastructure as an asset class	45
4.5	Factors hindering Pension Fund investment in infrastructure	48
4.5.1	Lack of project pipeline.....	48
4.5.2	Financial Instruments	51
4.5.3	Investment too risky	60
4.5.4	Lack of expertise/understanding of infrastructure assets	60
4.5.5	Alignment in Investment Strategies	62
4.6	Impact of Pension Fund Regulation on Infrastructure investing	63
CHAPTER 5: Conclusions and recommendations.....		65
5.1	Introduction	65
5.2	Pension Funds attitudes towards investment in infrastructure in Namibia.....	68
5.3	Factors hindering Pension Fund Investment in Infrastructure.....	65
5.4	Pension Fund Regulation.....	69
5.5	Recommendations for Future Research.....	70
REFERENCES		71
Appendix A1: Questionnaire Pension Fund Investment in Infrastructure (Pension Funds		76
Appendix A2: Questionnaire Pension Fund Investment in Infrastructure (Pension Funds		82
Appendix B: Registered Investment Managers.....		88
Appendix C: Registered Unlisted Investment Managers (UIMs)		89
Appendix D: Registered Pension Fund and Friendly Societies		90
Appendix E: Summary of survey responses from Investment Managers respondents		95
Appendix F: Summary of survey response from Pension Funds respondents		100
Appendix G: Investment Manager Response Coded Data.....		106
Appendix H: Pension Fund survey response Likert Coded Data.....		109

LIST OF FIGURES

Figure 1: Current Railways Network in Southern Africa	3
Figure 2: Research focus and Limitations	6
Figure 3: Pension Fund Investment Landscape.....	10
Figure 4: Infrastructure Exposure to cash flow risk and economic cycle	18
Figure 5: Infrastructure correlation with other asset classes	19
Figure 6: Infrastructure Financing Vehicles.....	21
Figure 7: Preferred Financial Instrument	23
Figure 8: Risk-Return spectrum	24
Figure 9: Project life cycle risks and asset value	28
Figure 10: Risk Allocation and Transfer in PPP Projects	33
Figure 11: Barrier – questionnaire enquiry linkages	40
Figure 12: Infrastructure investment J-curve	59

LIST OF TABLES

Table 1: NDP4 Funding Plan	2
Table 2: Allocation per asset class Q2 and Regulation 28 Limits	11
Table 3: Pension Fund Asset held in each region	12
Table 4: Public Entities Responsible For Infrastructure Development.....	13
Table 5: Unlisted Investment Managers with GIPF Mandates	15
Table 6: Common forms of infrastructure investment	25
Table 7: Unlisted infrastructure performance: June 2009.....	27
Table 8: Respondent Profiles	43
Table 9: Factor Analysis Results Summary	45
Table 10: Kaiser-Meyer-Olkin Result for individual respondents.....	45
Table 11: Factor Score and Descriptive Statistics for “Attitude towards infrastructure as a unique asset class with distinct economic and financial characteristics?” variable.....	46
Table 12: Factor Score and Descriptive Statistics for “Infrastructure's financial and economic characteristics” variables	46
Table 13: Factor Score and Descriptive Statistics for “Infrastructure features that are not attractive to investors” variables	47
Table 14: Factor Score and Descriptive Statistics for “Steady stream of bankable infrastructure projects/opportunities” variable.....	48
Table 15: Factor Score and Descriptive Statistics for “Factors attributed to a lack of a project pipeline” variables.....	49
Table 16: Factor Score and Descriptive Statistics for “Effectiveness and Efficiency of Public Policies” Variable	49
Table 17: Factor Score and Descriptive Statistics for “financial Instrument alignment with Pension Fund or asset manager investment strategy (risk-return)” variable.....	51
Table 18: Factor Score and Descriptive Statistics for Investment Manager and Pension Fund Preferred financial instrument for infrastructure investment variables	53
Table 19: Factor Score and Descriptive Statistics for “Liquidity level of preferred instrument” variable	53
Table 20: Factor Score and Descriptive Statistics for “Scale of capital investment of preferred instrument” variable	55

Table 21: Factor Score and Descriptive Statistics for “Riskiness of Preferred instrument” variable	57
Table 22: Factor Score and Descriptive Statistics for “Risk Allocation between Private and Public Sector in PPP Projects” variable	58
Table 23: Factor Score and Descriptive Statistics for “Investment horizon of preferred instrument” variable	58
Table 24: Factor Score and Descriptive Statistics for “factors causing high risk in infrastructure investment/assets” variables	60
Table 25: Factor Score and Descriptive Statistics for “Internal resources and investment expertise to manage infrastructure investment” variable	61
Table 26: Factor Score and Descriptive Statistics for “Factor attributed to lack of internal resources” variables.....	62
Table 27: Factor Score and Descriptive Statistics for” Impact of Member choice on Pension Fund Investment Strategy” variables.....	62
Table 28: NAMFISA Registered Investment Companies.....	88
Table 29: NAMFISA REGISTERED Unlisted Investment Managers(UIM).....	89
Table 30: NAMFISA Registered pension funds and Friendly Societies	90
Table 31: Summary of survey responses from Investment Managers respondents	95
Table 32: Summary of survey response from Pension Funds respondents.....	100
Table 33: Investment Manager Response Coded Data	106
Table 34: Pension Fund survey response Likert Coded Data	109

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GLOSSARY OF TERMS

AfDB	African Development Bank
BIPA	Business and Intellectual Property Authority
CPB	Central Procurement Board
CMA	Common Monetary Area
DB	Defined Benefit
DC	Defined Contribution
DFI	Development Financial Institutions
EPC	Engineering, Procurement, and Construction
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GIPF	Government Institution Pension Fund
ICT	Information and Communication Technology
IPP	Independent Power Producers
JSE	Johannesburg Stock Exchange
KR20	Kuder and Richardson Formula 20
NAMFISA	Namibia Financial Institution Supervisory Authority
NamPower	Namibia Power Corporation
NamWater	Namibia Water Corporation
NBFI	Non-Banking Financial Institutions
NDP4	Fourth National Development Plan
NDP5	Fifth National Development Plan
NPC	National Planning Commission
NSX	Namibia Stock Exchange
OECD	Organisation for Economic Co-operation and Development
PPA	Power Purchase Agreement
PPP	Public Private Partnership
PRI	Private Risk Insurance
PV	Photovoltaic
REIPPPP	Renewable Energy Independent Power Producer Procurement Programme
RFA	Road Fund administrator
SOE	State-Owned Enterprises
SPV	Special Purpose Vehicle
UIM	Unlisted Investment Manager

UK	United Kingdom
ZAR	South Africa Rand

CHAPTER 1: Introduction

1.1 Background

Infrastructure plays a key role in driving a country's comparative advantage, economic growth and competitiveness, quality of life and the welfare of its citizens (Yeaple and Golub, 2002). Della Croce, Schieb, and Stevens (2011) argue in their survey on Pension Fund investments that economic infrastructure drives competitiveness and supports economic growth through increased private and public sector productivity, reduces the cost of doing business, diversifies the industrial base and creates jobs. The expansion and modernisation of physical infrastructure in sectors, such as energy, water, transport and logistics and information and communication technology, facilitates rapid industrialisation, economic progression and social transformation that form a vital part of Namibia's Vision 2030 goals to develop the country into an industrialised nation by 2030. Namibia aims to achieve Vision 2030 through policy tools, such as the National Development Plan (NDP), currently in its fifth iteration. Infrastructure development is essential to support developmental goals and to remedy the inherent infrastructure deficit that prevails as a developing country. Ageing colonial-era infrastructure and the need for additional infrastructure to facilitate economic and social development are the main drivers for the prevailing infrastructure deficit.

Arezki and Sy (2016) argue that Africa's developing countries need to reduce infrastructure deficits to achieve structural transformation and market integration across the African continent. Namibia's standard gauge system railway network is underutilised mainly due to inefficiencies and its current state of disrepair. The road network thus carries a disproportionately high percentage of freight which increases wear and tear. Road freight accounted for up to 80% of the total tonne-kilometres of goods transported in Namibia including transit cargo in 2018 (Namibia-German Centre for Logistics, 2018). In the Namibian context, infrastructure development is essential in improving prevailing social and economic conditions. Access to affordable electricity for urban and rural households currently stands at 66% and 18.7% respectively (Namibia Statistics Agency, 2016). Access to clean and affordable energy is as an enabler to economic development, especially amongst rural communities.

The fact that Namibia imports approximately 60-70% (Namibia Power Corporation, 2018) of electricity from neighbouring countries, due to the lack of locally installed generating power

stations, validates the need for the development of energy infrastructure. Namibia is a net importer of electricity which is a significant drain on the economy due to the sustained capital outflow to facilitate electricity imports. Similarly, a lack of access to water and sanitation amongst urban and rural households hampers efforts to eliminate water-borne diseases and improve health. The above highlight the need for infrastructure development. The NDP5 estimated a funding requirement for the infrastructure of roughly N\$ 73 billion (National Planning Commission, 2017c) with most funding earmarked for energy, road and railway infrastructure. Namakalu et al., (2014), as part of the Bank of Namibia infrastructure symposium held in 2014, projected a significantly higher funding requirement at N\$ 223 billion for transport, water, energy, ICT and housing infrastructure, with rail, housing and port infrastructure requiring the highest funding. Namakalu et al. (2014) base the funding estimates on NDP4 which is the predecessor to the NDP5.

The main source of finance for infrastructure development under the NDP4 and, by extension NDP5, comes from fiscal budgets, corporate borrowings and government subsidies as outlined in Table 1 (Namakalu et al.,2014). The funding gap is projected at N\$ 150 billion based on the requirement of N\$ 223 billion and available funding of N\$ 73.5 billion, as stated in Table 1. Based on the terminal review of the NDP4 (National Planning Commission, 2017b), the progress with implementation of infrastructure initiatives have not all been satisfactory which resulted in initiatives rolling over into NDP5. It can, therefore, be concluded that there is slow progress with the implementation of NDP infrastructure initiatives. The lack of progress of the implementation of NDP5 plans can be attributed to a shortage of funding from the traditional sources of funding, such as budgetary allocations, user fees and borrowings. A classic example of the slow implementation of infrastructure initiatives in the energy sector is the target for NDP4 to achieve a locally installed capacity of 750 MW by 2018. This objective now forms part of NDP5, and the target has been increased marginally to 755 MW which must be achieved by 2023.

Table 1: NDP4 Funding Plan

N\$ millions	2014/15	2015/16	2016/17	2017/18 - 2019/20	Total
User Fees	3 446,30	5 964,60	6 279,70	10 426,60	26 117,20
Government Subsidy	1 999,00	4 523,40	3 598,90	4 787,80	14 909,10
Borrowing	2 176,60	6 723,80	8 639,40	14 965,20	32 505,00
Total	7 622,00	17 211,80	18 518,10	30 179,60	73 531,40

1.2 Problem Statement

The infrastructure funding deficit can be eliminated or reduced by crowding in institutional investors, such as Pension Funds, insurance companies and other multinational financial institutions, such as development financial institutions (DFI), in the infrastructure investment landscape. Implementation of NDP5's infrastructure master plan will improve Namibia's goals of becoming a logistics hub and ensure the security of electricity supply to support economic growth. The electricity supply industry and logistics sector (port, railways and road infrastructure) make up about two-thirds of NDP5's infrastructure budget plan (National Planning Commission, 2017c). Investment in the electricity sector will be used to increase power generation capacity, especially renewable energy technology, expansion of the transmission network and access to affordable electricity. The logistics sector will require investment in expanding the road infrastructure, especially the networks that link Namibia to neighbouring countries. Similarly, the railway network will need refurbishments and upgrades to a modern standard and extensions to northern neighbours, namely, Zambia, Zimbabwe and beyond. Transit to/from Zambia accounted for about 92% and 60% respectively of all container transit through Namibia, most of which is transported via road freight due to the absence of railways lines between Namibia and Zambia (Namibia-German Centre for Logistics, 2018) as illustrated in Figure 1. As shown in Figure 1, significant investment is required to link the Namibian railway network with the Angolan railway network and the Zambian railway networks.



Figure 1: Current Railways Network in Southern Africa

Source: (RMB Global Markets, 2019)

Funding for local infrastructure projects from internal resources will be beneficial for all stakeholders that include project developers, institutional investors, lenders, government and consumers of goods or services provided by these assets. Public sector investment in OECD (developed) countries, which normally sets the trend in terms of development, has been on a decline while the share of private sector investment has increased. Namibia is still a developing country and has so far been reliant on government budgetary allocations or borrowing to fund infrastructure projects. Therefore, in the context of limited fiscal space, the private sector investment will continue to grow and eventually overshadow the government's investment in infrastructure development. Namibia's development is expected to follow the same trend as industrialised OECD countries when it comes to private sector investment in infrastructure, and institutional investors, such as Pension Funds, have a major role to play in this sector.

Given the vast funding requirements and ample financing capacity, institutional investors, such as Pension Funds, are a viable source of finance to bridge the prevailing infrastructure funding gap. A study by Bitsch, Buchner, & Kaserer (2010) on the characteristics of infrastructure investments found that infrastructure funds are a perfect match for Pension Funds because infrastructure's return and cash flow profiles match Pension Funds' long term liabilities. The Pension Fund industry accounts for about 55% of all the assets held by all Non-Banking Financial Institutions (NBFI). Pension Funds are fully cognisant of the risks of mismatch between their assets and liabilities hence the demand for stable income-oriented and inflation-linked investments that result in a better asset/liabilities match.

This research builds on preceding studies by Della Croce, (2012); Della Croce et al., (2011); Ehlers, (2014); Inderst, (2010); Inderst and Della Croce, (2013) who examined the challenges in infrastructure investment and experiences of Pension Funds in Australia and Canada.

1.3 Research Questions

Given the size of the Pension Funds industry, Namibia should not depend disproportionately on Foreign Direct Investment (FDI) for infrastructure development or government budgetary allocation. The country ought to repatriate a portion of investments in foreign-held assets to invest in local assets to foster local development and stimulate economic growth. Local sources

of financing will benefit the entire economy through the multiplier effect because money circulates in the local financial market/systems as opposed to being withdrawn as in the case of external funding. External funding will lead to net capital outflow because of interest and repayment of principal. The research question was broken down into the following sets of detailed questions:

- a) What factors deter increased investment by Pension Funds in local infrastructure?
- b) What significance do Pension Funds place on local infrastructure investments?
- c) What is the effect of Pension Fund regulation on infrastructure investment?

1.4 Research Objectives

The objectives of this research were as follows:

- a) To explore the challenges associated with infrastructure investments by Pension Funds in Namibia;
- b) To understand the priority and attitudes Pension Funds have towards infrastructure assets in Namibia; and
- c) To understand the impact of regulation on infrastructure investing.

1.5 Justification of the study

The fact that most of the Pension Fund assets are invested in various financial instruments outside of Namibia (as shown in Table 3), despite the high funding requirements shown in Table 1, proves that there is a need for a better understanding of the forces driving the lack of investment by the Pension Funds in infrastructure. Pension Fund investment in local assets has the potential to stimulate economic growth and development. The finding of this research will empower Pension Fund administrators (trustees, principal offices and fund managers), government agencies tasked with infrastructure development, the financial sector and the regulator about remedies that can be employed to address the challenges faced by the Pension Funds in infrastructure investing. Given the above context, the study is justified based on the potential impact of the research findings.

1.6 Limitation of the Study

The body of knowledge on the research subject is very wide due to the extensive research that has been conducted from various perspectives. The aim of this research was not to delve into issues that are specific to the Pension Fund industry, the infrastructure industry or the financing aspects. The research focus was limited to investigating convergent issues which contribute to underinvestment in infrastructure assets/projects by Pension Funds as shown in Figure 2. Additionally, the study tested theoretical frameworks developed in previous research in a Namibian context to reveal whether the challenges faced by Namibian Pension Funds have comparable underlying causes. The study acknowledges that the factor analysis was based on data that was not purely Likert scale as per standard practise and this may have a limitation on the findings especially on the relevance of the variable tested and impact on conclusions.

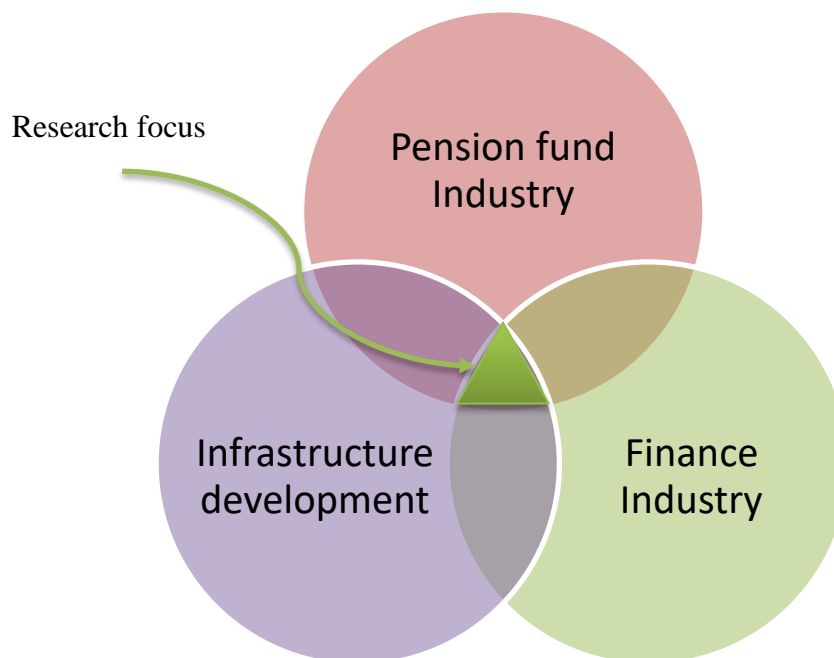


Figure 2: Research focus and Limitations

1.7 Structure of the Study

This section provides a brief overview of the content of each chapter in this dissertation report. Chapter 1 discusses the background and the problem statement, which further builds up to the research questions and objectives. This chapter also covers the justification for the study, study limitation and the organisation of the study. Chapter 2 reviews the Pension Fund industry and infrastructure development and finance in Namibia, followed by a critical review of literature

on infrastructure as an asset class, the Pension Fund investment models in infrastructure and challenges encountered by the Pension Funds in financing infrastructure.

Chapter 3 provides an overview of the research design and methodology followed in addressing the research questions and objectives. Furthermore, this chapter discusses the methodology employed during data collection and analysis and the research design that will ensure the credibility of research findings. Chapter 4 presents a summary of research findings based on the data collection and analytical framework discussed in the previous chapter, and finally, Chapter 5 discusses the conclusion and recommendations flowing from the research findings discussed in the previous chapter. This chapter also relates the research findings and conclusion to the theoretical frameworks discussed in the literature review and reviews the shortcomings and opportunities for future research.

CHAPTER 2: A literature review

2.1 Introduction

This chapter consists of five sections covering the following topics: (i) an overview of the Pension Fund industry in Namibia; (ii) a review of how infrastructure is developed and financed within the Namibian context; (iii) critical reviews of the empirical literature on infrastructure as an asset class, the characteristics of infrastructure as an asset class, the financial instruments that can be employed by institutional investors to gain access to infrastructure and associated risk-return profiles; (iv) a review of Pension Fund investment models in infrastructure and associated challenges; and (v) a summary of the chapter.

2.2 Overview of the Pension Fund Industry in Namibia

Pension Funds serve the purpose of providing income during retirement. Retirement age may vary from country to country but typically starts from the age of 60-65 years with an optional early retirement from the age of 55 years. Depending on country-specific legislation, employee and employer contribute a defined percentage of the employee's salary monthly to the fund for investment and savings purposes. Pension Funds traditionally invest savings in liquid assets, such as listed equities, bonds or fixed-income instruments with a long investment horizon. Other illiquid investments, such as funds, private equity (unlisted and property), have increasingly become prominent in Pension Fund portfolios. Retirement income can either be in the form of a lump sum pay-out at retirement or an annuity paid out at regular intervals until a beneficiary's death. Pension Fund annuity payments are sometimes referred to as "superannuation funds". In the Namibian context, a Pension Fund typically pays out a third of the savings as a lump-sum and the rest as a monthly annuity. A provident fund, however, pays out the entire savings in a lump sum. Sixteen of the 135 registered Pension Funds are provident funds while the rest are pension (retirement) funds.

Pension Funds are classified either as Defined Benefit (DB) or Defined Contribution (DC). Modern funds are mostly DC funds, while most of the older funds are DB funds. Under DB funds, employers guarantee the benefit that the employee will get upon retirement based on the employee's salary before retirement. However, DB funds are being transformed into Defined

Contribution (DC) funds whereby an employee's retirement benefit is determined based on their contributions and any returns earned during the contribution period. The risk for any shortfall in DC funds rests on the employee rather than on the employer. The liabilities of the DB funds are long term in nature as they must provide for retirement benefits until a member's death. DC funds also have a long term investment horizon; however, they require more liquidity as they pay out a lump sum to members at retirement or when the employee exits the fund. Greater choice allows fund members to choose the risk level of their retirement savings and investments. Most funds do not, however, offer members' greater choice as this increases the cost of administering the fund. A few funds offer older members an option of investing in a portfolio consisting of low-risk assets, such as bonds, fixed interest and money markets. DB funds tend to invest in liquid assets/instruments, such as bonds, while DC funds, which cater mainly for younger workers, are increasingly likely to have a greater allocation of shares. The inherent risk transfer from employer to the employee, due to conversion of Pension Funds from DB to DC, may lead to higher risk aversion and hence lower allocations to shares and illiquid assets.

Figure 3 below shows the Pension Fund investment landscape. Trustees are elected by employees to administer the operations of the Pension Fund on behalf of the members and final beneficiaries. The trustees, in turn, appoint administrators, such as principal offices, internal or external administrators, advisors/consultants and auditors, who are responsible for the daily operations of the Pension Funds. The trustees, on recommendations from consultants and advisors, appoint fund/asset managers to manage all or a portion of the assets. Depending on the size of the Pension Fund, the administrative activities are either carried out internally or outsourced to an external Pension Fund administrator. Administrative activities include the collection of savings from employers, investing with approved fund managers as per investment policies and disinvesting and paying out Pension Fund benefits to beneficiaries. Asset managers construct asset portfolios based on a combination of asset manager investment plans or Pension Fund investment policies. The activities of all stakeholders (trustees, principal offices, Pension Funds, administrators and assets managers) are regulated by the Namibia Financial Institutions Supervisory Authority (NAMFISA) as provided for in the NAMFISA Act 3 of 2001. Due to the nature of their fiduciary duties, Pension Funds are heavily regulated, especially concerning their risk profiles and the treatment of assets on their books. Pension Fund regulation limits investment for each asset class as shown in Table 2.

