Gordon Institute of Business Science
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# Macroeconomic Factors Affecting Successful Leveraging of Private Finance for Infrastructure Development

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A research project submitted to the Gordon Institute of Business Science, University of Pretoria, in partial fulfilment of the requirements for the degree of Master of Business Administration

02 November 2021

## Abstract

A country's level of infrastructure can influence its residents' well-being, environmental protection, knowledge creation, and economic competitiveness. Due to rapidly increasing urbanisation and concomitant requirements for better infrastructure, the public sector, the traditional provider of infrastructure, is under duress to provide the required capital for infrastructure development. It is generally widely acknowledged that additional funding needs to be mobilised from the private sector for infrastructure development.

Several factors, including macroeconomic factors, affect the mobilisation of private sector finance for infrastructure development. Though the importance of macroeconomic factors in attracting private sector finance has been stated by many scholars, very few studies have been undertaken to identify them, specifically in the South African context.

A qualitative exploratory research approach was adopted to identify the relevant macroeconomic factors and how they influence the private sector financing of infrastructure projects. In the study, 12 in-depth semi-structured interviews were conducted with experienced professionals engaged in debt, mezzanine, and equity financing of infrastructure projects.

The study established that relevant macroeconomic factors affect the project financing decisions of the private sector. The findings contributed to the development of a framework to leverage the identified macroeconomic factors to attract private sector finance for infrastructure development. In addition, this study contributes to the general body of academic literature on this subject.

## Key Words

Macroeconomic factors, Project finance, Infrastructure development, Macroeconomic risks and mitigation measures

## Declaration

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

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# Chapter 1: Introduction to Research Problem

## 1.1 Background

Infrastructure lies at the core of development as no country can function without infrastructure. Infrastructure connects people with people and economic opportunities, delivers essential services, and sustains economic activities. A country's infrastructure level can influence the well-being of residents, environmental protection, knowledge creation, and economic competitiveness in those areas (Collier & Venables, 2016). Infrastructure can boost a region's growth, socioeconomic development, and economic and production capacity (Nijkamp, 1986, as cited in Palei, 2015). It has been found that economic growth is closely linked with public infrastructure development (Alm, 2015) and a ten percent increase in infrastructure assets results in one percent growth in the Gross Domestic Product (GDP) (Beckers & Stegemann, 2013). The quality of infrastructure affects a region's investment climate, attractiveness, and competitive conditions (Martinkus & Lukasevicius (2008) as cited in Palei (2015); Snieska & Simkunaite (2009)). Palei (2015) confirms and clarifies the positive link between infrastructure development and economic growth. Infrastructure helps to improve production capacity, reduce input and transaction costs, and improve labour productivity. By linking poor and undeveloped areas to businesses and economic activities, infrastructure contributes to socio-economic development. Infrastructure development creates jobs in construction and related industries which in turn improves the local economy. In addition, all Sustainable Development Goals (SDGs) are directly or indirectly influenced by infrastructure (Adshead, Thacker, Fuldauer & Hall, 2019), and 92 percent of the SDG targets are directly or indirectly influenced by infrastructure (Thacker, Fuldauer & Hall, 2018).

Infrastructure is considered a public good, and governments are regarded as being responsible for providing it (United Nations Environment Programme, 2021). Historically, governments and government entities paid most of the investment for infrastructure development off their balance sheets. Approximately 83 percent of global infrastructure investment comes from the public sector. In Africa, the share of the public sector is 95 percent (World Bank, 2017). The public sector's involvement in infrastructure provision became increasingly prominent in the twentieth century post-depression era as the public sector, influenced by Keynesian fiscal

management policies, started to undertake large-scale infrastructure projects. Before that, private companies usually constructed roads, bridges and public transport in many parts of the world in the nineteenth century and collected user charges. The situation has shifted since the 1980s. In the last four decades, there has been an upward trend in the private sector's involvement in financing, developing and operating infrastructure projects through the public-private partnership (PPP or P3) model (O'Neill, 2017).

The development of infrastructure is costly and capital-intensive (Tamošaitienė, Savari, Chan, & Cristofaro, 2021), and it will require a total investment of approximately US$71 trillion globally between 2015 and 2030 to finance physical infrastructure projects. Between 60 percent and 70 percent of such investment requirements are from emerging economies (OECD, 2015a). According to a Global Infrastructure Hub (2017) estimate, there is a gap of US$15 trillion between infrastructure investment needs and the availability of finances.

The World Bank (2017) and the United Nations Environment Programme (UNEP) (2021) have advised mobilising finance from the private sector. It is generally considered that the involvement of the private sector in financing reduces the fiscal burden on governments, increases efficiency in services, and improves infrastructure performance (Youssef & Nahas, 2017). Development finance institutes generally agree that involving the private sector in infrastructure financing is beneficial (OECD, 2017; World Bank, 2017; UNEP, 2021), and many policy intercessions and technical interventions have been proposed to attract private finance for infrastructure development.

There is an ongoing discourse that trillions of dollars of private capital are available for infrastructure development that simply need to be unlocked (Clark, Reed, & Sunderland, 2018). This suggests that despite the existence of a considerable volume of private capital seeking positive returns, there are gaps in funding from the private sector to the infrastructure sector.