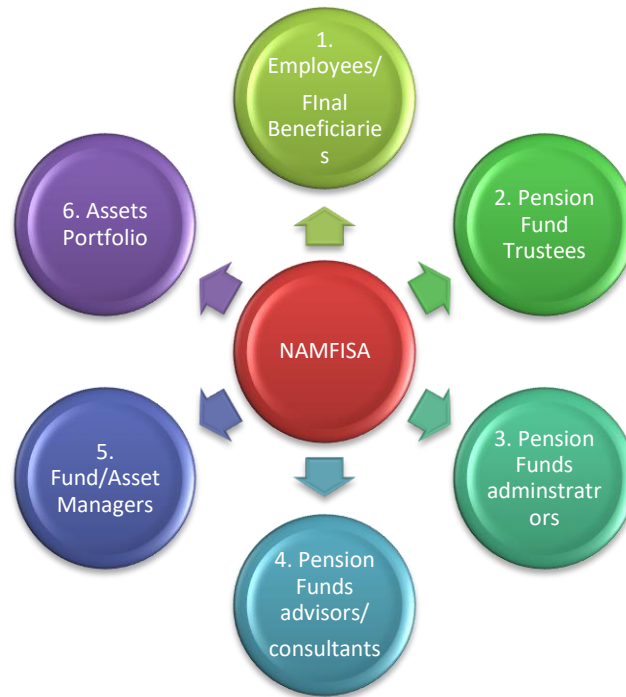


Figure 3: Pension Fund Investment Landscape

According to NAMFISA (2018), there are 135 active and seven (7) inactive funds registered with the supervisory authority. The Pension Fund industry is highly fragmented with one (1) fund, namely, the Government Institution Pension Fund (GIPF), which accounts for more than two-thirds of the assets under management by the Pension Fund industry. The top five Pension Funds in the industry hold 75.2% of the industries' total investment holdings (NAMFISA, 2019c). The Pension Funds vary in terms of membership, classification of a defined benefit or defined contribution, asset under management, the number of members and the average age of members. The biggest Pension Fund is the Government Institutions Pension Fund, which is a defined benefit fund with 102 254 active members as of 2018 and N\$ 110 billion in assets under management. As a defined benefit fund, the government is ultimately the guarantor for the benefit pay-out. GIPF pays out a lump sum to members at retirement and, after that, a monthly pension for life (Government Institution Pension Fund, 2019). GIPF considers the inability to meet future claim obligations as its biggest risk and thus keeps sufficient employer (government) reserves and continually engages with a participating employer, as a defined benefit fund, to ensure adequate contribution rates amongst other mitigating controls. As the biggest fund in term of member and asset under management, GIPF sets the trend in terms of best practice standards for investments and Pension Fund management.

African Pension Funds are regarded as being in the “*demographic sweet spot*” (Sy, 2017) due to lower dependency ratios, increasing labour forces due to a mainly young population and the lower impact of the ageing population. Pension Fund assets have been on the increase while the liabilities are low and mainly long term (Bank of Namibia & Namfisa, 2018; Bank Of Namibia & NAMFISA, 2019; NAMFISA, 2019c). Pension Funds are a natural investor in infrastructure, given their match between the infrastructure’s long term, higher returns, stable and inflation hedged cash flows and the long term nature of Pension Fund liabilities.

As of April 2019, the Namibian Pension Fund industry cumulatively held N\$ 158.5 billion (Bank of Namibia & Namfisa, 2018; Bank Of Namibia & NAMFISA, 2019; NAMFISA, 2019c) in assets under management with the majority held in overseas and local listed equity/shares. Pension Fund regulation currently requires that Pension Funds hold a minimum of 1.75% and a maximum of 3.5% of their assets in unlisted investments, most of which are in private equity/unlisted equities (Ministry of Finance, 2013). Pension Funds are largely compliant with Regulation 28 on assets held with Unlisted Investment Managers (UIMs) because compliance is measured against asset committed to UIMs and not actual drawdown. The actual drawdown/investment is significantly lower than the compliance limits, as shown in Table 2.

Table 2: Allocation per asset class Q2 and Regulation 28 Limits

Source (NAMFISA, 2019c)

Asset class	Q3 2018	Q4 2018	Regulation 28 limits
Credit Balances	10.6%	11.1%	95%
Government Bonds	12.0%	11.0%	95%
SOE Bonds	0.8%	4.6%	30%
Corporate Bonds	6.4%	1.7%	50%
Foreign Bonds	8.6%	6.9%	50%
Property	3.7%	3.9%	25%
Shares	55.7%	56.6%	75%
Other Claims	1.1%	0.9%	25%
Other Assets	0.3%	2.5%	2.5%
Unlisted Investment	0.7%	0.7%	Min 1,75% Max 3,5%

A few UIMs invest in property and infrastructure, as shown in Table 5. The Namibia Stock Exchange (2019) reported that outstanding bonds due from state-owned enterprises (SOEs), as of 5 July 2019, stood at N\$ 1,741 billion of which only N\$ 950 million is to SOEs with infrastructure exposure, namely, NamWater and NamPower. The approved bonds programme is N\$ 6.5 billion, of which N\$ 4 billion is for infrastructure SOEs (NamWater and NamPower). The drawdown on the approved bond program stood at slightly

over 25% of the approved bond program which hints at issues with affordability and competitiveness of interest rates/bond yields.

Namibia has recently increased the local asset requirement from 35% to 42.5% of total Pension Fund assets by September 2018. Table 2 shows that compliance with this requirement has varied since the increase in local asset requirement and the industry has not been compliant mainly due to the fluctuation in exchange rates between the South African Rand and major reserve currencies, such as the US dollar. Assets that are repatriated from foreign investments are invested in traditional asset classes, such as fixed-interest (bonds) and the money market. Thus, the regulatory requirement did not drive investments into alternative assets and instruments, such as infrastructure and unlisted investments. Based on the statistics in Table 2 and

Table 5 and the limited pool of shares/equities with infrastructure exposure on the Namibia Stock Exchange, it can be inferred that Pension Fund investment into infrastructure assets, especially local assets, is limited and below the international benchmark of 10-15% of assets.

Table 3: Pension Fund Asset held in each region

	Q4 2017	Q1 2018	Q2 2018	Q3 2018	Q4 2018
Namibia	42%	45%	40%	40%	42%
Common Monetary Area (CMA)	27%	25%	27%	26%	27%
Africa (excl CMA)	4%	5%	5%	5%	3%
International	26%	25%	28%	29%	28%

Similarly, NAMFISA regulates the Non-Bank Financial Institution (NBFI) which acts as an asset manager for most, if not all, Pension Funds in Namibia. There are 25 Investment Managers and 23 Unlisted Investment Managers (UIMS) registered with NAMFISA as shown in Table 28 and Table 29 in Appendix B. The industry is dominated by a handful of Investment Managers who manage about 67% of all investments. Foreign-based Investment Managers manage a significant portion of Pension Fund assets. Given the high likelihood that a Pension Fund does not have expertise nor experience in infrastructure investment, the Investment Manager plays a significant role in exposing a Pension Fund to infrastructure assets and structuring its asset allocation to achieve the desired risk-return profiles.

2.3 Infrastructure Development and Financing in Namibia

As outlined in Table 4, infrastructure development in Namibia is the primary responsibility of various levels of government (central, regional and local) and State-Owned Enterprises (SOEs) that are responsible for the provision of public (merit) goods and services (National Planning Commission, 2017c). Table 4 shows the list of entities tasked with the provision of public goods and services in Namibia. The private sector is increasingly being crowded-in to the infrastructure landscape by the public sector and government, especially in the power sector where the Independent Power Producers (IPPs) are becoming prominent. The increase in private sector participation in power generation is partly due to the lack of government funding and guarantees for strategic projects, such as the Kudu Gas-to-Power Project and Baynes Hydroelectric Power Project. The government needs to prioritise its limited resources for needs, such as healthcare and education, where alternative financing may not be feasible or affordable.

Table 4: Public Entities Responsible For Infrastructure Development

Public Goods and Services	Institutions
Public roads and bridges	Road authority
Electrical infrastructure (generation, transmission, distribution and supply)	NamPower/Municipalities/Regional Electricity Distributors
Port facility	Namibia Ports
Telecommunication	Namibia Postal and Telecommunication Holdings (Telecom)
Water and Sanitation	NamWater/Municipalities
Housing	Namibia Housing Enterprises
Railways	TransNamib
Airports/Aviation	Namibia Airports Company
Fuels	NamCor
Public health	Government and private sector
Education	Government and private sector

Table 1 shows the funding plan for the NDP4, with a forecasted funding shortfall of N\$ 150 billion based on the funding requirement of N\$ 223 billion (Namakalu et al., 2014). The funding shortfall demonstrates the need for alternative models of infrastructure development and financing. An alternative source of finance may include a listing of equities and bonds on the stock exchanges, such as the Namibia Stock Exchange (NSX), or the much larger Johannesburg Stock Exchange (JSE). SOEs, such as NamPower, NamWater Telecom and the Road Fund Administration, have previously listed bonds on the NSX and JSE. The instruments detailed in Figure 7 are viable vehicles for institutional investors, such as Pension Funds, insurance

companies and fund managers, to channel their investments to infrastructure projects and companies to alleviate the funding shortfalls.

Regulation 28 on unlisted investments encourages Pension Funds to invest in the domestic market to ensure that Namibian savings are utilised to stimulate local development. As shown in

in Table 5, the number of unlisted fund managers and available funding capacity for infrastructure (non-property) is limited, furthermore, the maximum investment by Pension Funds is limited to 3.5% of funds under management which represents a ceiling of N\$ 5.5 billion for the entire industry based on the total Pension Fund assets of N\$ 158.5 billion (Bank Of Namibia & NAMFISA, 2019). In line with Regulation 28 of the Pension Fund Act, Pension Funds, such as GIPF, have invested in unlisted investment vehicles, as shown in

Table 5 and Table 29, for various mandates inclusive of infrastructure. The Unlisted Investment Managers, via their Special Purpose Vehicles, manage about N\$ 1.2 billion of GIPF's assets in Unlisted Investments. According to the Government Institution Pension Fund (2019)'s 2018 Annual report, none of the three (3) UIMs with mandates for infrastructure investment had utilised the assets allocated to them which points to the lack of a pipeline of bankable projects.

As studied in section 2.5, international benchmarks set the percentage of Pension Fund assets in infrastructure at a 10% to 15% range. Alternative investment vehicles, such as listed funds, need to be investigated to allow Pension Funds more flexibility in investing in infrastructure projects for the development of Namibia.

Table 5: Unlisted Investment Managers with GIPF Mandates

Source: (Government Institutions Pension Funds, 2019)

Number	Unlisted Investment Manager	Special Purpose Vehicle	Mandates
1	IJG Capital (Pty) Ltd	IJG Frontier Investment Fund Ltd	Private Equity and Venture Capital
2	BFS NamPro Fund Manager (Pty) Ltd	The Namibia Procurement Fund I and II	Procurement Debt Fund
3	EOS Capital (Pty) Ltd	Allegrow Fund (Pty) Ltd	Private Equity
4	Mergence Investment Managers (Namibia) (Pty) Ltd	Mergence Namibia Infrastructure Fund	Infrastructure and Private Equity
5	Koningstein Capital (Pty) Ltd	Koningstein Capital Property Investment Fund	Property Development and Private Equity
6	Musa Capital Namibia (Pty) Ltd	The Namibia Mid-Cap Fund	Private Equity
7	Ino Harrith Capital (Pty) Ltd	Namibia Infrastructure Fund	Infrastructure and Private Equity
8	Old Mutual Alternative Investments (Namibia) (Pty) Ltd	Tunga Real Estate Fund and Expanded Infrastructure Fund	Property (Retail, Residential and affordable Housing) and Infrastructure services
9	Baobab Capital (Pty) Ltd	Baobab Growth Fund (Pty) Ltd	Venture Capital
10	Ariya Bridge Capital (Pty) Ltd	Ariya Bridge Trust Fund	Infrastructure and Private Equity
11	Preferred Management Services	Preferred Investment Property Fund	Property development
12	VPB Namibia	VPB Growth Fund	Private Equity and Venture Capital
13	Safland Property Group Namibia	Frontier Property Trust	Property, Focus on retail property, Offices and Industrial
14	Kongalend Capital (Pty) Ltd	Kongalend Renewable Energy Trust	SME Group Lending and Solar Energy Loans

Public-Private Partnerships (PPPs) are also an alternative approach to infrastructure development whereby the government or government-owned entities partner with the private sector to develop the infrastructure required for the provision of public goods and services. The Namibia PPP legislation advocates that PPPs must represent value for money by involving the provision of services to government and a substantial transfer of risk from the public to the private sector. The PPP Act No. 4 of 2017 was enacted but only came into effect in December 2018, so the track record is rather limited. In a demonstration of the success of PPPs, the private sector is projected to have an installed capacity of approximately 245 MW of renewable (wind and solar PV) energy generation by the end of 2022. Namibia Power Corporation (NamPower) has been able to secure private sector investment by entering into Power Purchase Agreements (PPA) with private developers. Private-sector investments, facilitated through PPP projects, has freed up significant capital that NamPower can use for technology/infrastructure projects which may not be viable or affordable in the private sector's purview.

The above characterisation of the infrastructure development industry shows the need for changes in infrastructure development and the use of alternative financial assets and instruments as discussed in section 2.4.3.

2.4 The literature on Infrastructure as an asset class

2.4.1 Definition of Infrastructure

According to OECD glossary, infrastructure is generally defined as a system of public works which can include roads, utility lines and public buildings. Inderst (2010) defines infrastructure within an investment environment as covering the following:

- a) Transportation (airports, bridges, roads and ports etc.);
- b) Utilities (power generation and distribution networks, water and sewerage services);
- c) Communication networks; and
- d) Renewable energy such as solar, wind, geothermal and biomass etc.

And social infrastructure, including:

- i.) Educational facilities;
- ii.) Healthcare facilities such as hospital and clinics; and
- iii.) Sports facilities.

The above categorisation might seem clear cut, however, there are some overlaps due to the classification of companies that own or operate the infrastructure assets/projects, such as utility companies which have generation, transmission and distribution assets. Beeferman (2008) further splits the economic infrastructure into the transportation and utility sectors. Overlaps in definitions can arise in terms of categorising infrastructure as either public or private. In the utility industry, power generation assets can be privately owned; however, the services are provided for the public good or on behalf of the public sector. Is the definition of the “public” dependent on the ownership structure or the services that are being provided and to whom?

2.4.2 Characteristics of infrastructure as an Asset Class

Institutional investors have typically invested in infrastructure via listed companies or fixed income instruments (Della Croce, 2012). Investors have begun to recognise that infrastructure is a unique asset class despite its inherent heterogeneity. Infrastructure is distinct from property

or real estate assets. The investment industry prefers to categorise infrastructure in terms of the economic and financial characteristics as opposed to physical features (Inderst, 2010). An infrastructure asset should typically operate in the environment characterised by little competition, due to natural monopolies, government regulations or concessions. The degree of competition, however, might also be influenced by the maturity of markets/regulations in the country. For example, in the United Kingdom (UK), power market developers bid to construct and operate a merchant power plant that will sell power to any buyer on open market principles. The nature of the UK market means that there are no guarantees in terms of the offtake of the power from the power plant.

The following may form part of the infrastructure's economic characteristics:

- a) High barriers to entry which can arise as a result of factors such as high capital investments and regulations;
- b) Economies of scale arising due to high fixed costs and low variable costs;
- c) Inelastic demand for goods and services which gives pricing power to infrastructure assets;
- d) Long durations associated with concessions which range from 25 to 99-year leases.

The value proposition of infrastructure is to capture the financial characteristics discussed in the following sections:

2.4.2.1 Attractive Returns

Infrastructure asset return is only second to private equity returns (Morgan, 2007) but above stocks, bonds and cash. Furthermore, research by Deutsche Bank (2013) revealed that listed infrastructure returns outperform global equities.

2.4.2.2 Low Sensitivity to Swings in Economy Growth and Financial Markets

Newell, Peng, & de Francesco (2011); Oyedele, (2014); Russ, D., Thambiah, Y., Foscari, (2010) as cited by Thierie & Moor (2016) confirm the finding that infrastructure returns are insensitive to economic cycles. This finding was further reaffirmed by Bitsch, Buchner, & Kaserer (2010) in empirical studies on private equity-type investments in unlisted infrastructure deals. Oyedele (2014) further claims that, despite the enhanced investment performance as a

result of including infrastructure in a mixed-asset portfolio, the main benefits are more in terms of risk reduction, diversification and return enhancements.

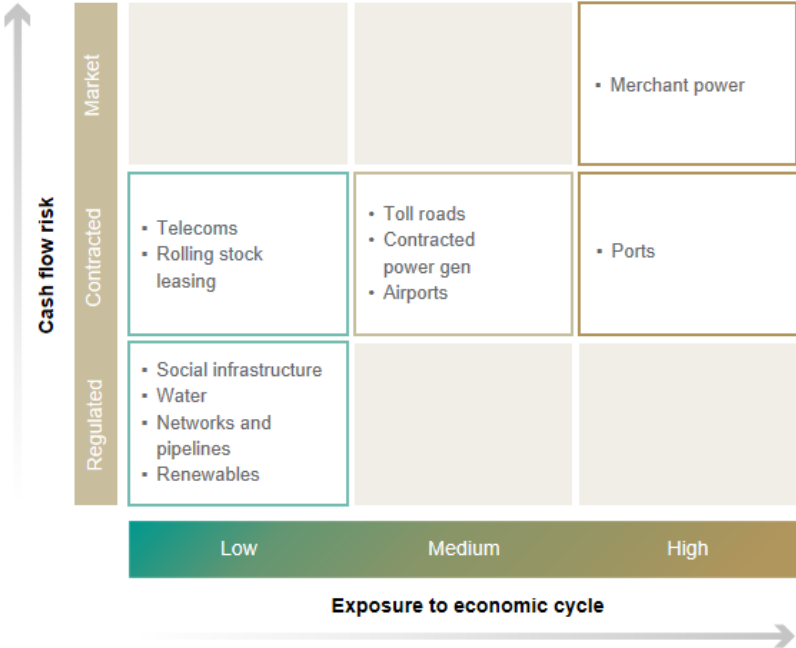


Figure 4: Infrastructure Exposure to cash flow risk and economic cycle

Source (Mark Roberts, Patel, & Minella, 2015)

2.4.2.3 Low Correlation with Other Asset Classes

Infrastructure returns have a low correlation with other asset classes which offers diversification potential to investors. Peng & Newell (2007) in the study to ascertain “*the significance of infrastructure in an investment portfolio*” found low correlation coefficients between infrastructure and equities and bonds. This is confirmed by Inderst and Della Croce (2013) and (Russ, D., Thambiah, Y., Foscari, 2010) as shown in Figure 5. Infrastructure assets are expected to have similar characteristics irrespective of whether they are in developed or developing countries; hence, infrastructure in developing countries is also expected to have a low correlation with other asset classes.

	US Equities	Non-US Equities	Global Bonds	REITs	Commodities	Hedge Funds	Inflation-Linked Bonds	Private Equity	Global Infrastructure	Customized Infrastructure
US Equities	1.00									
Non-US Equities	0.63	1.00								
Global Bonds	0.23	0.17	1.00							
REITs	0.56	0.45	0.22	1.00						
Commodities	0.15	0.45	0.14	0.18	1.00					
Hedge Funds	0.46	0.61	0.23	0.30	0.43	1.00				
Inflation-Linked Bonds	0.19	0.21	0.86	0.24	0.32	0.25	1.00			
Private Equity	0.84	0.63	0.01	0.61	0.11	0.52	0.01	1.00		
Global Infrastructure	0.44	0.83	0.32	0.44	0.40	0.71	0.42	0.56	1.00	
Customized Infrastructure	0.44	0.76	0.18	0.35	0.69	0.50	0.31	0.39	0.68	1.00

Figure 5: Infrastructure correlation with other asset classes

Source: (Russ, D., Thambiah, Y., Foscari, 2010)

2.4.2.4 Long Term, Stable and Predictable Cash Flows

Bitsch, Buchner, & Kaserer(2010) evaluated risk, return and cash flow characteristics of infrastructure and non-infrastructure investments done by unlisted funds. The study covered about 363 infrastructure and 11,223 non-infrastructure deals. In this empirical study, Bitsch et al. (2010) found that infrastructure assets typically have a long term investment horizon; however, the study did not find strong evidence of stable cash flows relative to non-infrastructure assets. Researchers argue that higher market risks cause higher infrastructure returns. In contrast, studies by Roberts & Durkin (2014) on behalf of Deutsche Bank, revealed that stable cash flows associated with unlisted infrastructure assets in European countries are partly attributed to regulations and inelasticity of demand.

Furthermore, subsequent studies by Bitsch (2012), on cash flows of listed infrastructure companies and funds, found that they have more stable and predictable cash flows. The finding by Bitsch et al. (2010) seems to have been superseded by most recent research and is thus not homogenous across the asset class. The difference in findings can partly be attributed to the heterogeneity of the infrastructure asset class; different infrastructure assets exhibit widely varying cash flow characteristics depending on the nature of the infrastructure involved.

2.4.2.5 Good Inflation Hedge

Infrastructure does not have any significant inflation linkage and thus offers no natural inflation hedge for investors. Empirical evidence on inflation linkage seems to contradict findings by Roedel and Rothballer (2011) which suggest that inflation can be passed on to the customers due to infrastructure assets' quasi-monopolistic nature and the inelasticity of demands

associated with them. This apparent contradiction could be explained by the fact that infrastructure funds forming part of the study were structured as funds in the private equity industry. The cash flows between the portfolio company and the fund may, as a result, differ from those between funds and investors due to the fund's fees and the number of projects included in the funds. Numerous academic reports note that cash flows are frequently linked to inflation through the regulatory framework and contractual arrangements (Thierie & Moor, 2016). Renewable energy projects, developed under South Africa's Renewable Energy Independent Power Producer Procurement Programme (REIPPPP), are typical examples of inflation hedge through the tariff indexation against inflation as part of the Power Purchase Agreement (PPA) (Eberhard, Kolker, & Leigland, 2014). Several authors (Croce, 2011; Mart Roberts & Durkin, 2014; Russ, D., Thambiah, Y., Foscari, 2010) argue that, because of the monopolistic nature of the asset and inelasticity of demand, inflation can be easily passed on to consumers. Although most papers seem to back the inflation hedging capability on infrastructure assets, the associated coefficients are often statistically insignificant. It can thus be concluded that, even though the investment community is convinced of the inflation-hedging aspects of infrastructure assets, empirical evidence proving such a theoretical framework is limited.

2.4.2.6 Low Default Rate

Studies by Bitsch et al. (2010) discovered that infrastructure assets have low default rates despite offering significantly higher returns. This can be attributed to the monopolistic nature of the assets.

Studies by various authors found that infrastructure is a diverse asset which may range from the purely economic to social infrastructure with similarly high heterogeneous financial characteristics. The heterogeneity of infrastructure's financial characteristics may present challenges to the Pension Fund in so far as possessing the requisite expertise to make appropriate investment decisions.

2.4.3 Financial instruments

Institutional investors, such as Pension Funds, can participate in infrastructure finance in the form of either debt or equity finance as illustrated in Figure 6. The debt and equity finance can

be done either directly into the infrastructure project or indirectly via listed funds/bonds or listed shares of companies that operate infrastructure assets. Below is a detailed overview of each form of investment. The direct investment mechanism highlighted in Figure 6 offers many different financial characteristics compared to indirect methods, in most instances, to the benefit of the investors. Investment in listed equities and bonds in the Namibian market is limited, given the number of companies listed on the Namibian stock exchange (NSX). As of March 2019, only one infrastructure company, Nimbus Infrastructure Limited (Namibia Stock Exchange, 2019) was listed. A few bonds from infrastructure operators and developers, such as NamPower, NamWater and Road Authority, have been previously listed on NSX. NamPower currently has a ZAR 5 billion bond listed on the JSE of which ZAR 750 million has been drawn down. Most, if not all, financing vehicles are available in Namibia, albeit on a limited scale relative to South Africa where the financial markets are highly developed.

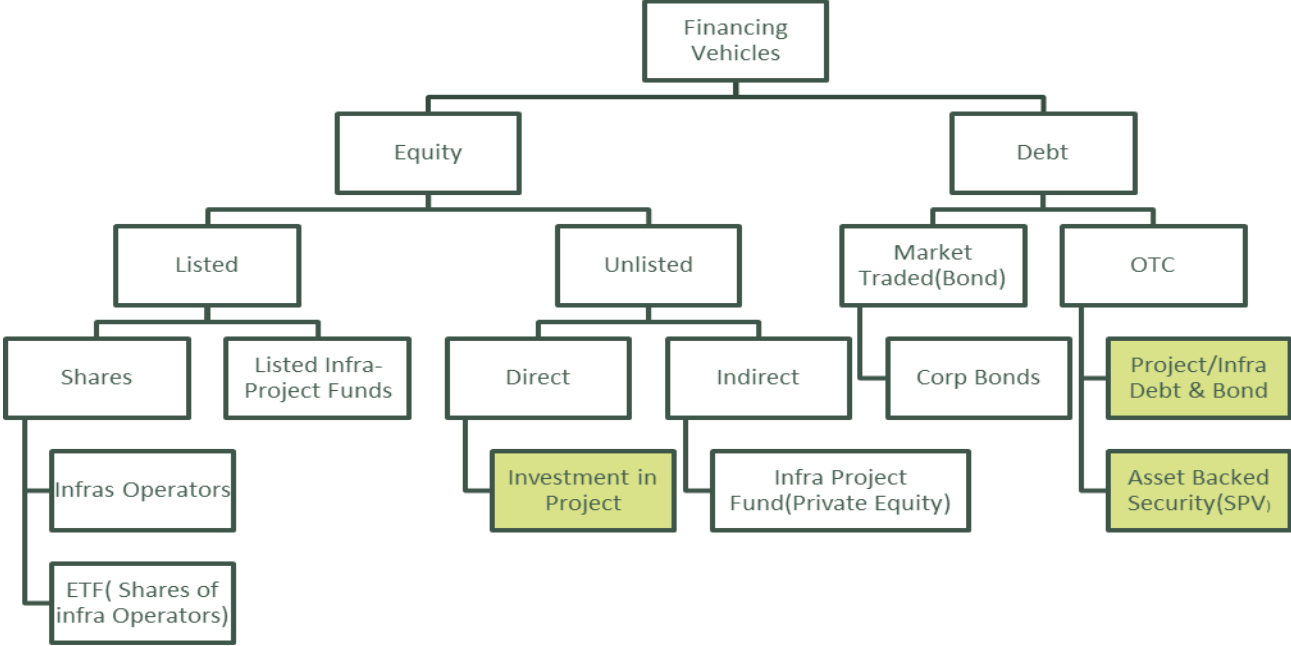


Figure 6: Infrastructure Financing Vehicles
 Source: (Della Croce, 2012)

2.4.3.1 Listed Equities

Listed equities offer indirect exposure to infrastructure assets; however, the returns are not the same as in the case of direct investment. Listed equities of infrastructure operators and infrastructure funds are less risky than direct investments and enable smaller Pension Fund investors to partake in infrastructure finance (Bitsch et al., 2010). Listed infrastructure assets forming part of a portfolio investment are attractive for their risk reduction role rather than return enhancements (J. B. Oyedele, Adair, & McGreal, 2014). A feature of listed infrastructure

assets makes it easier to diversify a portfolio and reduce exposure to country-specific risks such as political and regulatory risks.

- a) Listed Shares
 - i) Infrastructure operators: Shares of utility companies that develop and operate infrastructure assets, such as power generation, transmission and distribution assets. They afford investors exposure to the underlying asset, albeit not to the fullest extent. An investor looking at inflation hedged return can get exposure through infrastructure operators.
 - ii) Exchange-traded funds of infrastructure operators: These are a diversified portfolio of infrastructure operators that offer the same advantage as shares in infrastructure operators
- b) Listed Infrastructure funds: Listed shares of funds that invest in infrastructure. The fund can either be homogenous or heterogeneous in terms of the sector in which it specialises. Listed or unlisted funds invest in more than one project.

2.4.3.2 Unlisted Equities

Unlisted equity is shares of companies that are not listed on any stock exchange. Unlisted equities investment can be in the form of direct or indirect investment into infrastructure assets depending on whether equity is invested directly into a project company or an unlisted fund as discussed below:

- a) Direct investments in projects through a Special Purpose Vehicle (SPV) typically involve a long time horizon and a significant capital requirement but are less liquid as compared to listed equities or infrastructure funds. The minimum capital requirement limits investment to this class to large Pension Funds or insurance companies (Bitsch et al., 2010).
- b) Indirect investment via infrastructure funds (private equity-type): These types of funds are also less risky and allow the participation of smaller investors as compared to unlisted direct investments. Infrastructure funds typically invest in more than one project.

2.4.3.3 Debt Finance/Project Finance

Debt finance is a feasible instrument for investors to finance infrastructure projects. As per Figure 6, debt finance can be done either through corporate bonds which are traded on the stock exchange (listed) or direct project financing. Infrastructure companies raise funds for investment in projects via listed or unlisted bonds. Direct borrowing by the project company offers the most direct investment/finance vehicle to the infrastructure project which is similar to the unlisted equities albeit with lower risk profiles. Listed bond financing allows the participation of smaller investors. The time horizon for infrastructure projects is typically between 25 and 99 years therefore funding has a long term tenure spanning 12 to 20 years. Liquidity of lending directly to SPV is, therefore, lower as compared to stock exchange-traded bonds.

2.4.3.4 Preferred Investment Vehicle by Institutional Investors

A survey conducted by Pegin in 2012, as cited by OECD (2014), shows the preferred investment vehicles amongst respondents from institutional investors as depicted in Figure 7. Unlisted funds, direct investment, co-investment and project finance are the most common investment vehicles amongst institutional investors. This observation could be attributed to the unique characteristics of each financial instrument discussed above as well as in section 2.4.4.

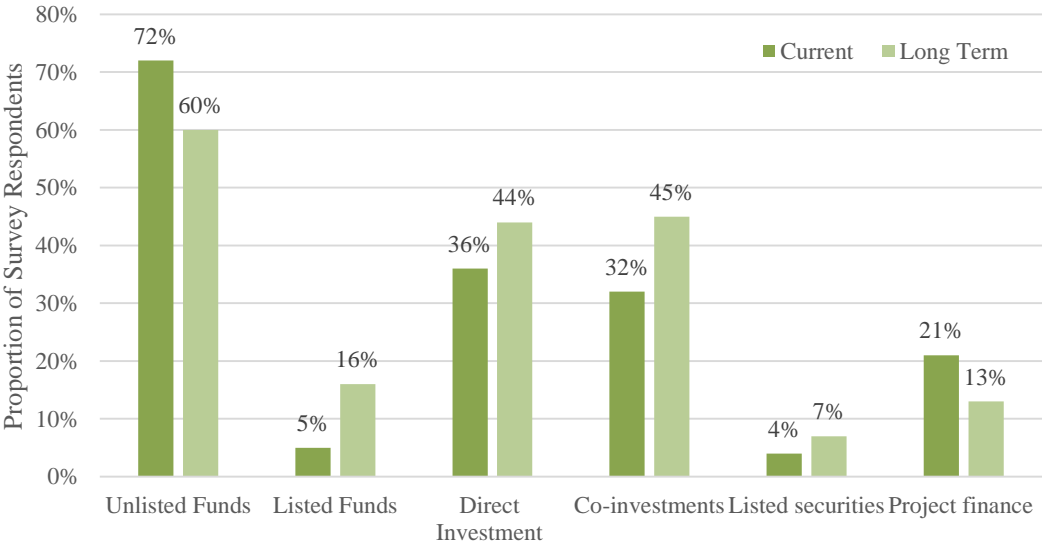


Figure 7: Preferred Financial Instrument
 Source : (OECD, 2014)

2.4.4 Risk-Return Profiles

Infrastructure is a diverse asset class with diverse risk-return profiles and characteristics, as shown in Figure 8. The diverse risk-return profiles provide options for diversification to investors as highlighted in the financial characteristics of infrastructure assets.

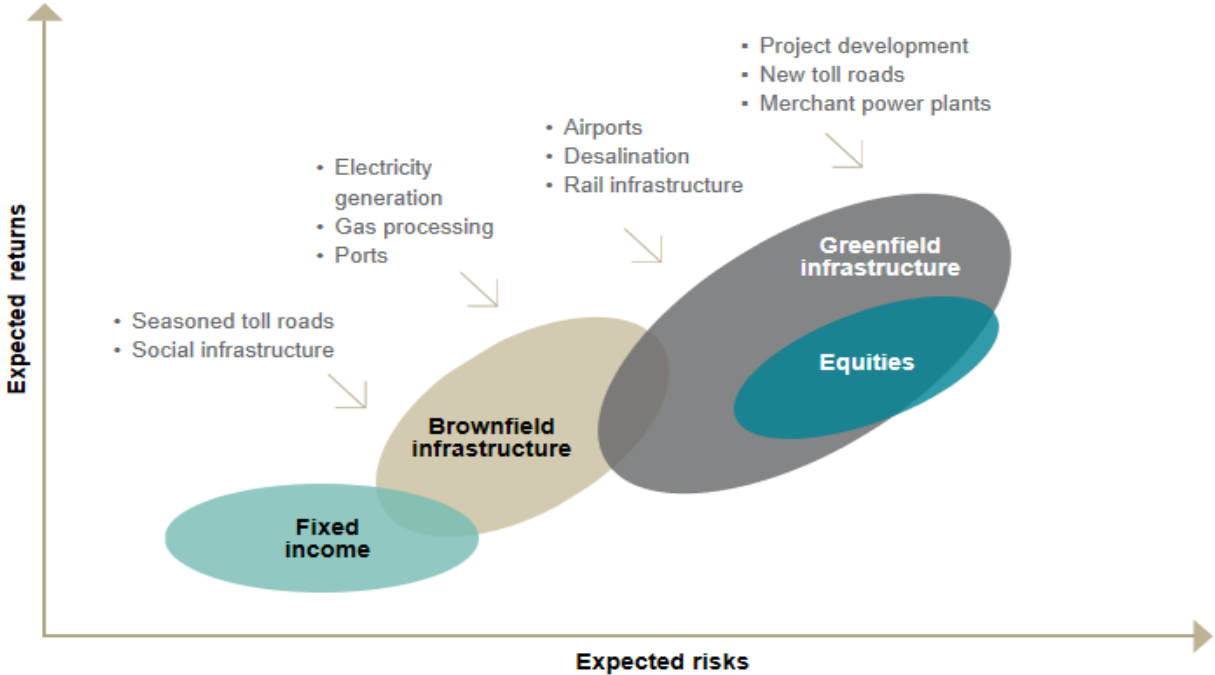


Figure 8: Risk-Return spectrum
 Source: (Inderst, 2010; Russ, Thambiah, & Foscarini, 2010)

Greenfield infrastructures have a wider range of risk-return profiles however, on average, they have a higher risk rating and expected returns as compared to equities. Similarly, Brownfield infrastructures have a wider risk-return spectrum albeit at low risks and expected returns relative to equities. *Greenfield, however, has higher expected risk and return as compared to fixed income.* The wider risk-return profile is expected to match investors’ varying risk and return expectations. Risk-averse investors are bound to find assets that can provide returns that are commensurate with risk exposure. Similarly, risk-seeking investors will find an asset that yields high returns. Risk is thus an important factor that needs to be expanded within the context of infrastructure investment as detailed in a later section, Risk Profiles2.4.4.2) in this chapter.

Table 6: Common forms of infrastructure investment

Source: (Bitsch et al., 2010)

Capital requirement, political and regulatory risk

		Capital requirement, political and regulatory risk	
		Direct	Indirect
Time horizon, liquidity risk	Unlisted	1. Direct investments (PPP; project finance)	2. Unlisted infrastructure funds
	Listed	3. Stocks; bonds	4. Listed infrastructure funds; indexes

The literature on infrastructure investment vehicles can be categorised into four classes (Bitsch et al., 2010). Vällilä (2005) conducted empirical studies on direct unlisted investment vehicles such as Public-Private Partnerships (PPP) and Project Finance while Roedel & Rothballer(2011) and Rothballer & Kaserer (2011) researched direct listed investments, such as infrastructure shares and bonds. The above studies found that, as compared to non-infrastructure shares, the infrastructure asset class has a considerably lower systematic risk and higher firm-specific risk which is driven mainly by demand/market risks (Bitsch et al., 2010). Direct investment is, however, at the end of this spectrum with a long term investment horizon, high liquidity risk, high capital requirement and high regulatory and political risk. The next section covers available literature on infrastructure asset returns and risk profiles

2.4.4.1 Returns Profiles

2.4.4.1.1 Direct investments (PPP and project finance)

The return from direct investment through public-private partnerships and a project finance basis have a relatively high return as compared to the unlisted infrastructure funds due to the fee structure involved with funds (for example, high-performance fees). Although direct investment is possible through consortiums, it can still be prohibitive to small investors who lack the scale to invest in large scale capital projects. This form of investing usually involves a high sunk cost due to the high cost of due diligence and project packaging/structuring. Infrastructure projects of this type are financed mostly through limited resource project finance whereby lenders and equities investors only have recourse to the project assets and cash flows.

2.4.4.1.2 Listed assets: Stocks and bonds

Many studies show that the listed infrastructure companies outperform general companies (Inderst, 2010). Research by Sawant (2010) reveals the high correlation of infrastructure stocks with general stock market indices. The probability distribution of return for the listed stock has a negative skew (increased probability of negative returns) and high kurtosis (“fat tails” which represents a high proportion of outliers). Studies by (Bitsch et al., 2010) show that there is no evidence to conclude that infrastructure assets have more stable returns. Infrastructure bonds offer low volatility (risk) but also low returns as compared to general stock or infrastructure indices (Sawant, 2010a). Additionally, infrastructure project bonds show more stable cash flows compared to non-infrastructure investments (Bitsch et al., 2010; Inderst, 2010; Inderst & Della Croce, 2013).

2.4.4.1.3 Listed Infrastructure funds/indexes

Table 6 shows that listed infrastructure funds typically offer investors the lowest capital requirement and have a shorter time horizon and lower political and regulatory risk. Listed infrastructure funds are diversified hence their performance, relative to the equities/shares, have a lower probability of negative returns (skewedness in the probability distribution of return) and lower proportion of outliers (kurtosis, fat tails). Similarly, the returns on the funds outperform non-infrastructure funds (Bitsch et al., 2010; Rothballer & Kaserer, 2011). The potential disadvantage is that listed funds tend to have a relatively higher correlation to equities as compared to unlisted funds.

2.4.4.1.4 Unlisted Infrastructure funds

Unlisted Infrastructure funds are a form of direct investment where, instead of investing in one project, an investor buys into a portfolio of projects which can be homogeneous or heterogeneous. The risk profile of the unlisted fund differs significantly from direct investment due to diversification effects. The expected returns are slightly lower, due to the fee structure of the unlisted funds. Despite the high fee structure of unlisted investments, they still have higher returns as compared to listed infrastructure and other assets as shown in Table 7. Smaller investors can gain access to unlisted funds due to low capital requirements. Political and regulatory risks are lower while the investment term (time horizon) remains the same (high) and, under “direct investment “, liquidity risk is high.

Additionally, these funds can be either open funds with no time limit or closed-ended with a strict time limit to invest and divest from these assets. Hybrid funds have been created to address the short term nature of funds and can invest across the broad risk-return spectrum (Beeferman, 2008). Open-ended funds tend to have the same characteristics as the underlying assets. They also tend to have lower fees as compared to closed-ended funds. Unlisted funds have a lower correlation with other asset classes (Inderst & Della Croce, 2013) relative to listed equities and bonds.

Table 7: Unlisted infrastructure performance: June 2009.

Source: (Newell et al., 2011)

Asset class	1Y	3Y	5Y	10Y
Unlisted infrastructure	0.05%	9.59%	12.56%	11.53%
Listed infrastructure	-32.04%	-8.85%	2.60%	8.47%
Global listed infrastructure	-29.16%	-0.52%	11.03%	9.04%
Direct property	-7.15%	7.06%	10.76%	10.86%
A-REITs	-42.11%	-23.07%	-8.64%	2.41%
Stocks	-22.15%	-3.76%	6.67%	7.33%
Bonds	10.46%	6.43%	6.66%	6.13%

2.4.4.2 Risk Profiles

Risk is generally defined as any uncertainty associated with outcomes which can manifest at different stages of infrastructure development. Risk is measured in terms of the volatility of returns or stock prices. This section discusses the major risk generally associated with an infrastructure project.

The risk profile changes through the lifecycle of the asset but is highest during the developmental phase when the asset is being constructed, as per Figure 9. The risk, in this specific phase, is referred to as “construction risk” which concerns the likelihood of not achieving the desired quality of construction or not completing the project within specified timelines, cost and performance. The project cost is ultimately the main risk factor because any inadequate work will need to be rectified with further equity injections or increased borrowing. Institutional investors, such as Pension Funds, are highly averse to construction risks and are thus less likely to invest in Greenfield projects. See Figure 9: Project life cycle risks and asset value. Mitigation measures may include the transfer of risk to other parties through Engineering, Procurement and Construction (EPC) wrap type contracts. Due to the risk transfer, the EPC counterparty may charge a significant premium of up to ±30%.

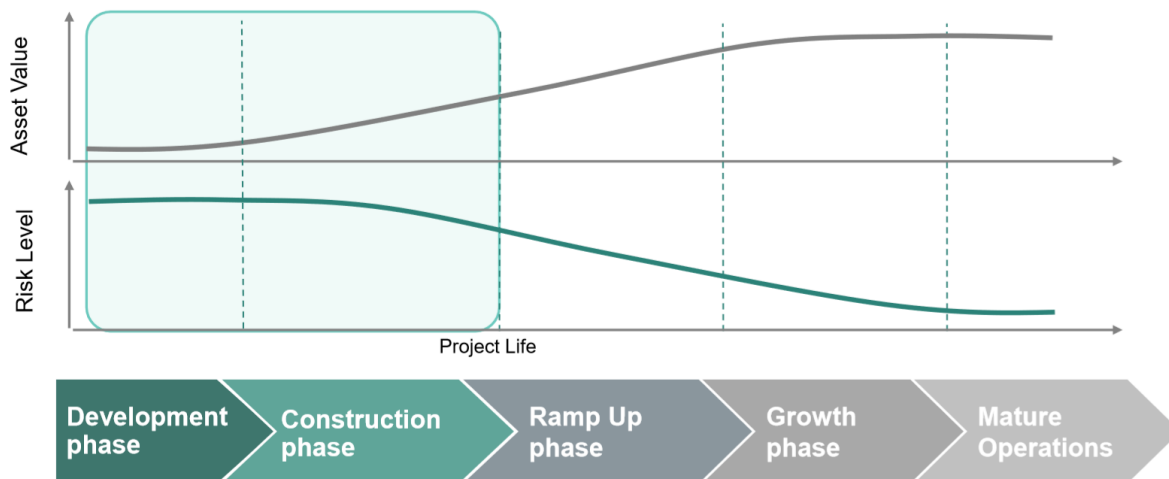


Figure 9: Project life cycle risks and asset value

Source: (Inderst & Stewart, 2014)

Operational and management risks are typically low especially for infrastructure based on proven and mature technology and also because the project has, by this stage, started to generate stable cash flows as shown by a decline in risk level and an increase in asset value (see Figure 9). Institutional investors, such as Pension Funds, are likely to invest in the project during this phase due to the reduced risk level. Business risk (demand, supply factors) occurs during the operation phase of the asset and may arise as a result of the deficit in forecasted sales and revenues. In the power generation sector, for instance, contractual arrangements through the Power Purchase agreement ensure that the power plant utilisation is aligned to the level required for viability. Some projects may require to take or pay commitments from off-takers to make the project viable. Cash flow must, therefore, be sufficient and stable to cover loan repayments to service the debt repayment. Leverage and interest rate risk concerns the asset/company capacity to repay the debt based on the projects' cash flows.

Institutional investors, such as Pension Funds, typically require liquid assets to meet their liabilities when they are due. Infrastructure assets may have low liquidity because infrastructure investment usually entails a long horizon of 25 to 99 years so it may be difficult for an early investor to divest as the market may not be ready or liquid enough. As shown in Table 6, liquidity risks are highest in unlisted direct investments in the form of debt or equity.

Regulatory risk typically covers the entire asset's lifecycle and concerns any regulation that may impact the project during construction and operation. Project developers typically require a sovereign guarantee against changes in laws to protect their investments. Political and taxation risks typically involve factors, such as expropriation or nationalisation, which could affect the

project during the concession period. The tax regime could also be changed with an adverse impact on project financial standing and projections (Beeferman, 2008).

Greenfield projects, such as new roads, bridges and tunnels, are generally riskier due to the construction and political risks and the fact that revenue projections are based on historical experiences as the demand has not been established. Investments in Brownfield projects are less risky as the assets are mature and cash flows are proven (Beeferman, 2008). Reputation risk can arise as a result of failed projects or association with a counterparty that may be seen to be corrupt. An institutional investor would need to have a risk management policy and frameworks that adequately address the risks as part of the general investment activities in infrastructure or project specific risks.

2.5 Pension Fund Investment Models into infrastructure Projects

The researcher perceives Australian and Canadian Pension Funds as pioneers and leaders in the field of infrastructure investments since the early 1990s. Institutional investors, including Pension Funds, are attracted to infrastructure assets because of the promise of higher and more stable returns through diversifying their portfolios and finding a better match to the fund's long-term liabilities (Beeferman, 2008; Della Croce & Yermo, 2013). This section discussed the literature on Pension Fund investment in infrastructure and barriers to increased investments.

2.5.1 Comparison between the Canadian and Australian model

Australian and Canadian Pension Funds have by far the largest asset allocation ($\pm 5\%$) globally (Croce, 2011). This section compares and contrasts the experiences of Australian and Canadian Pension Funds in infrastructure investment and the lessons that can be learnt by global Pension Funds, including those in Namibia, based on the research by Inderst and Della Croce (2013). The following are observations regarding the characteristics and experiences of Pension Funds' investment in infrastructure in Australia and Canada:

- a) The development of infrastructure in both countries is the responsibility of both the state and the federal government. The different levels of government plan and coordinate investments for infrastructure development. Infrastructure projects in Canada are traditionally financed using public funds.

- b) The majority of Pension Funds in Canada consist of Defined Contribution funds while, in Australia, they are mainly defined benefit or superannuation funds. The two systems further contrast in the funding levels as Australia is well funded and growing fast while the Canadian funds are widely regarded as underfunded. The characteristics of Brownfield projects are deemed suitable for matching the DB fund liabilities due to the low-risk exposure and long term stable and inflation-linked returns.
- c) Both countries have largely fragmented systems with a large number of small Pension Funds and also some that are on a global scale. Some of the large funds in both countries are amongst the biggest funds in OECD countries. The study finds that the size of the fund is crucial for investment in illiquid assets such as infrastructure. The larger funds tend to have higher asset allocations to infrastructure assets.
- d) The PPP policy in both countries is very mature. In Australia, the PPP policy has evolved in terms of the transfer of demand risk from the private sector to the public sector for Greenfield projects. However, in Canada, the privatising of public assets is not popular. The few privatised assets operate on a “not-for-profit” strategy and, despite this, they are still able to raise financing on the market with bond issuing, etc.
- e) Asset allocation to infrastructure averages 5%; however, larger funds allocate a higher percentage relative to the scale of the fund, risk tolerance and the long term outlook of these funds. This finding corresponds with research into trends in large Pension Fund investments in infrastructure, which found that large Pension Funds in mainly developed countries have a specific asset allocation to infrastructure (Della Croce, 2012).
- f) Australian Pension Funds outsource their investment activity (fund management) to external fund managers. The funds prefer open-ended investment vehicles; however bigger funds are venturing into direct investing into infrastructure assets/projects. Additionally, investment has largely been in the form of equity even though debt financing has been growing in recent years.
- g) Similarly, in Canada, infrastructure investing is done through listed equities/shares; however, debt financing is also on the increase. The mature bond market also allows the fund to invest in bonds of infrastructure companies or general infrastructure bonds. Most of the infrastructure investments of Canadian investment funds are destined for the overseas market because the government largely abstains from large scale privatisation of infrastructure assets. The preferred financial instruments have been mainly closed-ended funds, direct investment and co-investments, which correspond to observations by OECD (2014) as shown in Figure 6.

2.5.2 Barriers to Pension Fund investments

Studies conducted by Beeferman(2008); Ehlers(2014); Inderst(2010); Inderst and Della Croce(2013) and Thierie and Moor (2016) identified various challenges that institutional investors encounter in infrastructure investing. The lack or shortage of financing cannot be the main impediment to increased infrastructure investment. Ehlers (2014) argues that infrastructure investment is lagging despite an ample potential supply of long-term investments from institutional investors (such as Pension Funds, insurance companies and other Development Financial Institutions) and high infrastructure bottlenecks that exist both in developing and developed countries. Government has stopped investing in infrastructure due to concerns about affordability and negative public reaction to the raising of taxes to fund infrastructures (Beeferman, 2008). The following section compares and contrasts the challenges identified by the above researchers and the possible implications for Pension Fund investments in infrastructure projects in Namibia as these barriers need to be considered within the context of a specific country.

- a) **A limited supply of projects and high costs of bidding:** There is a limited supply of projects that are suitably structured and readily bankable. The lack of a project pipeline can be attributed to several factors, firstly, a lack of expertise in project structuring or project development especially concerning big capital projects. The high costs of expertise involved in complex legal and financial arrangement necessary for infrastructure investment can be prohibitive if there is not a sufficient and predictable pipeline of infrastructure projects (Ehlers, 2014). Bidding costs can be high and if there is no steady stream of projects that can increase investors or developers' chances of success, this can be a deterrent to potential developers. The Renewables Energy Independent Power Producer Procurement Program (REIPPPP) in South Africa has succeeded through reducing the transaction costs by procuring generation capacities of the different renewable projects over several bidding rounds. The IPP tariff has come down successively over the various rounds (Eberhard et al., 2014) of competitive bidding for generation capacity using specific renewable energy technologies. Investors who failed in the initial round have other opportunities to bid in successive rounds thus increasing their chance of success and lowering the transaction costs involved in bidding for renewable energy capacity with different technologies.

The lack of a project pipeline can also be attributed to a lack of funding for project development and feasibility studies. Institutional investors, such as Pension Funds, may be unwilling to fund a project at an early stage when the risk is significantly higher. Venture capitalists, philanthropic investors or Development Financial Institutions (DFIs) are crucial in unlocking the private sector investment by providing Catalytic First Loss Capital required for feasibility studies and the project development activities.

- b) **Infrastructure investments are too risky** due to the lack of a legal framework. A coherent and trusted legal framework in the form of public-private partnerships (PPPs) and public procurement policies are a necessity for infrastructure investment. PPP policies need to clearly outline the risk allocation between the public and private sector. The Australian PPP policy advocates for demand/market risk to be allocated to the public sector as it encourages higher participation by the private sector in PPP projects. The REIPPPP program has developed a standardised set of bidding documents which, when combined with the different rounds of bidding, have encouraged investors and developers' participation. The standardised bidding document includes the Implementation Agreements, Direct Agreements and the Power Purchase Agreement. The involvement of construction companies, operators, government authorities/regulators, private investors, insurers and project customers/beneficiaries results in complexities that make it vital to design an efficient set of contracts or bidding documents.

Risk allocation, as part of the PPP policies, is also a barrier to infrastructure financing and developing. The PPP policies should aim to have a fair risk allocation between the private and public sectors under the principle of allocating risk to the best party able to manage it. Unfair risk allocation may make certain projects unbankable or lead to an increase in the cost of services that the infrastructure is meant to provide (Ehlers, 2014). Guarantees for political force majeure events are examples of risks that are allocated to governments. Allocation of this risk to the private sector will merely force it to obtain private risk insurance (PRI) which comes at a cost to the project and the end consumers. Payments to PPP projects should be structured to encourage private sector participation and the efficiency that comes with the private sector involvement in the provision of public goods or services. Governments need to develop mechanisms to guarantee foreign investment as well as credit enhancement tools to support public entities in contractual arrangements with the private sector.

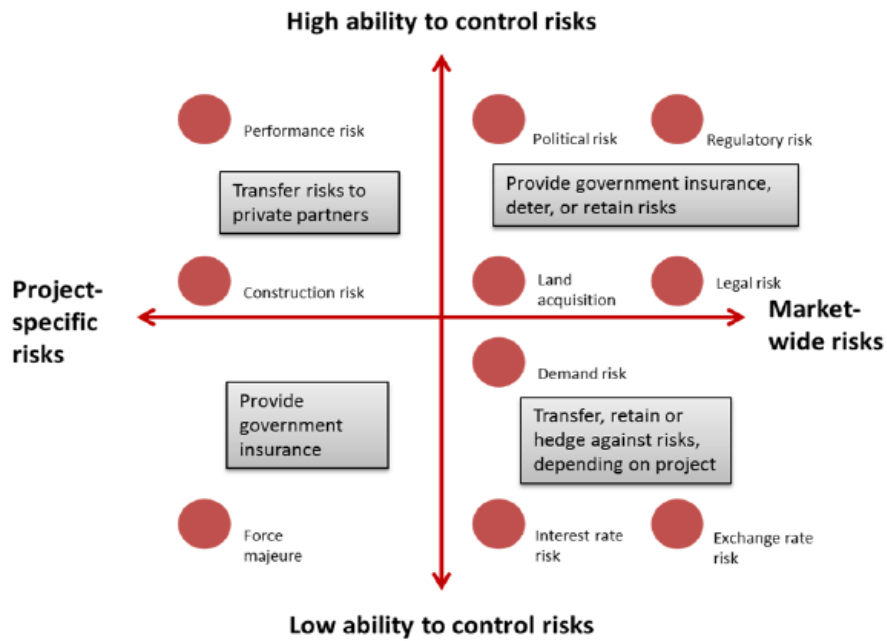


Figure 10: Risk Allocation and Transfer in PPP Projects

Source : (Ehlers, 2014)

Political and Regulatory issues/risks may include changes in governments, infrastructure and tax policies or uncertainties about carbon pricing and renewable energy initiatives. A different government may have different priorities depending on the electoral promises made during election campaigns. A government guarantee is one such remedy for political and regulatory risks; however, this can be detrimental to a country's financial standing and capacity to borrow. Governments are increasingly unlikely to issue traditional on-demand and unconditional guarantees due to the effect that they have on their ability to borrow and fund critical areas such as social services. Infrastructure projects can be profitable to the economy as a whole however they may not be profitable on their own or because the political and regulatory risks are too costly to insure (Ehlers, 2014). Government support, in the form of either direct financial support or some of form of insurance (guarantees), is needed to provide comfort to the project developers that firstly, the infrastructure is needed and welcomed and, secondly, it will receive the necessary regulatory support.

Greenfield projects have significant construction and patronage risks and are only profitable after many years of operation and after a significant portion of the debt has been repaid. Many institutional investors prefer to invest in Brownfield projects whose demand, revenue stream and profitability is known. Project developers and promoters thus need to

develop a mechanism that appeals to risk-averse investors who may be attracted to the long-term nature of the infrastructure project but adverse to early-stage risks such as construction risks.

- c) **Short-termism:** Due to the nature of the funds, some investors may have a tendency towards short-termism which may not be favourable to long-term investing. The short-termism may be dependent on whether the fund is a DB or DC.
- d) **Liquidity and valuation issues:** Infrastructure assets inherently have low liquidity. Pension Funds are cautious about holding highly illiquid assets and thus tend to allocate a very small percentage to this asset class. Liquidity requirements hinder increased infrastructure investment as funds must maintain adequate liquidity which can be attained primarily through listed equities and bonds. Furthermore, open funds can face challenges with valuations since high volumes flowing in and out of the funds can be experienced during high market volatility periods.
- e) **Alignment with investment strategies:** Funds vary in term of asset valuation, degree of openness and whether it is classified as a Defined Benefit (DB) or Defined Contribution (DC), which defines the nature of the liabilities. Members from DC funds may have greater choice in terms of the risks of their investment/savings and their impact on investment strategies. A range of long-term products and investment profiles is thus required to enable access by investors of different sizes and risk preferences. Differing investment strategies may make it difficult for infrastructure assets not only to compete with international infrastructure investment opportunities but also with all other asset classes.
- f) **Scale, resources and investment expertise:** Infrastructure is inherently complex, with high capital requirements and long investment periods. Most of the Pension Funds are not large enough in term of assets to have sufficient governance structures, management and operational resources (Inderst, 2010). The funds can outsource investment activities to external fund managers; however, this does not negate the need for in-house expertise on infrastructure investments. Empirical findings suggest that larger Pension Funds have a higher than average asset allocation to infrastructure relative to smaller Pension Funds. Large Pension Funds, due to their scale, can afford to recruit in-house resources as the level of infrastructure investment can justify the cost involved.

The combination of the above factors can create a suboptimal investment environment for infrastructure by institutional investors, such as Pension Funds.

2.6 Summary of the Chapter

A Pension Fund's main purpose is to provide an income to beneficiaries during retirement when they are no longer able to work. Beneficiaries and employers contribute premiums to registered Pension Funds which are invested prudently to ensure savings grow in the long-term. NAMFISA regulates Pension Funds in Namibia. The Namibian Pension Funds industry holds significant assets under management which are equivalent to approximately 90% of Namibia's Gross Domestic Product (GDP) with most of the Pension Funds' assets invested abroad. The assets of the Pension Funds can be a catalyst for development especially of infrastructure assets for the benefit of local beneficiaries and the nation at large.

State and state-owned enterprises dominate the development of infrastructure as evident with NDP5. Traditionally sources of financing are debt financing, user fees and government subsidies respectively. Funding plans for NDP4 and, by extension, NDP5, forecast a funding shortfall of approximately N\$ 150 billion. Alternative sources of finance for infrastructure need to be investigated in light of the significant funding gap and the fact that institutional investors, such as Pension Funds in Namibia, are a viable source of finance. Although the Pension Funds possess significant financial muscle, not all these resources can be invested in infrastructure assets but rather in a diversified portfolio of assets including infrastructure.

Infrastructure is defined as a set of public works which may include roads, utility lines and public buildings which can be further split into economic and social categories. Despite the inherent heterogeneity, infrastructure is a unique asset class which is different from properties and other asset classes. Economic characteristics, such as high barriers to entry, economies of scale, inelastic demands for goods and services, long concession durations and financial characteristics make infrastructure finance attractive to a range of investors because of their favourable returns, low sensitivity to economic swings, low correlation with other asset classes, long term stable return, good inflation and low default rates. The range of economic and financial characteristics is not uniform but manifest at varying degrees depending on the specific structuring of the infrastructure project or asset. The investment vehicles can range from direct to indirect and from over-the-counter (unlisted) to listed instruments with varying levels of risk-return profiles to investors.

Furthermore, investment vehicles have different features in terms of investment horizons, liquidity risks, capital requirements and political and regulatory risks that need to be carefully evaluated in choosing the investment vehicles and appropriate financial instruments (debt or equity). The inherent heterogeneity of infrastructure translates into a wider risk-return spectrum, ranging from low risk and low return to high risk and high return. The risk profile is affected by many factors which range from construction risks to operation and maintenance risks. The overall risk profile of an infrastructure asset varies throughout the asset's lifecycle. Institutional investors, such as Pension Funds, are viewed as natural investors in infrastructure as their long-term liability matches perfectly with the financial characteristics described above.

Australia and Canadian Pension Fund industries are leaders in terms of investing in infrastructure development with the highest percentage of investment in infrastructure relative to the overall fund size. The industries are inherently different as Australian Pension Funds are mainly categorised as Defined Benefit (DB) while Canada's are Defined Contributions (DC). Differences also arise in terms of the financial instruments or vehicles utilised in the two countries with Australia mastering PPP procurement processes while Canadian investment has been mainly through listed equities and bonds. The lesson from the Australian and Canadian Pension Fund industries presents numerous obstacles which hinder higher participation in infrastructure finance. These challenges include, amongst others, a lack of project pipeline, an inadequate legal framework for PPPs, unfair or inappropriate risk allocation in PPP projects, high political and regulatory risks, short-termism, varying investment strategies and a lack of internal resources and expertise in Pension Funds to manage infrastructure investment in-house. The combination of the above factors can create a suboptimal investment environment for infrastructure, especially in developing countries, such as Namibia, where financial markets and regulatory environments are not fully developed.

CHAPTER 3: Research methodology

3.1 Introduction

This chapter provides an overview of the research design followed in conducting the research and addressing the research questions and objectives. This section aims to provide information on the appropriate philosophy and the implementation of the research. This chapter comprises five sections, (i) the research approach which relates to the philosophy that was employed; (ii) the unit of analysis, population and sampling approaches in terms of data gathering, formatting and sampling techniques used in data collection; (iv) the data collection process that covers the methodology of administering the questionnaire, the analytical framework that addresses how the data were organised and analysed to reach a meaningful conclusion; and (v) the approach that was employed to ensure the internal validity and reliability of the research findings.

3.2 Research Approach

The design of the research was both exploratory and descriptive due to the nature of the research questions and objectives. The research philosophy employed aimed to validate the findings from previous researches concerning the topic in the Namibian context as well as to identify any other factors that may impede greater investment by Pension Funds. The philosophy employed necessitated the use of a mixed-method research approach which was a combination of quantitative and qualitative research approaches. The mixed-method approach was warranted by the fact that previous studies by Beeferman (2008); Bitsch (2012); Della Croce & Yermo (2013); Ehlers (2014); Inderst & Stewart (2014); Thierie & Moor (2016) have proven that the topic under investigation is multi-dimensional and by the need to guarantee the validity and reliability of research methods and findings. A purely qualitative or quantitative approach is inherently biased and could be neutralised by using both methods (Creswell, 2003). The purpose of this research was to understand what, how and why Namibian Pension Funds only make negligible investments in infrastructure, which necessitated a mixed-method approach (Hesse-Biber & Johnson, 2015).

Two designs could be used for data collection in a mixed-method research approach, firstly a convergent parallel design where qualitative and quantitative data are collected simultaneously.

Secondly, an explanatory and exploratory sequential design where either qualitative or quantitative data are collected first depending on which aspect is the driving component. The convergent parallel approach was selected for this research to provide a comprehensive understanding of the problem statements and answer the research question and objectives. The qualitative data were collected simultaneously with quantitative data as part of the questionnaire. Survey participants were required to substantiate their responses to the questions which formed the qualitative aspects of the questionnaire.

The combination of qualitative and quantitative methods also helped to adopt a multi-faceted and deeper understanding of the issue under investigation. The research approach also subscribed to the positivist philosophy, which restricts the researcher's role in data collection and interpretation. Positivism philosophy has been found to lead to findings that are observable and quantifiable. The segregation of the researcher's subjectivity from the topics being investigated presents the main challenge to positivist philosophy as the two aspects are increasingly intertwined especially when the researcher analyses and summarises the findings.

3.3 Unit of analysis, population, sampling technique and sample size

The target population consisted of representatives of Pension Funds, such as administrators, principal officers and Investment Managers including asset/fund managers and infrastructure investment analysts who are traditionally involved in managing Pension Fund assets and investing in infrastructure. Primary data were collected through the use of a questionnaire that was administered to the sample group. The questionnaire collected data in both quantitative (nominal, ordinal and ratio scale) and qualitative data formats. The research aimed to analyse industry practice about individual Pension Funds and asset managers which was summated to adopt a view of the industry as a whole. The participants in the surveys were divided into two separate groups, one consisting of Pension Fund principal officers, administrators and trustees and the other group comprising asset/fund managers and infrastructure financing specialists. Information on the population of Pension Funds and asset managers was sourced from the financial institution regulator, NAMFISA.

The samples from the first group (Pension Fund) were selected using a probabilistic method based on the stratified random sampling methods to reduce bias whilst the sample from the second group (Investment Managers and Unlisted Investment Managers) was selected using a

simple random sampling technique. Both groups of respondents were subject to the qualitative and quantitative aspects of the questionnaire. A sample is defined as a portion, segment or a piece that is representative of the whole (population). The research sample consisted of 13 respondents representing four (4) Pension Funds, four (4) respondents representing four (4) Investment Managers and one unlisted Investment Manager Respondent from the population listed in Table 28, Table 29, and Table 30 in Appendices B, C and D respectively. Both groups were subjected to the questionnaire in Appendix A1 which consisted of a combination of qualitative and quantitative questions which is standard in a mixed-method research approach. As reviewed in section 2.2, the Pension Fund industry is dominated by a few funds that account for more than two-thirds of the assets; therefore, the stratified random sampling ensured an accurate representation of the industry in the sample. The Pension Funds were categorised into strata according to the assets under management as follows:

Category 1: N\$ 0–250 million;

Category 2: N\$250 million – 1 billion;

Category 3: N\$ 1 – 3 billion;

Category 4: > N\$ 3 billion

3.4 Data collection process

The data collection processes followed a convergent parallel approach as the qualitative and quantitative aspects were part of the questionnaire as detailed in sections 2.5.2 and 3.4. The primary data were obtained by administering the questionnaire to fund managers and principal officers for each sampled Pension Fund and Investment Managers' representatives. The questionnaire was structured based on the findings in the literature particularly the challenges that have hindered Pension Fund investments in infrastructure as detailed in section 2.5.2. Figure 11 below maps out the questions to the factors alluded to in the literature review, more specifically section 2.5.2. Research participants completed the survey via a web portal which is designed in accordance with questionnaires for both Pension Fund and Investment Manager Respondents as shown in Appendix A. As per the positivism approach discussed above, the role of the researcher in the data collection processes were limited to clarification of questions in the survey.

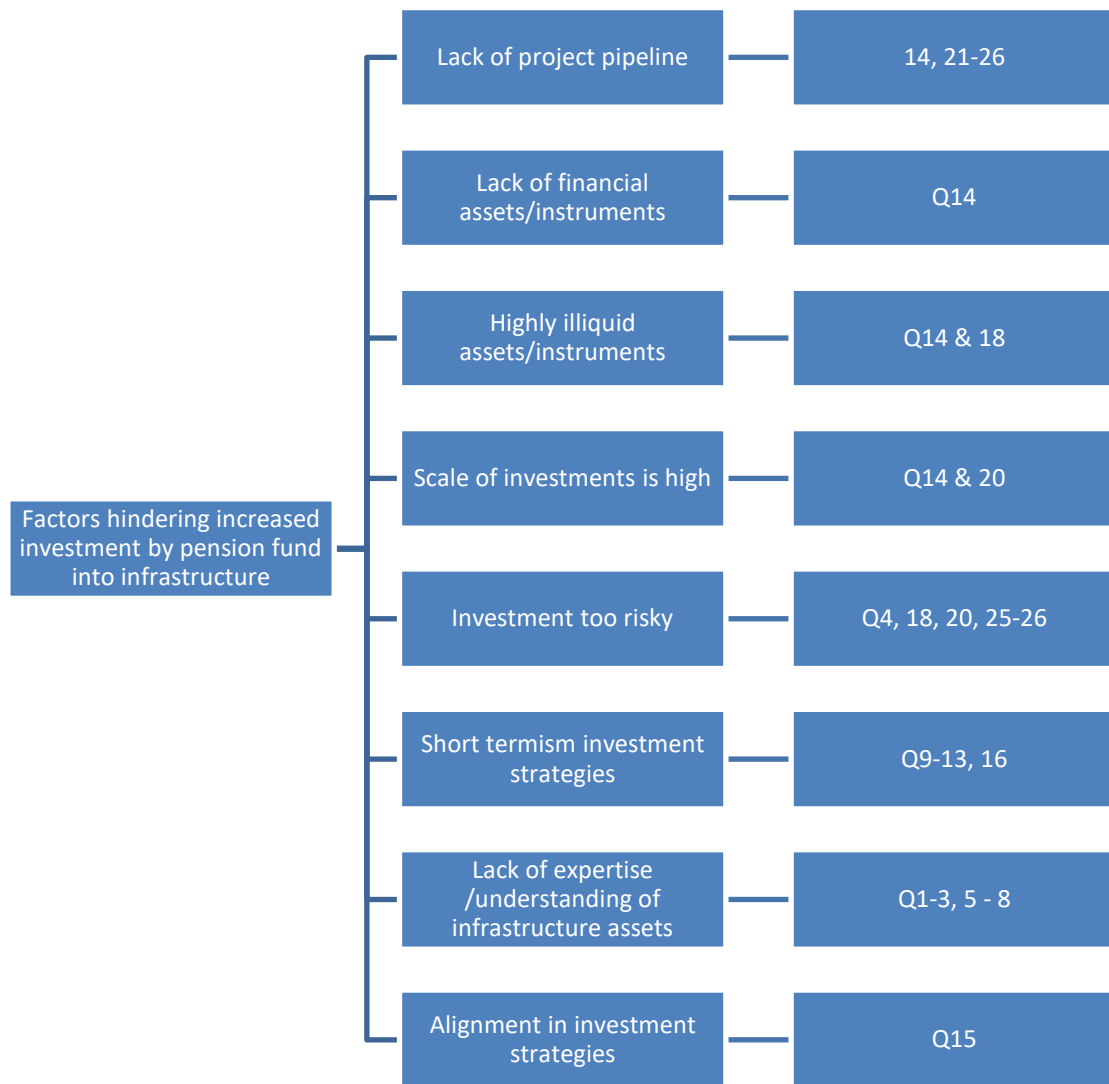


Figure 11: Barrier – questionnaire enquiry linkages

3.5 Data Analytical Framework

The goal of this research was to test existing theoretical frameworks as well as unearth new perspectives in the Namibian context. Given the mixed-method approach, the analysis followed a combination of deductive and inductive methods as necessitated by the qualitative and quantitative data. Both qualitative and quantitative data were analysed per sample group and summated to form a view on the industry as a whole and answer the research questions and meet the research objectives. Quantitative data were analysed primarily using the descriptive techniques and factor analysis to confirm which factors (questions and responses) are significant. In factor analysis, factors contribute significantly or regarded as important if their factor scores/weight is greater than or equal to 0.5, either positively or negatively. In factor

analysis, there are typically as many factors as there are variables, however, only factors whose eigenvalues are greatest and above one(1) account for the most variability and thus use in the analysis in Chapter 4.

The questionnaire's reliability and internal consistency were tested using the Cronbach's Alpha Coefficient with the aid of Microsoft add-in XLSTAT. The dichotomous variable was transformed to a Likert scale chart with a scale of 1–5, where a YES (1) translated to a four (4) and NO (0) translated to a two (2) to allow an internal consistency test of a continuous variable using the Cronbach Alpha test. Tests for sample adequacy were carried out using the Kaiser-Meyer-Olkin (KMO).

Qualitative data analysis is a technique for methodically describing the meaning of qualitative data and aims to bring order, structure and meaning to data (Flick, 2014). The research employed a narrative analysis in the evaluation of the primary qualitative data provided in the questionnaire. The narrative data analysis aimed to compare and contrast research participants' experiences within the context of existing theoretical frameworks covered in the literature review. Research participants provided a qualitative response to justify their answers. The analysis focused on the data to help in answering the research question. The key narratives and themes observed in the data collected were compared and contrasted against existing theoretical frameworks in arriving at the conclusions, answering the research questions and satisfying the research objectives.

3.6 Validity and reliability

Saunders et al. (2007) discussed the following pitfalls that could undermine the credibility of research findings. These measures are taken to guarantee the research findings' validity and reliability.

Construct validity typically originates from the lack of sufficient data measurement points or the use of subjective judgement to collect data. To address the concerns, the researcher established a causal relationship between the concept and the study objectives based on existing literature. As highlighted with the requirement of the positivist approach, which aims for objective interpretation, the researcher is fully cognisant of the risk of subjectivism during data

collection and analysis and endeavoured to eliminate any bias. The sample size was determined to attain high confidence of 99% to ensure that the construct validity was not compromised.

Internal validity typically concerns establishing causal relationships between different facets of the research to lend the research internal validity. The concepts and frameworks to be tested in the Namibian context have been well researched in another setting, so the relationship to the research questions and objectives has been established.

External validity concerns the degree to which the research findings can be generalised or applied to other research settings (Saunders et al., 2007). It will not be required to extrapolate the research findings to other settings as the findings are from a specific context. The research findings may apply to another scenario however they must still be validated in that specific context. The literature review, which forms the basis for data collection and analysis, was based on studies in similar settings so the causal relationships between concepts and research objectives have already been tested.

Reliability concerns the extent to which data collected using this technique yielded consistent findings. The reliability can be assessed by addressing the following questions:

- i) Will the survey yield the same findings on a different occasion?
- ii) Will comparable observations be reached by other observers?
- iii) Is there transparency in terms of how the raw data are interpreted?

The researcher aimed to investigate the topic systematically as discussed in the research method and methodology to guarantee the reliability of the study. The researcher's knowledge and experience are crucial to ensuring the reliability of the findings especially when it concerns the qualitative data collection and interpretation aspects of the research.

CHAPTER 4: Findings and data analysis

4.1 Introduction

This chapter presents an overview of the research findings and data analysis based on the qualitative and quantitative research methods discussed in Chapter 3. The chapter consists of the six (6) sections: (i) an introduction; (ii) review of profile of survey respondents, (iii) review of factor analysis results, (iv) a review of Pension Fund attitudes toward infrastructure as an asset class; (v) a review of factors hindering Pension Fund investment in infrastructure; and (vi) the impact of Pension Fund regulation on infrastructure investing. The survey results have been classified in the categories presented in sections 2.5.2 and 3.5 and widely attributed as barriers to Pension Fund investment in infrastructure.

4.2 Profile of Respondents

Table 8 displays high-level profiles of respondents that were sampled and surveyed as part of data collection processes. Appendix E shows the survey responses, and coded responses for the Investment Manager and Pension Fund questionnaires respectively. The survey participants account for a significant portion of assets for both the Pension Fund and Asset Management (Investment Manager) Industry. The observation made as part of the analysis that follows may, as a result, apply to the entire industry,

Table 8: Respondent Profiles

	Investment Manager	Pension Fund
Number Of Respondents	13	4
Number Of Institutions	4	4
Assets (N\$)	81 Billion	130 Billion
Smallest Assets	350 Million	150 Million
Largest Assets	40 Billion	110 Billion

4.3 Factor Analysis Results

Factor analysis results for both the Pension Fund and Investment Manager sample groups are shown in Table 9. Factor Analysis result yielded a total of seven latent factors for Pension Fund sample group and two latent factors for Investment Manager respectively. The eigenvalue

measures how much variance observed in variables can be explained by the factor. Factors with eigenvalues greater than or equal to one (1) account for more variance than a single observed variable. The internal consistency of the construct and questionnaire is measured by mean of a Cronbach's alpha test. Any Cronbach's alpha value above 0.5 is generally acceptable but considered “poor” if below 0.6. Similarly, Cronbach's alpha value of greater than or equal to 0.6 is considered an indication of good internal consistency of the construct. Sample adequacy is established with the use of KMO test, whereby value above 0.5 is acceptable however only values above 0.6 are considered an indicator of good sample adequacy. Pension Fund factor analysis results reveal that five (5) latent factors have eigenvalues and Cronbach's alpha below the 1 and 0.5 thresholds and therefore were not used in any further analysis. The eigenvalue and Cronbach’s alpha value for the first two latent factors (F1 & F2) as shown in Table 9 are well within the acceptable range. F1 scores carry a greater weight and importance as compared to F2 as it accounts for higher variability in the latent factor. F2 factor scores only supersede F1 scores only when F1 scores are not significant and when F2 scores are significantly greater than F1 scores. The KMO test result of 0.57 is at the bottom end of the acceptable scales which indicate poor sample adequacy. The cumulative variability explained by the first two factor is below 50% which may be due to poor samples adequacy (KMO) test result of 0.570. Table 10 shows the KMO measure of sampling adequacy results for observation from individual respondents which confirms that all respondents’ observations except respondent K met the KMO test for sample adequacy of 0.5.

Similarly, the Investment Manager factor analysis results yielded two latent factors of which only one (1) have an acceptance eigenvalue and Cronbach's alpha value as shown in Table 9. The KMO test for sample adequacy results is well within the acceptance range of the scale. F1 account for 56% of the variability observed. The analysis of factor scores for all variables is discussed in section 0, 4.5, and 4.6 and mostly focus on Factor 1(F1) and Factor 2(F2) for Pension Funds and Factor 1(F1) for Investment Manager sample groups respectively. A factor score is a numerical value that indicates a variable’s relative importance on a latent factor. Only factor scores above 0.5 are regarded as significant or important on a latent factor.

Table 9: Factor Analysis Results Summary

		F1	F2	F3	F4	F5	F6	F7
Pension Funds								
KMO	0,57							
Eigenvalue		3,678	2,199	0,93	0,48	0,29	0,17	0,07
Cronbach's Alpha	0.779	0,809	0,669	-0,08	-	-	-	-
Average Variance Explained		28,3%	16,9%	7,2%	3,7%	2,2%	0,9%	0,5%
Cumulative variability (%)		28,3%	45,2	52,4%	56,1	58,3	59,2	59,7
Investment Manager								
KMO	0,797							
Eigenvalue		2,818	0,245	-	-	-	-	-
Cronbach's Alpha	0,870	0,862	-	-	-	-	-	-
Average Variance Explained		56,4%	4,9%	-	-	-	-	-
Cumulative variability (%)		56,4%	61,3					

Table 10: Kaiser-Meyer-Olkin Result for individual respondents

Respondents	Pension Funds	Investment Manager
A	0,791	0,874
B	0,523	0,869
C	0,523	0,737
D	0,523	0,728
E	0,761	0,853
F	0,745	
G	0,629	
H	0,548	
I	0,561	
J	0,716	
K	0,488	
L	0,63	
M	0,61	
Overall	0,570	0,797

4.4 Pension Fund attitudes toward Infrastructure as an asset class

As highlighted in the literature, the infrastructure asset class is a natural match for the Pension Fund and Pension Fund liabilities. The survey reveals that a slight majority (53%) of respondents representing Pension Fund principal officers and administrators do not consider infrastructure as a unique asset class with distinct economic and financial characteristics. This variable (Pension Fund attitude towards infrastructure as a unique asset class with distinct economic and financial characteristics) has a significant negative factor (F2 Scores) loading which confirms that Pension Fund does not recognise infrastructure as a separate asset class.

On the contrary, 100% of respondents representing Investment Managers view infrastructure as a unique asset class as confirmed by F1 factor scores, which shows that these criteria contribute positively and significantly to the underlying factor, as depicted in Table 11. The diverse views between the Pension Funds and Investment Managers on infrastructure as an asset class highlight the degree to which Pension Fund principal officers and administrators are involved in formulating investment policies, active management of Pension Fund assets and their dependency on external consultants and specialists in developing investment policies and managing investments. A few Pension Fund respondents acknowledged infrastructure as a unique asset class mainly due to feature such as (i) attractive returns, (ii) low correlation of infrastructure to other asset classes and (iii) long term stable and predictable returns, however, neither of these factors contributes positively on any factors scores (F1 and F2) as shown in Table 12.

Table 11: Factor Score and Descriptive Statistics for “Attitude towards infrastructure as a unique asset class with distinct economic and financial characteristics?” variable

Bold value denotes significant variables

	Yes	No	F1	F2
Pension Fund	46%	54%	0,36	-1,584
Investment Manager	100%	0%	1,40	

Based on Investment Manager factor analysis results in Table 12, the following three variables contribute positively(F1) towards the underlying factor; (i) stable returns, (ii) long term stable and predictable returns, and (iii) good inflation hedged returns.

Table 12: Factor Score and Descriptive Statistics for “Infrastructure's financial and economic characteristics” variables

Bold value denotes significant factors

	Investment Manager		Pension Fund		
	% Response	F1	% Response	F1	F2
Attractive Returns	40%	0,437	50%	-0,099	-0,856
Stable (Low Sensitivity To Economic Cycles) Returns	80%	1,121	50%	-0,407	-0,178
Low Correlation With Other Asset Classes(Diversification Potential)	20%	-0,244	50%	-0,319	-0,937
Long Term Stable And Predictable Returns	60%	0,737	50%	-0,478	-0,004
Good Inflation Hedged Returns	80%	1,121	33%	-0,646	0,272
Low Default Rate	40%	-0,03	17%	-0,698	0,275
High Barrier To Entry	20%	-0,176	17%	-0,698	0,275

Sampled Pension Fund respondents with a positive view on infrastructure asset class maintain a target asset allocation as part of investment policy that ranges between 1.5 and 2.5%. These findings validate reported statistics in Table 2 which show that actual disbursement toward the unlisted investment of 0.7% is below the minimum requirement of 1.75%. Based on the reported statistic by NAMFISA and information provided by respondents as part of the survey, respondents recognise that Pension Fund investment in infrastructure is below best practice standards of 10 to 15% set by Pension Funds in Canada and Australia respectively.

F1 scores for Pension Fund respondents, shown in Table 13, reveal that variables, such as (i) high capital requirement and (ii) low liquidity have a positive and significant loading meaning that these variables make infrastructure unattractive. F1 score for other variables has negative scores meaning they do not influence the attractiveness of infrastructure assets. This confirms earlier findings that Pension Funds largely do not recognise infrastructure as a unique asset class due to factors such as perceived low liquidity and high capital requirement. F1 scores for Investment Managers factor analysis results revealed that all variables listed in Table 13 have a negative and significant score, which implies that these variables do not contribute to making infrastructure asset unattractive. The results confirm earlier findings that Investment Manager Respondents find infrastructure assets largely attractive and recognise infrastructure assets as a unique asset class.

Table 13: Factor Score and Descriptive Statistics for “Infrastructure features that are not attractive to investors” variables
Bold value denotes significant factors

	Investment Manager		Pension Fund		
	% Response	F1	% Response	F1	F2
Low liquidity	20%	-0,30	100%	1,514	0,497
investment too risky	0%	-0,56	29%	-0,399	-0,352
Long investment horizon	0%	-0,56	14%	-0,683	0,247
Lack of financial instruments	0%	-0,56	14%	-0,683	0,247
High capital requirement	20%	-0,30	71%	1,013	1,391
Not applicable	0%	- 0,56	14%	-0,716	0,243

4.5 Factors hindering Pension Fund investment in infrastructure

4.5.1 Lack of project pipeline

An overwhelming majority of the Investment Managers (80%) and Pension Funds (77%) indicated that there is no steady stream of bankable infrastructure projects/opportunities in Namibia. As shown in Table 14, F2 scores revealed that this variable has a negative factor loading for both Pension Fund and Investment Manager Questionnaires; however, only the Pension Fund has a significant factor loading meaning that there is no “steady stream of bankable infrastructure project”.

Table 14: Factor Score and Descriptive Statistics for “Steady stream of bankable infrastructure projects/opportunities” variable

Bold value denotes significant factors

	Yes	No	F1	F2
Investment Manager	23%	77%	-0,24	
Pension Fund	20%	80%	-0,34	-0,97

According to Investment Manager Responses, all variables, with exception of “lack or ineffective public private partnership” and “lack of financial instrument”, have a positive and significant F1 score meaning that they all contribute to the lack of a project pipeline. Similarly, factor analysis results of Pension Fund responses revealed the following three variables have a positive and significant F1 score which confirms that they also contribute to lack of project pipeline; (i) a lack or ineffective public private partnership policies, (ii) a lack of government support and (iii) a lack of infrastructure development plans, as shown in Table 15. The other variables all have a negative and significant F1 score indicating they do not contribute to the lack of project pipeline. The lack of project pipeline in Namibia supports Ehlers (2014) and Eberhard et al. (2014)’s observations that the associated increase in transaction cost can be prohibitive to infrastructure development.

Table 15: Factor Score and Descriptive Statistics for “Factors attributed to a lack of a project pipeline” variables

Bold value denotes significant factors

	Investment Manager		Pension Fund		
	% Response	F1	% Response	F1	F2
Project not viable on their own	60%	0,69	8%	-0,70	0,28
Lack of financial instruments	40%	0,44	23%	-0,63	0,17
Infrastructure project not sufficiently development	80%	1,01	31%	-0,22	0,04
Implementing agencies Lack of expertise in project development	60%	0,75	15%	-0,67	0,202
Lack or ineffective public procurement policies and processes	100%	1,4	23%	-0,36	-0,39
Lack or ineffective public private partnership policies	40%	0,48	38%	1,03	1,43
Lack of government support	80%	1,08	23%	0,98	1
Lack of infrastructure Development Plan	40%	0,44	54%	1,42	0,67
Unfair risk allocation to private parties in PPP Projects	60%	0,82	8%	-0,7	0,28
Lack of Project Preparation(feasibility Studies) Funding	60%	0,75	15%	-0,66	0,29

The descriptive statistics in Table 16 shows that Investment Manager view existing PPP and Public Procurement policies largely to be effective however this view has been rejected because the F1score for both variables are not significant. Pension fund respondent, however, views public procurement policies to be effective based on descriptive statistics however this variable is also not significant. PPP policies are viewed as effective and efficient by pension fund responses as confirmed with both descriptive statistics, F1 and 2 scores which are positive and significant as depicted in Table 16.

Table 16: Factor Score and Descriptive Statistics for “Effectiveness and Efficiency of Public Policies” Variable

Bold value denotes significant factors

	Investment Manager			Pension Funds			
	Yes	No	F1	Yes	No	F1	F2
Public Procurement Policies	50%	50%	0,29	12%	65%	- 0,42	-0,13
Public Private Partnership Policies	75%	25%	0,01	47%	29%	1,47	0,67

Survey participants provided the following motivation with their response to the lack of project pipeline, effectiveness and efficiency of Public Procurement and PPP policies.

Respondent A: “Often infrastructure projects are very high in value and then government procurement processes can become corrupt and the projects are stopped”

Respondent B: *“The Namibian PPP act is a well-written piece of legislation. The bottlenecks are the government's lack of coordination and a lack of project preparation and financial structuring”*

Respondent C: *“Existing legislation does not have a track record in the procurement of big capital projects etc.”*

Respondent D: *“TOO slow - same as above some regulations work directly against each other”*

Respondent E: *“Legislation, policies and regulation are relatively new and there is no track record in the successful execution of PPP Projects”*

The lack of or ineffective public procurement policies can be attributed to a lack of a project pipeline is accurate to some degree because of the Public Procurement Act no. 15 of 2015 which was promulgated on the 1st April 2017. The Public Procurement Act governs the procurement of goods, works and services by Government ministries, public entities (state-owned entities) and local authorities. Government and public entities are tasked with infrastructure development, however, no significant works procurements exceeding N\$ 100 million were awarded since the act came into effect which confirms the above responses from respondents that Public procurement do not have track record and effectiveness and efficiency still have to be proven.

Major construction works contracts, such as the Nekartal Dam Project and the Strategic National Oil Storage Facility, were procured and awarded by under earlier policies that were run by the Tender Board of Namibia. The value of the two projects was approximately N\$ 6 billion each at the time of completion. The Public Procurement Act is benchmarked against world-class practices and endorsed by institutions such as the World Bank. However, the policy rollout and implementation was not gradual and the centralisation of the major procurement activities at the Central Procurement Board(CPB) for all procurements exceeding a certain threshold, essentially created excessive bureaucracy, bottlenecks and inefficiencies in the procurement of goods, works and services.

Similarly, the Public Private Partnership Act no. 4 of 2017 came into effect in December 2018 therefore, it has no track record. A few public-private partnership transactions were completed before the enactment of the PPP Act however, these were limited to bulk housing infrastructure projects and were transactional because the operation and maintenance of the assets are returned to the public sector after construction. The government is relying on PPP policies and regulations to attract private investment in infrastructure development given the dwindling government budgetary and borrowing capacity. Traditionally, infrastructure projects are financed from the government's budgetary allocation, user fees and borrowings.

As confirmed by research participants, infrastructure projects typically have a high upfront capital investment which can be mired in corruption due to a lack of transparency in procurement processes. This is evident in the cancellation of infrastructure projects, such as the expansion of Hosea Kutako International airport (Office of the President, 2015) and the upgrade of Ondangwa Airport runway (Routh, 2019), due to ballooning costs and irregularities in awarding of the tenders.

4.5.2 Financial Instruments

Pension Fund and Investment Managers acknowledge based on descriptive statistics and factor analysis(F1 score) that financial instrument does match Pension Fund investment strategies with respect to risk and return as depicted in Table 17. This view, however, conflicts with finding in section 4.4 and 4.5.2 where a majority of Pension Fund respondents do not recognise infrastructure as a unique asset class with distinct economic and financial characteristics and the mismatch between investors’ expectations with regard to various facets of financial instruments as later reviewed in section 4.5.2.2 - 4.5.2.5. The characteristics of the unlisted equities on key aspects such as liquidity, the scale of investment, exposure to political and regulatory risks and investment horizon are aligned to Bitsch et al. (2010) ‘s observation in the empirical study on “Risk, Return and Cash flow characteristics of infrastructure fund investments”.

Table 17: Factor Score and Descriptive Statistics for “financial Instrument alignment with Pension Fund or asset manager investment strategy (risk-return)” variable

Bold value denotes significant factors

	Yes	No	F1	F2
Investment Manager	100%	0%	1,40	
Pension Fund	92%	8%	2,41	-1,13

The following section analyses various facets of the preferred instrument in greater detail. It will be revealed, through factor and descriptive analysis, contrary to the above findings, financial instruments largely do not match Pension Fund requirements such as liquidity, risk exposure and scale of capital investment.

4.5.2.1 Lack of financial assets/instruments

The lack of a project pipeline could partly be attributed to a lack of financial instruments matching investors' requirements such as liquidity, the scale of investment, investment horizon and risk exposure. The majority (77%) of Pension Fund respondents indicated that they invest in infrastructure via "unlisted equity" while the Investment Manager has a preference for "direct borrowing". Regulations 28 and 29 have encouraged Pension Funds to invest in infrastructure through licenced Unlisted Investment Managers (UIM). Pension Fund's F1 Score shows that unlisted (private) equity variable which has a positive and significant score meaning that it is the preferred financial instrument for investing in infrastructure. All the other variables (financial instruments) have a negative and significant F1 score meaning that they are not preferred financial instrument. Investment Manager observation shows that a few variables have a negative and significant factor F1 scores meaning that they are not widely used for investing in infrastructure. The two variable, (i) Unlisted (Private) Equity and (ii) Direct Borrowing (OTC)/Debt does not have a significant score. The lack of listed infrastructure shares and funds on the Namibian Stock Exchange could thus be attributed to a lack of Pension Fund investment in infrastructure, especially via listed shares and funds as evident in the responses in Table 18. The above findings confirm observation is a similar survey by Pregon which shows that institutional investors have a preference for unlisted equities (OECD, 2014) in infrastructure investing.

Table 18: Factor Score and Descriptive Statistics for Investment Manager and Pension Fund Preferred financial instrument for infrastructure investment variables

Bold value denotes significant factors

	Investment Manager		Pension Fund		
	% Response	F1	% Response	F1	F2
Listed Funds	0%	-0,56	0%	-0,707	0,32
Listed Equities/Shares	0%	-0,56	0%	-0,707	0,32
Unlisted(Private) Equity	20%	0,16	77%	2,142	-0,893
Unlisted Funds	20%	-0,29	15%	-0,488	0,041
Direct Borrowing(OTC) - Debt	40%	0,14	0%	-0,707	0,32
Bonds	0%	-0,56	8%	-0,665	0,283
Other	20%	-0,30	0%	-0,707	0,32

4.5.2.2 Highly illiquid assets/instruments

Investment Managers and Pension Fund respondents both view unlisted equities as highly illiquid, which may be a deterrent to some investors as confirmed by the significant negative factor F1 Score as indicated in Table 19. This finding confirms existing work by Bitsch et al. (2010) that unlisted equities and direct debt are illiquid. Liquidity is often associated with an investment horizon hence a long term investment is likely to be less liquid.

Table 19: Factor Score and Descriptive Statistics for “Liquidity level of preferred instrument” variable

Bold value denotes significant factors

	Investment Manager			Pension Funds	
	Response %	F1	Response %	F1	F2
Liquidity Levels?		-1,54	0%	-1,94	0,22
Low	100%		69%		
Medium	0%		31%		
High	0%		0%		

The requirements for unlisted investment, as part of Regulations 28 and 29 however, mandate Pension Funds to invest in this asset class irrespective of whether they are liquid or not. Survey respondents provided the following response to justify the highly illiquid nature of unlisted equities, the preferred financial instruments.

Respondent A: “There is no secondary market for these assets so once you have made the investment you are typically locked in until you can recoup your investment through the annuity payment stream”

Respondent B: *“It often takes at least seven years to repay sufficient capital for the equity to have value. It is easier to refinance the debt”*

Respondent C: *“Listed assets Fund are easily tradable”*

Respondent D: *“Namibian bonds are not liquid”*

As confirmed with the above qualitative response, *“It often takes at least seven years to repay sufficient capital for the equity to have value”*. Hence equity investors are likely to be invested in these assets until sufficient return on investment has been made. Respondents also attribute the lack of liquidity to a lack of a secondary market for infrastructure assets; hence, once the investment has been made, the investors are typically locked in until they can recoup their investments through the annuity payment stream. Respondents acknowledge that listed equities are a preferred instrument for investment in infrastructure largely because they are liquid and allow them to divest at any point in time. Furthermore, responses acknowledge that Namibian bonds, especially non-government bonds are highly illiquid which may be a drawback to infrastructure investing. The above qualitative findings are aligned to the descriptive statistics and factors analysis results (F1) in Table 19.

4.5.2.3 The scale of investments is too high

Table 20 shows that, according to respondents, the scale of investment required for preferred financial instruments ranges between medium and high scales. Similarly, F2 score for Pension Fund is positive and significant which implies that the scale of investment required for infrastructure investment may be too high. The scale of the investment required may prove to be a challenge, given the fragmented nature of the Pension Fund industry in Namibia. Investment Manager F1 score does not a significant factor loading partly due to the aggregation of pension fund investment at fund manager level. Most of the samples pension fund respondents represent Pension Fund with larger assets which can explain the divergent F1 and F2 score. A smaller segment of pension fund respondents has the view that the scale of capital investment is low as shown in Table 20.

Table 20: Factor Score and Descriptive Statistics for “Scale of capital investment of preferred instrument” variable

Bold value denotes significant factors

	Investment Manager		Pension Funds		
	Response %	F1	Response %	F1	F2
4. Scale Of Capital Investment?		0,09	0%	-0,81	1,21
Low	0%		31%		
Medium	40%		38%		
High	60%		31%		

Survey respondents provided the following responses to motivate for the high scale of capital investment required for infrastructure assets.

Respondent A: “Our fund is very small so we can't fund large infrastructure projects”

Respondent B: “about 1% of the Fund”

Respondent C: “N\$ 20 to 100 million or more per project and package”

Respondent D: “We manage large pools of money for large institutional investors and therefore we typically have a large ticket to make into infra assets”

Investment Managers have a large number of investors and are more likely to achieve the required scale to invest in large scale infrastructure initiatives as alluded by respondents above. On average most Pension Funds have total assets under management that are less than N\$ 100 million and, in the absence of listed/unlisted funds, small to medium-sized Pension Funds may not be able to gain the required scale to invest in infrastructure. Pension Fund respondents acknowledge that small fund size does not allow investments in large infrastructure projects. Regulations 28 and 29 have given rise to several Unlisted Investment Managers who can pool investments from several Pension Funds to gain the necessary scale to invest in infrastructure assets; however, Pension Funds are also limited to invest a maximum of 3.5% of the assets with unlisted investments. The Namibia pension fund industry shares similar characteristics with the Australian and Canadian Pension fund industry in that they are highly fragmented with a large number of smaller pension funds. The scale of the investment may equally be a barrier to pension fund investment in infrastructure development. Similarly, Investment Managers may pool large funds to allow small Pension Fund capacity to invest in a big capital infrastructure

project. The 3.5% limitation may make it impossible to achieve the scale required to invest in infrastructure assets.

4.5.2.4 Financial Instrument Riskiness

Respondents indicated, as per Table 21 and as confirmed with F2 score that the risk level of the financial instrument used for infrastructure investment ranges between medium and high levels. Survey participants provided the following response about the high-risk exposure and mitigation steps;

Respondent A: *“We typically only invest in infra projects with a proven income stream that makes commercial sense. We also ensure that there are strong guarantees in place as well as covenants, and performance clauses. This removes a lot of the risk in the investment but we will typically still be exposed to political risk and for this, we take out risk cover as well. The main issue with this type of investment is the lack of liquidity, political and regulatory risks involved”*

Respondent B: *“Most infrastructure deals have long term annuity income streams - these are ideal for pension funds”*

Respondent C: *“The assets are generally collateralized”*

Large Pension Funds and Investment Managers can reduce their risk exposure by minimising the scale of investment in any single project, typically less than 1%. Investment Managers typically required strong guarantees, collateral, covenant and performance clauses in Finance Documents/Agreements as a means to reduce investment risks. Political risk mitigation steps may include political risk insurances; however, residual risk may remain high due to low liquidity and exposure to regulatory risk. Financial and technically capable developers who are willing to take on the upfront construction risk may also de-risk the project however these are few and far between.

Table 21: Factor Score and Descriptive Statistics for “Riskiness of Preferred instrument” variable

Bold value denotes significant factors

	Investment Manager		Pension Funds		
	Response %	F1	Response%	F1	F2
3. Riskiness?		- 0,33	0%	-0,07	1,59
Low	20%		23%		
Medium	60%		38%		
High	20%		38%		
5. Exposure To Regulatory And Political Risks		- 0,04	0%	-0,30	2,04
Low	0%		31%		
Medium	60%		38%		
High	40%		31%		

Similarly, the findings in Table 21, show that, given the investment horizon (term) and the level of exposure to political and regulatory risk associated with unlisted equities (preferred financial instruments), the risk level ranges between moderate and high. There is a correlation in risk rating, survey response and F1 and F2 Scores between political and regulatory risks and overall financial instrument riskiness, as shown in Table 21. F2 score has a positive and significant factor loading which confirms a high level of exposure to regulatory and political risks. Regulations 28 and 29 limit investment to 3.5% of assets partly because infrastructure investment is considered to be high risk.

Disproportionate risk allocation between the private and private sector can also result in high investment risks. The principles of allocating risk to the party best placed to manage risk must be strictly adhered to de-risk infrastructure investment and unlock the potential to catalyse development and economic growth. Table 22 below shows that Investment Managers views that private sectors bear the most risk in PPP Projects while Pension Fund respondents believe that the public sector bears the most risk in PPP projects. F1 and F2 scores for both respondents confirm that the public sector assumes more risk than the private sector. The private sector in developed countries naturally assumes demand risk; however, there are still instances where the public sector is best placed to manage demand risk. A gas-fired power station might require minimum gas offtake from the gas producer and the minimum offtake from the power generation company. A toll road PPP operator typically assumes the risk on the traffic volume. The toll road operator may, in this instance, conduct detailed traffic flow studies and modelling to make sure that the project is viable to mitigate demand risks. The Namibia PPP Act advocates

for value for money, performance-based payment and risk transfer to the private counterparty. The PPP Act will inherently result in the transfer of risk to the private sector.

Table 22: Factor Score and Descriptive Statistics for “Risk Allocation between Private and Public Sector in PPP Projects” variable

Bold value denotes significant factors

	Investment Manager		Pension Funds		
	% Responses	F1 Scores	% Responses	F1 Scores	F2 Scores
Risk Allocation		-0,69		-0,093	-0,832
Public	20%		50%		
Private	80%		38%		
Private Risk Insurance	0%		13%		

4.5.2.5 Investment Horizon - Short-termism Investment strategies

Despite differing on the preferred instrument for investment in infrastructure assets, Investment Manager and Pension Fund respondents concur that financial instruments’ investment horizon (term) or maturity ranges from medium to long-term as shown Table 23. This variable has a positive and significant F1 score which confirms the medium to the long term investment horizon. A defined benefit fund may take a long term investment view; however, the same cannot be assumed of defined contribution funds that make up the majority of the Pension Funds in the industry. Most of Pension Funds are relatively small with assets of less than N\$ 100 million thus may prefer to invest in highly liquid assets that have short term maturity.

Table 23: Factor Score and Descriptive Statistics for “Investment horizon of preferred instrument” variable

Bold value denotes significant factors

	Investment Manager		Pension Funds		
	Response %	F1	Response %	F1	F2
Investment Horizon?		- 0,14		0,764	-0,246
Short-Term(1-3 Years)	0%		0%		
Medium Term(4-6 Years)	40%		23%		
Long-Term (>7 Years)	60%		77%		

Survey respondents provided the following motivation to motivate their response on the investment horizon associated with unlisted equities.

Respondent A: “Infrastructure investment has a j-curve and therefore we need to lend over long periods of time in order to make the financial model make sense. There is also a strong alignment in the return profile of infra assets and pension fund liabilities which means it makes more sense to invest over the long-term. There is also no natural market to sell the investment

which means that once you have committed capital to the project/asset you are locked in for the long-term”

Respondent B: “Infrastructure requires unlisted equity and unlisted long term debt - project finance in other words”

Respondent C: “Pension Fund are long term investment”

Infrastructure projects tend to have a net negative cash flow in their initial year of commercial operation hence the J-curve as shown in Figure 12. Project finance is typically used to finance large scale infrastructure projects via a combination of unlisted debt and equity. Project finance debt financing is most often done on a limited or no resource basis which makes it an expensive source of finance for infrastructure developers. Project financing is a long term financing to improve the viability and competitiveness of infrastructure projects. The above qualitative response confirms the descriptive statistics and factor analysis results which shows that “long investment term” is an inherent feature of infrastructure investment. According to previous studies by Bitsch (2012), Bitsch et al. (2010) and Inderst & Della Croce (2013), there is a strong alignment in the return profile of infrastructure asset and Pension Fund liabilities which makes them perfect for investment over the long-term. There is no natural market to sell the investment which means that, once an investor has committed capital to the project/asset, the investor is locked in for the long-term.

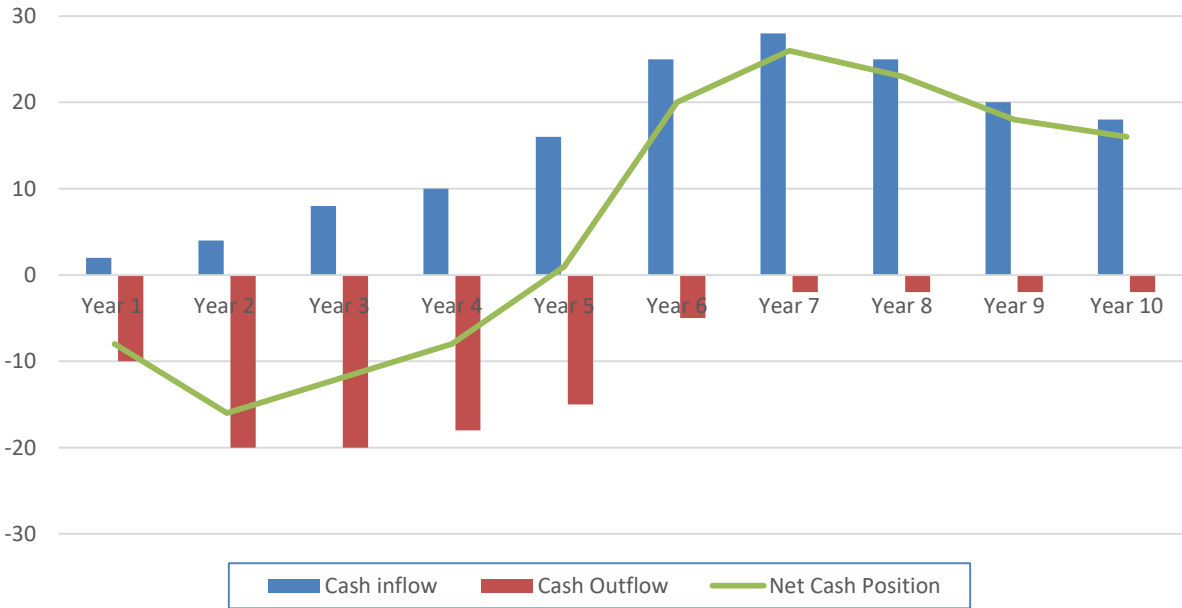


Figure 12: Infrastructure investment J-curve

4.5.3 Investment too risky

The finding in section 4.5.2.4 confirms that investment in infrastructure is generally risky. Table 24 below shows the variables that, according to the respondents, make infrastructure investment too risky. Greenfield projects are especially risky as shown in Figure 8 due to several factors which amongst others includes construction risk (completion) and credit risk. As per factor analysis findings for Investment Manager responses, the following variables have a positive and significant F1 score; (i), high construction and patronage risks, (ii) high regulatory and political risks, and (iii) unfair risk allocation in Public Private Partnerships. Pension Fund respondents attribute riskiness of infrastructure investment to high credit risk and a lack of government support; however, high construction and patronage risks do not contribute to high investment risks. The findings that “infrastructure investment is too risky” is aligned with observations by researchers such as Bitsch et al. (2010), Beeferman(2008); Ehlers(2014); Inderst(2010); Inderst and Della Croce(2013) and Thierie and Moor (2016). The factors attribute for high investment risk are mostly related to greenfield infrastructure development which as per findings by Bitsch et al. (2010) have a relatively high-risk exposure as compared to brownfield projects.

Table 24: Factor Score and Descriptive Statistics for “factors causing high risk in infrastructure investment/assets” variables

Bold value denotes significant factors

	Investment Manager		Pension Fund		
	% Response	F1	% Response	F1	F2
High Construction And Patronage Risk	100%	1,395	46%	0,622	-2,235
Unfair Risks Allocation In Public Private Partnerships	60%	0,821	31%	-0,421	-0,068
Lack Of Government Support Framework	40%	0,437	46%	1,099	1,396
High Regulatory And Political Risk	80%	1,138	31%	1,032	1,505
High Credit Risks	20%	-0,244	38%	1,349	0,263
Technology No Mature And Prove In Local Context	0%	-0,560	0%	-0,707	0,32
All Of The Above	0%	-0,560	15%	-0,707	0,199

4.5.4 Lack of expertise/understanding of infrastructure assets

All Pension Fund respondents acknowledge that they do not have internal resource and investment expertise to manage and originate infrastructure investment deals. As confirmed with F1 score in Table 23, the lack of expertise amongst Pension Funds is mainly due to the

following factors; (i) costly to keep expertise internal and (ii) asset managers can do it better at lower costs. Fifty percent of Investment Manager Respondents do not have internal resources and investment expertise as shown in Table 25. The rate of Investment Managers with internal expertise is higher than for Pension Funds because managers are actively involved in managing Pension Fund assets and the fact that investment services may be sourced from the head office where there are economies of scale. The parent companies for most, if not all Investment Managers in Namibia reside in South Africa where some head office functions are hosted. As a result, Investment Managers in Namibia may not have the required investment expertise available locally as these are provided from the head office.

Table 25: Factor Score and Descriptive Statistics for “Internal resources and investment expertise to manage infrastructure investment” variable

Bold value denotes significant factors

	Yes	No	F1	F2
Investment Manager	50%	50%	0,75	
Pension Fund	0%	100%	-0,71	,32

Positive and significant F1 score confirms the view that the Investment Manager have internal expertise. Pension funds F1 score for variable such as; (i) costly to keep expertise internal and (ii) asset manager can do it better at lower cost are positive and significant meaning they can be attributed for lack of internal resources amongst pension fund respondents as shown in Table 26. The other variables have a negative and significant factor meaning that they do not contribute to the lack of internal resources for investing in infrastructure. The lack of internal expertise increases investment costs and acts a barrier to pension fund investment into infrastructure in support of Inderst & Della Croce (2013) research findings on Australian and Canadian Pension Fund Investment in Infrastructure. Inderst & Della Croce (2013) found that smaller pension funds are not likely to have internal expertise for pension fund investment infrastructure in support of the above findings in Namibia.

Table 26: Factor Score and Descriptive Statistics for “Factor attributed to lack of internal resources” variables

Bold value denotes significant factors

	Response %	Investment Manager		Pension Fund	
		F1	Response %	F1	F2
Costly To Keep Expertise Internal	40%	-2,20	46%	1,34	0,18
Lack Of Scale To Manage Investments Inhouse	20%	-2,39	15%	-0,64	0,21
Asset Managers Can Do It Better At Lower Costs	0%	-2,52	85%	2,39	-1,06
Not Enough Infrastructure Investment To Warrant Internal Expertise	20%	-2,39	15%	-0,55	-0,03

4.5.5 Alignment in Investment Strategies

The majority (53%) of Pension Fund respondents acknowledge that they typically do not offer their members choices in terms of the risk-return profile in which their savings are invested. All members are therefore exposed to the same risk-return profiles as part of one umbrella fund/investment portfolio. The impact of members’ choice on the Pension Fund investment strategies concerning investment horizon, liquidity requirement, risk appetite and the scale of capital requirement is negligible as shown in Table 27. Most of the respondents indicated low or no impact from fund members’ choices on investment strategy aspects as liquidity, risk tolerance and capital requirement. Fund members’ choices thus have a negligible impact on investment strategies. F1 and F2 score for all variables except the target investment horizon has a negative and significant score meaning that these variables do not have an impact on investment strategies. The target investment horizon is naturally long-term due to the long term nature of Pension Fund liabilities so the indication according to F1 scores (positive and significant) that the impact of member choice of target investment horizon is high may not be necessarily true.

Table 27: Factor Score and Descriptive Statistics for “Impact of Member choice on Pension Fund Investment Strategy” variables

Bold value denotes significant factors

	Responses				Factor Scores	
	Short-term (1-3 years)	Medium Term (4-6 years)	Long-term (>7 years)	N/A	F1	F2
Target Investment Horizon	11%	33%	56%	0%	2,001	-0,829
Liquidity	60%	10%	0%	30%	-1,187	-1,982
Risk Appetite/Tolerance	67%	11%	0%	22%	-0,948	-2,301
Scale Of Capital Investment	33%	11%	22%	22%	-0,539	-2,825

4.6 Impact of Pension Fund Regulation on Infrastructure investing

Survey respondents provided the following response about their view on the impact of regulation on pension fund investing in infrastructure.

Respondent A: *“Bureaucracy, too slow, NAMFISA over-regulated”*

Respondent B: *“It is an important consideration. The important thing is that the regulations should be consistent and the regulator should be market-friendly in their approach. By "market-friendly" I mean that they should be open to engagement and be staffed with competent people that will look to maximise the utility from these projects for all parties involved - including the end consumers”*

Respondent C: *“Pension Fund Regulation limited to 3.5 for unlisted investments”*

Respondent D: *“asymmetric return and effort”*

Respondent E: *“Infrastructure investment is highly risky for pension fund and as a result regulation have limited the amount of direct infrastructure investment to 3.5% of Fund which can be very low in terms of dollar value for most of the pension funds”*

Respondent F: *“Incentives are required for infrastructure projects - e.g. the solar power purchase agreements”*

Respondent G: *“Limits how much pension fund can invest in unlisted investment to a maximum of 3.5% of the asset under management”*

Respondent H: *“If regulators want to determine pricing outside the commercial terms, it jeopardises the project viability”*

Respondent I: *“It has a minimum impact as there is no proper regulation on infrastructure investment”*

Respondent J: *“Provide security to the investor through the creation of Special Purpose Vehicle (SPV)”*

Respondent K: *“Compromising liquidity and increase portfolio risk over the short term”*

Respondent L: *“Regulatory restriction on limits”*

According to the above narrative, the impact of regulation is most visible in terms of the limitations that Regulations 28 and 29 put on Pension Fund investment with Unlisted Investment Managers (UIM). Pension Funds are required to invest a minimum of 1.75% and a maximum of 3.5% in unlisted investment via unlisted Investment Managers under Regulation 28. Infrastructure investment could be very risky for Pension Funds and, as a result, regulations place limits on the amount of direct infrastructure investment to 3.5% of the fund which can be very low in terms of dollar value for most of the Pension Funds. Most Pension Funds are valued at less than N\$ 100 million and may not be able to achieve the required scale to be able to invest in infrastructure in the absence of financial instruments that allow flexible investment scales, especially given the findings in section 4.6, which state that, according to the respondents, the required investment scale ranges from moderate to high.

Furthermore, respondent express concerns with excessive regulation and a slow and incompetent regulator, which may be negatively impacting Pension Fund investment in infrastructure. The regulations may be stringent, however, they do assure investors through the creation of a Special Purpose Vehicle (SPV) that investments are being invested and managed prudently. Pension Funds are involved in investment decisions as part of the SPVs (private limited company or trusts) that are set up solely to approve and monitor the performance of Pension Fund investment/assets.

CHAPTER 5: Conclusions and recommendations

5.1 Introduction

This chapter covers the conclusions of the research findings and analysis within the context of the literature review and with the aims of answering the research questions and achieving the research objective. The chapter consists of four main sections, namely, (i) the review of factors hindering Pension Fund investment in infrastructure; (ii) the section covering Pension Fund attitudes towards investment in infrastructure; (iii) Pension Fund regulation; and lastly (iv) recommendations for future research. The chapter is structured in such a manner as to provide answers to the research question and fulfil the research objective.

5.2 Factors hindering Pension Fund Investment in Infrastructure

The research largely confirmed the finding by (Beeferman, 2008; Della Croce & Yermo, 2013; Inderst & Della Croce, 2013), amongst other researchers, who identified the following key factors as presenting a challenge to fund investment in infrastructure:

- a) **The lack of project pipeline** is by far the main factor hindering mainly Pension Fund investment in infrastructure in conformance with earlier findings by researchers such as Beeferman (2008), Eberhard et al., (2014) and Inderst & Della Croce (2013). The lack of a project pipeline is caused by a combination of factors, each with a varying level of influence. The top factors are, (i), projects are not sufficiently developed therefore they are not readily bankable. (ii), public procurement policies and procedures are not fully mature and have not been tested for large scale infrastructure projects. Inefficiency in public procurement processes and procedures prevent or delay private sector investment in economic and social infrastructure assets. Policymakers are recommended to create the necessary conditions for Public Procurement and Public Private Partnership policies to gain sufficient track records and create confidence amongst investors. Rooting out corruption and ensuring processes are transparent and fair to all stakeholders can create investor confidence in the two policies. (iii), there is no government support mechanism for large scale infrastructure projects. As demonstrated with the upgrade of the Walvis Bay container terminal, government guarantees for state-owned entity debt repayment obligations have proven crucial in successfully raising financing for projects from the African Development

Bank (AfDB) (AfDB, 2013). The Kudu Gas to Power Project, which forms part of the national development plans and was meant to ensure the security of supply in Namibia and turn the country into a net exporter, is largely stagnating due to the fact the government is not in a position to offer monetary and non-monetary guarantees. There are no government guarantees envisaged in the PPP framework which would give comfort to private investors that infrastructure being developed is needed and enjoys the support of Government. Private sector investors are reluctant to invest in large scale public infrastructure projects due to lack of government support mechanisms.

Other factors may include issues such as; (iv) a lack of funding for project preparation and feasibility studies, (v) projects that are not viable on their own without government subsidies, (vi) unfair risk allocation to the private sector for risks that should naturally be assumed by the government, (vii) the implementing agency may lack expertise in project preparation and feasibility studies; (viii) and the absence of funding may result in delays in the execution of projects. Most institutions tasked with infrastructure development rely on own funding sources for project preparation and feasibility studies, which may be limited or not available at all. International development financial institutions are slowly availing grant funding for use in project preparation or feasibility studies and to continue supporting public institutions. The National Planning Commission,(2017a) has, as part of the NDP5, identified detailed projects, especially in the energy, water, railway, port and road infrastructure sectors for development; however, these need to be sufficiently developed to be bankable. Investors need certainty in terms of the investable opportunities as demonstrated with the South Africa REIPPP programme where a large number of IPPs was procured over numerous rounds of procurement. Local financial institutions, such as the Development Bank of Namibia, need to investigate the provision of project preparation and feasibility study funding to increase the pipeline project.

Inderst & Della Croce (2013), in their study on Pension Fund investment in Australia and Canada, revealed that integrated, coordinated infrastructure planning across different levels of implementing agencies is a necessity to increase the supply of infrastructure projects. Implementing agencies are recommended to develop long term infrastructure development plans and allocate funding resources to ensure the projects are sufficiently developed and bankable. The national development plans (NDPs) already provide detailed plans for the development of social and economic infrastructure; however, these need to be coordinated

at various levels of government, central government (line ministries), regional and local government, and state-owned enterprises tasked with implementing these plans. The projects may be developed with in-house resources or external expertise that has a track record in the development of similar projects.

The government needs to develop an implementation agreement or a government support framework that does not place a burden on the fiscal budget and create a debt burden on the government. The implementation agreement creates the same obligation as a standard on-demand and unconditional guarantee but without the burden created by the contingent liabilities and reduced government borrowing capacity. As per the finding by Ehlers, (2014), the lack of an infrastructure project pipeline increases the cost of bidding and investors and developers incur high costs during the bidding process with no guaranteed chances of success and no guarantees of other projects in the pipeline.

- b) **Pension Funds lack expertise in infrastructure investment and do not recognise infrastructure as a unique asset class.** Pension Fund administrators require the necessary skills and expertise to manage infrastructure investments in-house as a combination of the lack economies of scale and the fact that fund managers can manage infrastructure investments more economically, can create more value for Pension Funds and their beneficiaries. Internal fund managers may also outsource these functions to group level or regional office level. The lack of expertise may also be attributed to the fact that Pension Fund administrators mostly rely on external consultants/experts to manage and exercise oversight over Investment Managers on their behalf. Pension Funds only focus on higher-level asset allocation per asset class and performance as part of their investment management activities. Inderst & Della Croce (2013) argue that in-house resources are a key success factor for infrastructure investing. Pension Funds can, over time, gain experience that would enable direct investment in infrastructure projects or allow them to originate projects.
- c) **Available financial instruments (unlisted equity)** are highly illiquid and require a long term approach which may not match Pension Fund requirements. Mature financial markets, such as Canada, Australia and, to some degree, South Africa, offer a full spectrum of instruments that match the needs of the Pension Fund as indicated in Figure 8. Available financial instruments do not necessarily match the needs of Pension Fund investors across

the risk-return spectrum. Financial instruments should cater to the needs of the broad spectrum of Pension Funds with relatively low assets, defined benefits or defined contributions, short or long investment horizons, varying degrees of risk appetite and liquidity requirements. The pool of listed infrastructure assets is limited to a few bonds from infrastructure asset operators/developers that are listed on NSX/JSE and the few listed equities focusing on ICT and renewable energy. Investment in infrastructure via unlisted equity is considered highly risky due to the long term and illiquid nature of the investment. Listed infrastructure equity/shares and funds are very limited and will not absorb available funding. The lack of depth and financial instruments forces Pension Funds to largely invest in government bonds to meet the local asset requirements as per the requirement of Regulation 28. Infrastructure developers, financial institutions and regulators need to create instruments, such as listed equities or funds that meet Pension Fund requirements concerning risk-return, scale and term of investment, and liquidity of the assets. Listed funds may be highly liquid and have a lower capital requirement relative to unlisted equities. The available listed bonds cannot absorb available funding even if fully drawn down due to their limited scale. The financial regulators, NAMFISA and the Bank of Namibia should encourage the growth of the local financial sector to increase the number of financial instruments available to investors and increase the size of the financial sector to absorb local funding capacity. The government is recommended to explore the options of partial listed infrastructure SOEs, such as NamPower, NamWater, Road Fund Administrator (RFA), NamPort and TransNamib, among others, to facilitate Pension Fund investment into infrastructure and reduce transaction costs and risks.

5.3 Pension Funds attitudes towards investment in infrastructure in Namibia

The attitude of Pension Funds towards investments in infrastructure is largely driven by a lack of expertise and, to a large extent, the understanding and acceptance of infrastructure as an asset class. The fact that there are very few opportunities to invest in infrastructure assets and limited autonomy of Pension Fund trustees and administrators in managing investments, also perpetuate the attitudes of Pension Funds towards infrastructure assets. The prevailing attitudes can only be reversed with increased Pension Fund investment in infrastructure fostered by a combination of an increased project pipeline, financial instruments that match Pension Fund needs and increased Pension Fund involvement in management and monitoring of Pension Fund investments.

The study confirmed the existing hypothesis that Pension Fund investments in local infrastructure are relatively low, on average between 2 and 5% of their assets, as compared to international Pension Funds which typically invest between 10 and 15% of assets in infrastructure. The factors discussed in section 5.2 can be attributed to the low levels of Pension Fund investment in infrastructure development. Local infrastructure projects may also be competing for investments with international assets which can match investors' high return expectations and low-risk tolerance.

Pension Funds typically invest in infrastructure assets via unlisted Investment Managers in the form of equity or debt. UIM's are required to create a Special Purpose Vehicle on behalf of participating investors (Pension Funds) to allow involvement in the governance and investment decision-making process. The SPV can be in the form of a "trust" registered with the Masters of High Court or a private limited company registered with Business and Intellectual Property Authority (BIPA) of Namibia. The SPV allows for more than one participating investor thus is a form of collective investment scheme and can partly address the issue of the lack of scale for investment in infrastructure, as discussed in section 4.5.2.3. However, the drawbacks of unlisted investment, such as being highly illiquid, having high exposure to political and regulatory risks and the long investment horizon (term), remains.

5.4 Pension Fund Regulation

Pension Fund Regulation encourages Pension Fund investment in infrastructure via unlisted Investment Managers; however, it also restricts the level of investment to a maximum of 3.5% of Pension Fund assets. Pension Funds with assets less than N\$ 100 million may not have the scale to invest in infrastructure assets individually because infrastructure is capital intensive. The limits on assets held with UIMs can be relaxed somewhat to facilitate increased investment in infrastructure while mitigating risk via governance processes. According to Regulation 29, Pension Funds are involved in investment decisions as part of the Special Purpose Vehicles (private limited company or trust) that are set up solely to approve and monitor the performance of Pension Fund investments/assets. The Minister of Finance, as part of the 2020 mid-term budget review, has signalled that the upper limit for unlisted investments will be increased from 3.5% to 5%, 7.5% and ultimately to 10%, subject to meeting performance criteria (Ministry of

Finance, 2019b, 2019a). The increase in upper limits for unlisted investments may address concerns regarding the lack of scale and the negative impacts associated with regulation.

5.5 Recommendations for Future Research

This descriptive and exploratory research revealed the factors hindering Pension Fund investment in infrastructure; however, it did not necessarily prove causality. The research confirmed findings reached in previous studies which are discussed in section 5.3, 5.2, and 5.4. It is recommended to focus future research on investigating the lack of a project pipeline in greater detail to further contribute and deepen the body of knowledge on infrastructure in the Namibian context. Increased Pension Fund (or other institutional investors) investments into infrastructure projects could bridge the infrastructure and funding gaps and stimulate the economic growth, competitiveness and socio-economic development of Namibia in the process.

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Appendix A1: Questionnaire Pension Fund Investment in Infrastructure (Pension Funds)

* Required

1. Does the fund fully recognise infrastructure as a unique asset class with distinct economic and financial characteristics? *

Mark only one oval.

Not Sure Yes Not sure

2. If Answer to 1 is "Yes", Select financial and economic characteristics that make Infrastructure investment attractive *

Check all that apply.

Attractive returns

Stable (Low sensitivity to economic cycles) returns

Low Correlation with other asset classes (diversification potential)

Long term stable and predictable returns

Good inflation hedged returns

Low default Rate

High barrier to entry

None of the above

Other: _____

3. If Answer to 1 is "No", Select feature that makes infrastructure unattractive *

Check all that apply.

Low liquidity

investment too risky

Long investment horizon

Lack of financial instruments

High capital requirement

Other: _____

4.

4. What makes infrastructure investment (assets) too risky?

Check all that apply.

- High construction and patronage risk
- Unfair risks allocation in Public Private Partnerships
- Lack of government support framework
- High regulatory and political risk
- High credit risks
- Technology no mature and prove in the local context
- Other: _____

5. The Pension Fund has a target allocation to infrastructure assets *

Mark only one oval

- Yes No

6. What is the allocation in Percentage?

7. The fund/asset manager have internal resources and investment expertise to Manage infrastructure investment? *

Mark only one oval.

- Yes No

8. If the answer to 7 is No, selected motivation *

Check all that apply.

- Costly to keep expertise internal
- Lack of scale to manage investments in-house
- Asset managers can do it better at lower costs
- Not enough infrastructure investment to warrant internal expertise
- Other: _____

9. Does fund member have a choice in terms of the risk-return profile of their portfolios? *

Mark only one oval.

Yes No

10. What is impact of greater member choice on Investment Horizon *

Mark only one oval.

Short-term (1-3 years) Medium Term (4-6 years) Long-term (>7 years)

Motivate your answer_____

11. What is impact of greater member choice on Liquidity *

Mark only one oval.

Low Medium High

Motivate your answer_____

12. What is impact of greater member choice on Risk Appetite/tolerance *

Mark only one oval.

Low Medium High

Motivate your answer_____

13. What is the impact of greater member choice on Investment capital requirement *

Mark only one oval.

Low Medium High

Motivate your answer_____

14. Select the instruments used for investments in infrastructure assets *

Mark only one oval.

Listed Funds Listed equities/shares Unlisted (private) equity

Unlisted Funds Direct Borrowing (OTC) – debt Bonds

Other_____

15. Does the financial Instrument match the pension fund risk-return expectations?

Mark only one oval.

Yes No

16. In relation to Answer in 14), what is the Investment Horizon? *

Mark only one oval.

Short-term (1-3 years) Medium Term (4-6 years) Long-term (>7 years)

Motivate your answer (optional) _____

17. In relation to Answer in 14), what is the instrument's Liquidity levels? *

Mark only one oval.

Low Medium High

Motivate your answer (optional) _____

18. In relation to Answer in 14), what is the Riskiness of the assets? *

Mark only one oval.

Low Medium High

Motivate your answer (optional) _____

19. In relation to Answer in 14), what is the scale of capital investment? *

Mark only one oval.

Low Medium High

Motivate your answer (optional) _____

20. In relation to Answer in 14), what is the level of exposure to Regulatory and Political risks? *

Mark only one oval.

Low Medium High

21. Is there a steady stream of bankable infrastructure projects/opportunities *

Mark only one oval.

Yes No

22. If the answer to 21 is "No" *

Check all that apply.

Projects are not viable on their own

Lack of financial instruments

Infrastructure project not sufficiently development

Lack of expertise in project development

Lack of or ineffective public procurement policies and processes

Lack of or ineffective public private partnership policies

Lack of government support

Lack of infrastructure Development Plan

Unfair risk allocation to private parties in PPP Projects

Other: _____

Motivate your answer (optional) _____

23. What is the impact of regulation on infrastructure investing? *

24. Are there any effective and efficient public procurement policies for infrastructure development *

Mark only one oval.

Yes No

Motivate your answer _____

25. Are there effective and efficient Public Private Partnership policies for

Infrastructure development *

Mark only one oval.

Yes No

Motivate your answer _____

26. What is the risk allocation for public private partnership projects? I.e. Demand Risk/foreign exchange risk *

Mark only one oval.

Public

Private

Private Risk Insurance

Motivate your answer _____

27. What other factors contribute to low level of investment into infrastructure by Pension Funds *

Appendix A2: Questionnaire Pension Fund Investment in Infrastructure (Pension Funds)

Pension Fund Investment in Infrastructure

Name of Investment/Asset Manager (Optional)

Asset (N\$) under management

1. The fund fully recognise infrastructure as a unique asset class with distinct economic and financial characteristics?

Mark only one oval.

Yes No Not Sure

2. If Answer to 1 is "Yes", Select financial and economic characteristics that make infrastructure investment attractive

Check all that apply.

Attractive returns

Stable (Low sensitivity to economic cycles) returns

Low Correlation with other asset classes (diversification potential)

Long term stable and predictable returns

Good inflation hedged returns

Low default Rate

High barrier to entry

None of the above

Other: _____

3. If Answer to 1 is "No", Select feature that makes infrastructure unattractive

Check all that apply.

Low liquidity

investment too risky

Long investment horizon

Lack of financial instruments

High capital requirement

Not applicable

Other:

4. What makes infrastructure investment (assets) too risky?

Check all that apply.

High construction and patronage risk

Unfair risks allocation in Public Private Partnerships

Lack of government support framework

High regulatory and political risk

High credit risks

Technology no mature and prove in the local context

All of the above

Other: _____

5. The Asset Manager has a target allocation to infrastructure assets

Mark only one oval.

Yes No

6. What is the allocation in Percentage?

7. The fund/asset manager have internal resources and investment expertise to manage infrastructure investment?

Mark only one oval.

Yes No

8. If the answer to 7 is No, selected motivation

Check all that apply.

Costly to keep expertise internal

Lack of scale to manage investments in-house

Asset managers can do it better at lower costs

Not enough infrastructure investment to warrant internal expertise

Other:

9. Select the instruments used for investments in infrastructure assets

Mark only one oval.

- Listed Funds
- Listed equities/shares
- Unlisted (private) equity
- Unlisted Funds
- Direct Borrowing (OTC) - debt
- Bonds
- Other: _____

10. Does the financial Instrument align with Pension Fund or asset manager investment strategy (risk-return?)

Mark only one oval.

- Yes No

11. In relation to Answer in 9), what is the instrument's Investment Horizon?

Mark only one oval.

- Short-term (1-3 years) Medium Term (4-6 years) Long-term (>7 years)

Motivate your answer

12. In relation to Answer in 9), what is the instrument's Liquidity levels?

Mark only one oval.

- Low Medium High

Motivate your answer _____

13. In relation to Answer in 9), what is the instrument's Riskiness?

Mark only one oval.

Low Medium High

Motivate your answer (optional)

14. In relation to Answer in 9), what is the instrument's scale of capital investment?

Mark only one oval.

Low Medium High

Motivate your answer

15. In relation to Answer in 14, and 16, what is the level of exposure to Regulatory and political risks

Mark only one oval.

Low Medium High

16. Is there a steady stream of bankable infrastructure projects/opportunities?

Mark only one oval.

Yes No

17. If the answer to 21 is "No"

Check all that apply.

Project not viable on their own

Lack of financial instruments

Infrastructure project not sufficiently development

Implementing agencies Lack of expertise in project development

Lack of or ineffective public procurement policies and processes

Lack of or ineffective public private partnership policies

Lack of government support

Lack of infrastructure Development Plan

Unfair risk allocation to private parties in PPP Projects

Lack of Project Preparation (feasibility Studies) Funding

Other: _____

Motivate your answer (optional)

18. What is the impact of regulation on infrastructure investing?

19. Are there any effective and efficient public procurement policies for infrastructure development?

Mark only one oval.

Yes No

Motivate your answer

20. Are there effective and efficient Public Private Partnership policies for infrastructure development?

Mark only one oval.

Yes No

Motivate your answer

21 Is there a fair risk allocation between Public and Private Sector in Public Private Partnership projects? i.e. Demand risk

Mark only one oval.

Public/ SOE Sector

Private Sector

Private Risk Insurance

Other: _____

Motivate your answer

22. What other factors contribute to a low level of investment into infrastructure by pension funds

23. I acknowledge that I am participating in this study of my own free will. I understand that I may refuse to participate or stop participating at any time without penalty. If I wish, I will be given a copy of this consent form.

Mark only one oval.

Yes No

Appendix B: Registered Investment Managers

Table 28: NAMFISA Registered Investment Companies

Source: (Government Institution Pension Fund, 2019; NAMFISA, 2019a)

Number	Name of Institutions	GIPF Assets(2018FY) N\$
1	Allan Gray Namibia (Pty) Ltd	6 479 487 000,00
2	Arysteq Asset Management (Pty) Ltd	
3	Ashburton Fund Managers Namibia (Pty) Ltd	
4	Bank Windhoek Ltd	
5	Capricorn Asset Management (Pty) Ltd	
6	Catalyst Investment Managers (Pty) Ltd	817 683 000,00
7	EAU Rouge Investment Managers (Pty) Ltd	
8	MH Prescient Investment Management (Pty) Ltd	
9	FFO Securities Namibia (Pty) Ltd	
10	Financial Investments Services Namibia (Pty) Ltd	
11	First Capital Treasury Solutions (Pty) Ltd	1 227 945 000,00
12	Investec Asset Management Namibia (Pty) Ltd	13 338 006 000,00
13	Investment Solutions (Namibia) Ltd	
14	JM Busha Capital Namibia (Pty) Ltd	
15	Momentum Asset Management (Namibia) (Pty) Ltd	
16	Namibia Asset Management Ltd	14 023 688 000,00
17	Old Mutual Investment Group (Namibia) (Pty) Ltd	8 682 628 000,00
18	PointBreak Equity (Pty) Ltd	
19	Prudential Portfolio Managers Namibia (Pty) Ltd	1 451 173 000,00
20	Sanlam Investment Management (Namibia) (Pty) Ltd	4 998 827 000,00
21	Sovereign Asset Management (Pty) Ltd	2 850 175 000,00
22	Stanlib Namibia (Pty) Ltd	
23	Stimulus Private Equity (Pty) Ltd	
24	Tulive Capital (Pty) Ltd	
25	ZAQ Asset Management (Pty) Ltd	

Appendix C: Registered Unlisted Investment Managers (UIMs)

Table 29: NAMFISA REGISTERED Unlisted Investment Managers (UIM)

Source : (NAMFISA, 2019b)

Registration number	Unlisted Investment Manager	Special Purpose Vehicle	Mandates
4/UIM/01	IJG Capital (Pty) Ltd	IJG Frontier Investment Fund Ltd	Private Equity and Venture Capital
14/UIM/02	Stimulus Private Equity (Pty) Limited	Stimulus Investment Limited	
15/UIM/03	TEMO Capital (Pty) Ltd		
15/UIM/04	BFS NamPro Fund Manager (Pty) Ltd	The Namibia Procurement Fund I and II	Procurement Debt Fund
15/UIM/05	EOS Capital (Pty) Ltd	Allegrow Fund (Pty) Ltd	Private Equity
15/UIM/06	CREO Assets (Pty) Ltd	CREO Investment Fund	
15/UIM/07	Mergence Investment Managers (Namibia) (Pty) Ltd	Mergence Namibia Infrastructure Fund	Infrastructure and Private Equity
15/UIM/08	Zillion Asset Management (Pty) Ltd	Zillion Investment Fund	
15/UIM/09	Hangala Private Equity (Pty) Ltd	Hangala Capital Fund (Pty) Ltd	
15/UIM/10	Capricorn Asset Management (Pty) Ltd		
5/UIM/11	Koningstein Capital (Pty) Ltd	Koningstein Capital Property Investment Fund	Property Development and Private Equity
15/UIM/12	Musa Capital Namibia (Pty) Ltd	The Namibia Mid-Cap Fund	Private Equity
15/UIM/13	Ino Harrith Capital (Pty) Ltd	Namibia Infrastructure Fund	Infrastructure and Private Equity
15/UIM/14	InterCapital Asset Management (Pty) Ltd		
15/UIM/15	Tulive Private Equity (Pty) Ltd		
15/UIM/16	Old Mutual Alternative Investments (Namibia) (Pty) Ltd	Tunga real Estate Fund and Expanded Infrastructure Fund	Property(Retail, Residential and affordable Housing) and Infrastructure services
15/UIM/17	Baobab Capital (Pty) Ltd	Baobab Growth Fund (Pty) Ltd	Venture Capital
15/UIM/18	Makalani Fund Manager Namibia (Pty) Ltd		
16/UIM/19	Ariya Bridge Capital (Pty) Ltd	Ariya Bridge Trust Fund	Infrastructure and Private Equity
16/UIM/20	First Capital Asset Management (Pty) Ltd		
17/UIM/21	Capital Growth Asset Management (Pty) Ltd		
17/UIM/22	Africanrock Capital (Pty) Ltd		
19/UIM/23	Sigma Capital (Pty) Ltd		

Appendix D: Registered Pension Fund and Friendly Societies

Table 30: NAMFISA Registered pension funds and Friendly Societies

Registration Number	Number	Pension Fund	Number of Members	Assets
25/7/7/67	1	Government Institutions Pension Fund (GIPF)	143300	108 236 247 499,00
25/7/7/107	2	Retirement For Local Authorities and Utility Services in Namibia	6442	4 505 724 380,00
25/7/7/489	3	Benchmark Retirement Fund	11336	2 910 021 805,00
25/7/7/6	4	Unipoly Retirement Fund	2592	2 380 056 000,00
25/7/7/41	5	Rössing Pension Fund	676	2 164 617 964,80
25/7/7/301	6	Napotel Pension Fund	1801	1 856 669 134,85
25/7/7/110	7	Namdeb Employees Provident Fund	2228	1 849 014 785,84
25/7/7/35	8	Orion Namibia Provident Fund	12691	1 559 711 682,00
25/7/7/50	9	Nampower Provident Fund	1045	1 312 774 000,00
25/7/7/360	10	Alexander Forbes Namibia Provident Preservation Fund	12986	1 266 380 000,00
25/7/7/337	11	First National Bank Namibia Holdings Retirement Fund	2286	1 179 758 000,00
25/7/7/3	12	Ohlthaver and List Retirement Fund	4839	1 176 446 514,72
25/7/7/206	13	Alexander Forbes Namibia Pension Preservation Fund	8478	1 081 688 000,00
25/7/7/226	14	Standard Bank Namibia Retirement Fund	1899	1 019 593 606,00
25/7/7/38	15	Capricorn Group Retirement Fund	1770	872 439 330,73
25/7/7/116	16	TransNamib Retirement Fund	1405	730 616 478,10
25/7/7/89	17	Namwater Pension Fund	636	590 863 441,00
25/7/7/238	18	Namport Retirement Fund	946	504 280 867,25
25/7/7/106	19	Air Namibia Retirement Fund	710	458 106 033,96
25/7/7/303	20	Bidvest Provident Fund(Previously known as Manica Group Namibia Retirement fund)	2115	425 801 954,00
25/7/7/283	21	Protektor Pension Fund	1936	417 025 679,00

25/7/7/18	22	NBC Retirement Fund	462	410 248 139,05
25/7/7/569	23	FundsAtWork Umbrella Provident Fund (Namibia)	9365	389 545 709,02
25/7/7/539	24	Sanlam Staff Umbrella Fund Namibia	609	337 551 384,00
25/7/7/28	25	Pupkewitz Group Pension Fund	1657	332 096 506,00
25/7/7/22	26	Nedbank Namibia Pension Fund	762	329 619 945,00
25/7/7/583	27	MMI Holdings Namibia Staff Pension Funds	831	326 704 686,19
25/7/7/550	28	Roads Authority Employee Retirement Fund	597	315 504 038,57
25/7/7/429	29	Walvis Bay Retirement Fund	504	299 532 822,37
25/7/7/86	30	Bank of Namibia Provident Fund	327	247 623 134,26
25/7/7/325	31	Skorpion Zinc Provident Fund	712	193 559 253,00
25/7/7/39	32	Cymot Group Pension Fund	416	182 873 160,00
25/7/7/516	33	GIPF Employees Pension Fund	244	176 847 713,09
25/7/7/568	34	FundsAtWork Umbrella Pension Fund (Namibia)	3785	170 463 539,84
25/7/7/494	35	Member of Parliament and Other Office-Bearers' Pension Fund	579	166 947 785,57
25/7/7/284	36	Protektor Provident Fund	351	139 928 454,00
25/7/7/91	37	Metje and Ziegler Pension Fund	447	136 090 936,90
25/7/7/547	38	NAMFISA Provident Fund	168	129 257 418,00
25/7/7/483	39	Namibian Independent Schools' Retirement Fund	185	108 430 200,75
25/7/7/406	40	Agribank Pension Fund	676	2 164 617 965
25/7/7/57	41	NHE (Nasboukor) Retirement Fund	132	71 472 071,00
25/7/7/316	42	A & A Vleis Namibia Voorsorgfonds		
25/7/7/254	43	Afrox IGL Pension Fund		
25/7/7/72	44	AGA Technical Service Provident Fund		
25/7/7/4	45	Agra Retirement Fund		
25/7/7/424	46	Alexander Forbes Group Namibia Pension Fund		
25/7/7/196	47	Alexander Forbes Namibia Retirement Annuity Fund		
25/7/7/576	48	Alexander Forbes Namibia Retirement Fund		
25/7/7/203	49	Alexander Forbes Namibia Retirement Fund (Pension Section)		
25/7/7/202	50	Alexander Forbes Namibia Retirement Fund (Provident Section)		
25/7/7/100	51	Alfa Retirement Fund		

25/7/7/579	52	Alpha Retirement Fund		
25/7/7/351	53	Alphine caterers Retirement Fund		
25/7/7/287	54	Barloworld (Sonnex) Retirement Fund		
25/7/7/177	55	Canyon Hotel Pension Fund		
25/7/7/415	56	CIS Retirement Fund		
25/7/7/7	57	Coca cola Namibia Bottling Company Retirement Fund(Previously known as Namibia Beverage Retirement Fund)		
25/7/7/199	58	DBC Retirement Fund		
25/7/7/220	59	Distell Retirement Fund		
25/7/7/48	60	Dutch Reformed Church in Namibia Retirement Fund		
25/7/7/131	61	EC Jensen Transport Pension Fund		
25/7/7/319	62	Edcon Namibia Retirement Fund		
25/7/7/420	63	ELCRN Pension Fund		
25/7/7/321	64	Friedels Pension Fund		
25/7/7/101	65	Gabus Pension Fund		
25/7/7/339	66	Gendev Namibia Retirement Fund		
25/7/7/428	67	Gendor Group Pension Fund		
25/7/7/32	68	Global Group Pension Fund		
25/7/7/417	69	Hospiplan Namibia Pension Fund		
25/7/7/5	70	Hotel Safari Retirement Fund		
25/7/7/383	71	Intracom Pension Fund		
25/7/7/133	72	Karibib Mining and Construction Pension Fund		
25/7/7/78	73	KFC Pension Fund		
25/7/7/413	74	Lalandii Retirement Fund		
25/7/7/294	75	Legacy Namibia Retirement Fund (Previously known as Stocks & Stocks Namibia Retirement Fund)		
25/7/7/142	76	Lever Brother Namibia Pension Fund		
25/7/7/277	77	Louis Anderson (Namibia) Pension Fund		
25/7/7/452	78	Marina Totoya Ret Fund		
25/7/7/115	79	Meatco Retirement Fund		

25/7/7/272	80	Metal Box (Namibia) Pension Fund		
25/7/7/114	81	Metropolitan Life Retirement Annuity Fund	25361	
25/7/7/334	82	MKU Retirement Fund		
25/7/7/481	83	Momentum Namibia Retirement Annuity Fund (previously Swabou Life RA Fund)		
25/7/7/390	84	MTC Pension Fund		
25/7/7/465	85	Mutual & Federal (Namibia) Retirement Fund		
25/7/7/275	86	Namfish Pension Fund		
25/7/7/227	87	Namib Mills Retirement Fund		
25/7/7/571	88	Namibia Airports Company Provident Fund		
25/7/7/178	89	Namibia Blue Solidate Pension Fund		
25/7/7/40	90	Namibia Building Workers' Pension Fund		
25/7/7/55	91	Namibia Grape Company Retirement fund		
25/7/7/255	92	Namibia Retail (Shoprite) Retirement Fund		
25/7/7/466	93	NamQae Pension Fund-Participating in Namflex Pension Fund		
25/7/7/555	94	NDC Retirement Fund		
25/7/7/161	95	NDC Retirement Fund		
25/7/7/147	96	Novanam Group Retirement Fund - 2002		
25/7/7/341	97	Old Mutual Namib Retirement Annuity Fund (NARAF)		
25/7/7/592	98	Omapungulo Retirement Fund		
25/7/7/63	99	Ondunda Pension Fund		
25/7/7/83	100	Ondunda Provident Fund		
25/7/7/484	101	Oranjemund Spar Pension Fund		
25/7/7/36	102	Orion Namibia Pension Fund		
25/7/7/278	103	PDK Pension Fund		
25/7/7/113	104	PG Glass Namibia Retirement Fund		
25/7/7/407	105	PriceWaterhouseCoopers Retirement Fund		
25/7/7/347	106	PRO Con Pension Fund		
25/7/7/45	107	Profurn Namibia Retirement Fund		
25/7/7/318	108	PW Pampe Retirement Fund		
25/7/7/62	109	Rural Development Centre Provident Fund		

25/7/7/410	110	Sanlam Marketers Retirement Fund in Namibia		
25/7/7/361	111	Sanlam Namibia Retirement Annuity Fund		
25/7/7/492	112	Sanlam Namibian Personal Portfolios Preservation Pension Fund		
25/7/7/491	113	Sanlam Namibian Personal Portfolios Preservation Prov Fund		
25/7/7/490	114	Sanlam Namibian Personal Portfolios Retirement Annuity Fund		
25/7/7/105	115	Seaflower Namibia Retirement Fund		
25/7/7/421	116	Sendingsusters v/d Heiligste Hart v/d Jesus Pension Fund (Missionary Sisters)		
25/7/7/188	117	Sentra 307 Pension Fund		
25/7/7/204	118	Sentra Namibia Pension Fund		
25/7/7/109	119	Solitaire Press Pension Fund		
25/7/7/173	120	South West Bakeries Retirement Fund		
25/7/7/09	121	Susanne-Grau-Heim Pension Fund		
25/7/7/29	122	Swarite Pension Fund		
25/7/7/211	123	TM Pension Fund		
25/7/7/54	124	Trip Travel Fund		
25/7/7/416	125	Typo Retirement Fund		
25/7/7/336	126	United Fishing Enterprises Retirement Fund		
25/7/7/10	127	Vivo Energy Namibia Retirement Fund		
25/7/7/565	128	Walvis Bay Granite Retirement Fund		
25/7/7/357	129	WBV Pension Fund		
25/7/7/74	130	Wecke & Voigts Retirement Fund		
25/7/7/25	131	WEW Pension Fund		
25/7/7/8	132	Namcor Pension Fund	97	36 199 176,00
25/7/7/385	133	Metropolitan Preservation Pension Fund	102	16 752 000,00
25/7/7/564	134	Ubuntu Retirement Fund(Bonlife Retirement Fund)	729	3 235 315,00
25/7/7/384	135	Metropolitan Preservation Provident Fund	23	2 683 000,00

Appendix E: Summary of survey responses from Investment Managers respondents

Table 31: Summary of survey responses from Investment Managers respondents

Respondent	A	B	C	D	E	investment Managers
1. Does the fund fully recognise infrastructure as a unique asset class with distinct economic and financial characteristics?						
Yes	√	√	√	√	√	5
No						0
Not Sure						0
2. If Answer to 1 is “Yes”, Select financial and economic characteristics that make infrastructure investment attractive						
Attractive returns			√	√		2
Stable (Low sensitivity to economic cycles) returns	√	√		√	√	4
Low Correlation with other asset classes(diversification potential)					√	1
Long term stable and predictable returns	√			√	√	3
Good inflation hedged returns	√	√		√	√	4
Low default Rate	√		√			2
High barrier to entry		√				1
None of the above						0
3. If Answer to 1 is “No”, Select feature that makes infrastructure unattractive						
Low liquidity	√					1
investment too risky						0
Long investment horizon						0
Lack of financial instruments						0
High capital requirement	√					1
Not applicable						0
4. What makes infrastructure investment(assets) too risky						

High construction and patronage risk	√	√	√	√	√	5
Unfair risks allocation in Public Private Partnerships		√	√	√		3
Lack of government support framework			√	√		2
High regulatory and political risk		√	√	√	√	4
High credit risks					√	1
Technology no mature and prove in the local context						0
All of the Above						0
High upfront costs -development risk - may not get to financial close						0
5. The Pension Fund has a target allocation to infrastructure assets						
Yes	√		√	√		3
No		√			√	2
Not Sure						0
6. What is the allocation in Percentage	0	0,10	4,50	100		
	%	%	%	%		
7. The Pension Fund has internal resources and investment expertise to manage infrastructure investment?						
Yes			√	√	√	3
No	√	√				2
8. If the answer to 7 is No, selected motivation						
Costly to keep expertise internal	√	√				2
Lack of scale to manage investments inhouse	√					1
Asset managers can do it better at lower costs						0
Not enough infrastructure investment to warrant internal expertise	√					1
9. Select the instruments used for investments in infrastructure assets						
Listed Funds						0

Listed equities/shares						0
Unlisted(private) equity				√		1
Unlisted Funds			√			1
Direct Borrowing(OTC) - debt		√			√	2
Bonds						0
Other	√					1
10. Does the financial Instrument align with Pension Fund or asset manager investment strategy(risk-return)						
Yes	√	√	√	√	√	5
No						0
11. In relation to Answer in 9), What is the instrument's Investment Horizon?						
Short-term(1-3 years)						0
Medium Term(4-6 years)		√		√		2
Long-term (>7 years)	√		√		√	3
Not applicable						0
12. In relation to Answer in 9) What is the instrument's Liquidity levels?						
Low	√	√	√	√	√	5
Medium						0
High						0
Not applicable						0
13. In relation to Answer in 9) What is the instrument's Riskiness?						
Low	√					1
Medium		√	√		√	3
High				√		1
Not applicable						0
14. In relation to Answer in 9), What is the instrument's scale of capital investment?						

Low						0
Medium		√	√			2
High	√			√	√	3
Not applicable						0
15. In relation to Answer in 9) and 13 what is the level of exposure to Regulatory and political risks						
Low						0
Medium	√	√	√			3
High				√	√	2
Not applicable						0
16. Is there a steady stream of bankable infrastructure projects/opportunities						
Yes					√	1
No	√	√	√	√		4
17. If the answer to 16 is "No"						
The project not viable on their own	√		√	√		3
Lack of financial instruments			√	√		2
Infrastructure project not sufficiently development	√		√	√	√	4
Implementing agencies Lack of expertise in project development			√	√	√	3
Lack of or ineffective public procurement policies and processes	√	√	√	√	√	5
Lack of or ineffective public private partnership policies			√	√		2
Lack of government support	√	√	√	√		4
Lack of infrastructure Development Plan			√	√		2
Unfair risk allocation to private parties in PPP Projects		√	√	√		3
Lack of Project Preparation(feasibility Studies) Funding			√	√	√	3
18. Are there any effective and efficient public procurement policies for infrastructure development						
Yes	√		√		√	3

No		√		√		2
19. Are there effective and efficient Public Private Partnership policies for infrastructure development						
Yes	√				√	2
No		√	√	√		3
20. Is there a Fair risk allocation between Public and Private Sector in Public Private Partnership projects? i.e Demand risk	1	2	2	2	2	
Public	√					1
Private		√	√	√	√	4
Private Risk Insurance						0

Appendix F: Summary of survey response from Pension Funds respondents

Table 32: Summary of survey response from Pension Funds respondents

Respondent	A	B	C	D	E	F	G	H	I	J	K	L	M	Total
1. Does the fund fully recognise infrastructure as a unique asset class with distinct economic and financial characteristics?														
Yes	√				√		√	√			√	√		6
No		√	√	√		√				√	√			7
Not Sure														0
2. If Answer to 1 is “Yes”, Select financial and economic characteristics that make infrastructure investment attractive														
Attractive returns	√						√	√						3
Stable (Low sensitivity to economic cycles) returns	√										√	√		3
Low Correlation with other asset classes(diversification potential)	√						√				√			3
Long term stable and predictable returns	√				√						√			3
Good inflation hedged returns	√										√			2
Low default Rate	√													1
High barrier to entry	√													1
None of the above														0
3. If Answer to 1 is “No”, Select feature that makes infrastructure unattractive														
Low liquidity		√	√	√	√	√				√			√	7
investment too risky	√					√								2
Long investment horizon										√				1
Lack of financial instruments										√				1
High capital requirement	√	√	√	√						√				5

Not applicable	√				√										2
14. Select the instruments used for investments in infrastructure assets															
Listed Funds															0
Listed equities/shares															0
Unlisted(private) equity	√	√	√	√		√	√	√	√	√		√			10
Unlisted Funds					√							√			2
Direct Borrowing(OTC) - debt															0
Bonds														√	1
Other															0
15. Does the financial Instrument align with Pension Fund or asset manager investment strategy(risk-return)															
Yes	√	√	√	√	√	√	√	√	√	√	√	√	√	√	12
No											√				1
16. In relation to Answer in 14), What is the instrument's Investment Horizon?															
Short-term(1-3 years)															0
Medium Term(4-6 years)	√				√						√				3
Long-term (>7 years)		√	√	√		√	√	√	√	√	√	√	√	√	10
Not applicable															0
17. In relation to Answer in 14), What is the instrument's Liquidity levels?															
Low	√	√	√	√	√	√		√		√				√	9
Medium							√			√	√	√			4
High															0
Not applicable															0
18. In relation to Answer in 14), What is the instrument's Riskiness?															
Low							√						√	√	3

Medium	√					√		√		√	√			5
High		√	√	√	√					√				5
Not applicable														0
19. In relation to Answer in 14), What is the instrument's scale of capital investment?														
Low						√	√	√			√			4
Medium	√	√	√	√							√			5
High								√			√	√	√	4
Not applicable														0
20. In relation to Answer in 14), and 16), what is the level of exposure to Regulatory and political risks														
Low						√	√				√	√		4
Medium	√				√			√	√	√				5
High		√	√	√									√	4
Not applicable														0
21. Is there a steady stream of bankable infrastructure projects/opportunities														
Yes							√			√	√			3
No	√	√	√	√	√	√		√	√			√	√	10
22. If the answer to 21 is "No"														
The project not viable on their own	√													1
Lack of financial instruments	√								√				√	3
Infrastructure project not sufficiently development	√				√			√					√	4
Implementing agencies Lack of expertise in project development	√								√					2
Lack of or ineffective public procurement policies and processes	√					√							√	3
Lack of or ineffective public private partnership policies	√	√	√	√									√	5
Lack of government support		√	√	√										3

Lack of infrastructure Development Plan	√	√	√	√	√					√		√		7
Unfair risk allocation to private parties in PPP Projects	√													1
Lack of Project Preparation(feasibility Studies) Funding	√												√	2
24. Are there any effective and efficient public procurement policies for infrastructure development														
Yes												√	√	2
No	√	√	√	√	√	√	√	√	√	√	√			√ 11
25. Are there effective and efficient Public Private Partnership policies for infrastructure development														
Yes			√	√	√	√					√	√	√	√ 8
No	√						√	√	√	√				5
26. Is there a Fair risk allocation between Public and Private Sector in Public Private Partnership projects? i.e Demand risk														
Public							√			√	√	√		4
Private	√									√			√	3
Private Risk Insurance					√									1

Appendix G: Investment Manager Response Coded Data

Table 33: Investment Manager Response Coded Data

Respondents	A	B	C	D	E
1. Does the fund fully recognise infrastructure as a unique asset class with distinct economic and financial characteristics?	4	4	4	4	4
2. If Answer to 1 is "Yes", Select financial and economic characteristics that make infrastructure investment attractive					
2.1 Attractive returns	2	2	4	4	2
2.2 Stable (Low sensitivity to economic cycles) returns	4	4	2	4	4
2.3 Low Correlation with other asset classes(diversification potential)	2	2	2	2	4
2.4 Long term stable and predictable returns	4	2	2	4	4
2.5 Good inflation hedged returns	4	4	2	4	4
2.6 Low default Rate	4	2	4	2	2
2.7 High barrier to entry	2	4	2	2	2
2. 8 None of the above	2	2	2	2	2
3. If Answer to 1 is "No", Select feature that makes infrastructure unattractive					
3.1 Low liquidity	4	2	2	2	2
3.2 investment too risky	2	2	2	2	2
3.3 Long investment horizon	2	2	2	2	2
3.4 Lack of financial instruments	2	2	2	2	2
3.5 High capital requirement	4	2	2	2	2
3.6 Not applicable	2	2	2	2	2
4. What makes infrastructure investment(assets) too risky					
4.1 High construction and patronage risk	4	4	4	4	4
4.2 Unfair risks allocation in Public Private Partnerships	2	4	4	4	2
4.3 Lack of government support framework	2	2	4	4	2
4.4 High regulatory and political risk	2	4	4	4	4
4.5 High credit risks	2	2	2	2	4

4.6 Technology no mature and prove in the local context	2	2	2	2	2
4.7 All of the Above	2	2	2	2	2
5. The Pension Fund has a target allocation to infrastructure assets	4	2	4	4	2
7. The Pension Fund has internal resources and investment expertise to manage infrastructure investment?	2	2	4	4	4
8. If the answer to 7 is No, selected motivation					
8.1 Costly to keep expertise internal	1	1	0	0	0
8.2 Lack of scale to manage investments in-house	1	0	0	0	0
8.3 Asset managers can do it better at lower costs	0	0	0	0	0
8.4 Not enough infrastructure investment to warrant internal expertise	1	0	0	0	0
9. Select the instruments used for investments in infrastructure assets					
9.1 Listed Funds	2	2	2	2	2
9.2 Listed equities/shares	2	2	2	2	2
9.3 Unlisted(private) equity	2	2	2	4	2
9.4 Unlisted Funds	2	2	4	2	2
9.5 Direct Borrowing(OTC) - debt	2	4	2	2	4
9.6 Bonds	2	2	2	2	2
9.7 Other	4	2	2	2	2
10. Does the financial Instrument align with Pension Fund or asset manager investment strategy(risk-return)	4	4	4	4	4
11. In relation to Answer in 9), What is the instrument's Investment Horizon?	3	2	3	2	3
12. In relation to Answer in 9) What is the instrument's Liquidity levels?	1	1	1	1	1
13. In relation to Answer in 9) What is the instrument's Riskiness?	1	2	2	3	2
14. In relation to Answer in 9), What is the instrument's scale of capital investment?	3	2	2	3	3
15. In relation to Answer in 9) and 13 what is the level of exposure to Regulatory and political risks	2	2	2	3	3
16. Is there a steady stream of bankable infrastructure projects/opportunities	2	2	2	2	4
17. If the answer to 16 is "No"					
17.1 Project not viable on their own	4	2	4	4	2
17.2 Lack of financial instruments	2	2	4	4	2

17.3 Infrastructure project not sufficiently development	4	2	4	4	4
17.4 Implementing agencies Lack of expertise in project development	2	2	4	4	4
17.5 Lack or ineffective public procurement policies and processes	4	4	4	4	4
17.6 Lack or ineffective public private partnership policies	2	2	4	4	2
17.7 Lack of government support	4	4	4	4	2
17.8 Lack of infrastructure Development Plan	2	2	4	4	2
17.9 Unfair risk allocation to private parties in PPP Projects	2	4	4	4	2
17.10 Lack of Project Preparation(feasibility Studies) Funding	2	2	4	4	4
18. Are there any effective and efficient public procurement policies for infrastructure development	4	2	4	2	4
19. Are there effective and efficient Public Private Partnership policies for infrastructure development	4	2	2	2	4
20. Is there a Fair risk allocation between Public and Private Sector in Public Private Partnership projects? i.e Demand risk	1	2	2	2	2

Appendix H: Pension Fund survey response Likert Coded Data

Table 34: Pension Fund survey response Likert Coded Data

Respondent	A	B	C	D	E	F	G	H	I	J	K	L	M
1. Does the fund fully recognise infrastructure as a unique asset class with distinct economic and financial characteristics?	4	2	2	2	4	2	4	4	2	2	4	4	2
2. If Answer to 1 is "Yes", Select financial and economic characteristics that make infrastructure investment attractive													
2.1 Attractive returns	4	2	2	2	2	2	4	4	2	2	2	2	2
2.2 Stable (Low sensitivity to economic cycles) returns	4	2	2	2	2	2	2	2	2	2	4	4	2
2.3 Low Correlation with other asset classes(diversification potential)	4	2	2	2	2	2	4	2	2	2	4	2	2
2.4 Long term stable and predictable returns	4	2	2	2	4	2	2	2	2	2	4	2	2
2.5 Good inflation hedged returns	4	2	2	2	2	2	2	2	2	2	4	2	2
2.6 Low default Rate	4	2	2	2	2	2	2	2	2	2	2	2	2
2.7 High barrier to entry	4	2	2	2	2	2	2	2	2	2	2	2	2
2. 8 None of the above	2	2	2	2	2	2	2	2	2	2	2	2	2
3. If Answer to 1 is "No", Select feature that makes infrastructure unattractive													
3.1 Low liquidity	2	4	4	4	4	4	2	2	4	2	2	2	4
3.2 investment too risky	4	2	2	2	2	4	2	2	2	2	2	2	2
3.3 Long investment horizon	2	2	2	2	2	2	2	2	4	2	2	2	2
3.4 Lack of financial instruments	2	2	2	2	2	2	2	2	4	2	2	2	2
3.5 High capital requirement	4	4	4	4	2	2	2	2	4	2	2	2	2
3. 6 Not applicable	2	2	2	2	2	2	2	2	2	4	2	2	2
4. What makes infrastructure investment(assets) too risky													
4.1 High construction and patronage risk	2	2	2	2	4	4	4	4	4	2	2	4	2

4.2 Unfair risks allocation in Public Private Partnerships	2	2	2	2	4	2	2	2	4	2	4	2	4
4.3 Lack of government support framework	2	4	4	4	2	2	2	2	4	2	4	2	4
4.4 High regulatory and political risk	2	4	4	4	2	2	2	2	2	2	4	2	2
4.5 High credit risks	2	4	4	4	2	2	4	2	2	2	2	2	4
4.6 Technology no mature and prove in local context	2	2	2	2	2	2	2	2	2	2	2	2	2
4.7 All of the Above	4	2	2	2	2	2	2	2	2	4	2	2	2
5. The Pension Fund has a target allocation to infrastructure assets	2	2	2	2	2	2	4	4	2	2	4	4	2
7. The Pension Fund have internal resources and investment expertise to manage infrastructure investment?	2	2	2	2	2	2	2	2	2	2	2	2	2
8. If the answer to 7 is No, selected motivation													
8.1 Costly to keep expertise internal	4	4	4	4	2	2	4	2	4	2	2	2	2
8.2 Lack of scale to manage investments inhouse	2	2	2	2	2	2	2	2	4	2	2	2	4
8.3 Asset managers can do it better at lower costs	4	4	4	4	4	4	4	4	2	2	4	4	4
8.4 Not enough infrastruture investment to warrant internal expertise	2	2	2	2	4	2	2	2	2	4	2	2	2
9. Do Pension Fund members have a choice in term of the risk level in which their savings are invested?	2	4	4	4	4	2	2	4	2	2	2	4	4
10. If Answer to 9) is Yes, What is impact on Pension Fund's target Investment Horizon	4	4	4	4	3	4	4	3	4	4	4	3	1
11. If Answer to 9) is Yes, What is impact Pension Fund's Liquidity	4	1	1	1	1	4	4	1	4	4	4	1	2
12.If Answer to 9) is Yes, What is impact on Pension Fund Risk Appetite/tolerance	4	1	1	1	4	4	4	1	4	2	4	1	1

13. If Answer to 9) is Yes, What is impact on Pension Fund scale of capital Investment	4	1	1	1	4	4	4	2	4	4	4	3	3
14. Select the instruments used for investments in infrastructure assets													
14.1 Listed Funds	2	2	2	2	2	2	2	2	2	2	2	2	2
14.2 Listed equities/shares	2	2	2	2	2	2	2	2	2	2	2	2	2
14.3 Unlisted(private) equity	4	4	4	4	2	4	4	4	4	4	2	4	2
14.4 Unlisted Funds	2	2	2	2	4	2	2	2	2	2	4	2	2
14.5 Direct Borrowing(OTC) - debt	2	2	2	2	2	2	2	2	2	2	2	2	2
14. 6 Bonds	2	2	2	2	2	2	2	2	2	2	2	2	4
14.7 Other	2	2	2	2	2	2	2	2	2	2	2	2	2
15. Does the financial Instrument align with Pension Fund or asset manager investment strategy(risk-return)	4	4	4	4	4	4	4	4	4	2	4	4	4
16. In relation to Answer in 14), What is the instrument's Investment Horizon?	2	3	3	3	2	3	3	3	3	2	3	3	3
17. In relation to Answer in 14), What is the instrument's Liquidity levels?	1	1	1	1	1	1	2	1	2	1	2	2	1
18. In relation to Answer in 14), What is the instrument's Riskiness?	2	3	3	3	3	2	1	2	3	2	2	1	1
19. In relation to Answer in 14), What is the instrument's scale of capital investment?	2	2	2	2	1	1	1	3	1	2	3	3	3
20. In relation to Answer in 14) and 16), what is the level of exposure to Regulatory and political risks	2	3	3	3	2	1	1	2	2	2	1	1	3
21. Is there a steady stream of bankable infrastructure projects/opportunities	2	2	2	2	2	2	4	2	2	4	4	2	2
22. If the answer to 21 is "No"													
22.1 Project not viable on their own	4	2	2	2	2	2	2	2	2	2	2	2	2
22.2 Lack of financial instruments	4	2	2	2	2	2	2	2	4	2	2	2	4

22.3 Infrastructure project not sufficiently development	4	2	2	2	4	2	2	4	2	2	2	2	4
22.4 Implementing agencies Lack of expertise in project development	4	2	2	2	2	2	2	2	4	2	2	2	2
22.5 Lack or ineffective public procurement policies and processes	4	2	2	2	2	4	2	2	2	2	2	2	4
22.6 Lack or ineffective public private partnership policies	4	4	4	4	2	2	2	2	2	2	2	2	4
22.7 Lack of government support	2	4	4	4	2	2	2	2	2	2	2	2	2
22.8 Lack of infrastructure Development Plan	4	4	4	4	4	2	2	2	4	2	2	4	2
22.9 Unfair risk allocation to private parties in PPP Projects	4	2	2	2	2	2	2	2	2	2	2	2	2
22.10 Lack of Project Preparation(feasibility Studies) Funding	4	2	2	2	2	2	2	2	2	2	2	2	4
24. Are there any effective and efficient public procurement policies for infrastructure development	2	2	2	2	2	2	2	2	2	2	4	4	2
25. Are there effective and efficient Public Private Partnership policies for infrastructure development	2	4	4	4	4	2	2	2	2	4	4	4	4
26. Is there a Fair risk allocation between Public and Private Sector in Public Private Partnership projects? i.e Demand risk	2	2	2	2	2	4	2	2	4	2	4	4	2