Many scholars have sought to explore the factors influencing private financiers to invest in infrastructure projects. Banerjee, Oetzel, and Ranganathan (2006) found that a country's macroeconomic environment, the effectiveness of the legal and regulatory structures, and ability to enforce contracts influence its ability to attract

private investment for infrastructure development. Zhu and Chua (2018) found that financiers consider the political environment, macroeconomic environment, stakeholders' credibility, and financial market as the four most important factors for infrastructure investment. A study covering China conducted by Chan, Lam, Chan, Cheung and Ke (2010) found that the principal factors to leveraging finance for infrastructure projects are a stable macroeconomic environment, appropriate risk allocation and sharing, transparent and efficient procurement processes, stable political and social environment, and judicious government control. Gatti (2013) and Yescombe (2007) consider political, social, macroeconomic and regulatory factors influence infrastructure project financing decisions. In a study aiming to define a suitable public-private partnership (PPP) ecosystem in the European context, Leviäkangas, Kinnunen, and Aapaoja (2016) advise developing a sound macroeconomic environment and financial market to leverage finance for infrastructure development. The importance of institutional factors such as public sector investment, regulatory capacity and corruption and macroeconomic factors has been highlighted by Fay, Matrimort, and Straub (2021). Chan et al. (2010) found that macroeconomic, political and social factors affect all phases of infrastructure projects. Klingebiel and Ruster (2000) argue that effective macroeconomic framework, political stability, and effective financial sector policies are essential for creating a conducive environment to encourage private participation in infrastructure development. In the absence of the above factors, the cost of capital to investors will increase, which may ultimately result in the non-availability or limited availability of private capital. It can be observed that many studies have highlighted the importance of macroeconomic factors in attracting private finance for infrastructure development.

The relative importance of macroeconomic factors for attracting private sector finance for infrastructure development is underlined by Rao (2018), Chan et al. (2010), and Campanella, Serino, Nelli, and Graziano (2018). Rao (2018) postulates that banks place more importance on macroeconomic factors than on the financial outcomes of projects to make a project financing decision. In a study covering various infrastructure projects in BRICS (Brazil, Russia, India, China and South Africa) and five European countries (Portugal, Ireland, Italy, Greece and Spain, also known as PIIGS), Campanella et al. (2018) found that project finance performance and sustainability are influenced more by macroeconomic factors than other factors.

Similarly, Ruiz Díaz (2020) found that an infrastructure project's success depends extensively on external financial and macroeconomic conditions.

The number of studies focusing specifically on identifying and exploring macroeconomic factors is limited, and the full range of macroeconomic factors affecting PPP and project financing decisions is not yet comprehensively explored (Yurdakul, Kamaşak, & Öztürk, 2021). In addition, scholars hold diverse views on what factors could be considered macroeconomic factors. For example, Yescombe (2007), Crăciun (2011), and Platona, Simona and Constantinescu (2014) consider inflation rate, interest rate, and exchange rate are the only macroeconomic factors, and legal and regulatory framework is closely related to macroeconomic factors. The political, regulatory and country factors that can control a country's macroeconomic environment, such as the nationalisation of infrastructure assets, are also considered as macroeconomic factors by Gatti (2013). The UN-OHRLLS (2020) considers political factors, tax policies, and public opinion part of macroeconomic factors. According to Chan et al. (2010), economic policy, legal framework, macroeconomic conditions, and availability of financial markets are macroeconomic factors. It can be observed that the various scholars have different opinions on what aspects are considered as macroeconomic factors. Looking at the variations in macroeconomic factors affecting project financing decisions, Campanella, Serino, Nelli and Graziano (2018) conclude that these factors are geography-specific.

## 1.2 South African Context

Since 2009 South Africa has failed to achieve its infrastructure investment targets (National Treasury, 2021). It is estimated that by 2040, South Africa will need US$441 billion infrastructure investment, but the projected availability is US$289 billion (Global Infrastructure Hub, 2017). Hence, there is an investment gap of US$152 billion that needs to be mobilised from non-traditional actors.

The National Treasury (2020) recognises that the government is incapable of meeting the financial resources required to meet the target and advises that the shortfall is addressed in collaboration with the private sector, labour and civil society. It also advises scholars and academics to identify the main barriers for investors to participate in infrastructure development projects. Phalatse (2021) found that the

key barriers to private sector infrastructure financing in South Africa are the lack of bankable projects, high macroeconomic risks (high debt to GDP), and a weak policy environment.

Recently the government of South Africa implemented the South African Economic Reconstruction and Recovery Plan (2020) to promote recovery within the country in relation to the economic stress created by the COVID-19 pandemic (South African Government, 2020). According to this plan, the delivery of public infrastructure will play an important role in the country's economic reconstruction and delivery. The plan advocates for unlocking private sector finance for infrastructure development through implementing public-private partnership (PPP) projects. The plan has placed some emphasis on creating a conducive environment for private sector investment and recommends a set of interventions in various fields, including macroeconomic, institutional, and regulatory factors. The plan's success is heavily dependent on the government's ability to mobilise private funding, and the macroeconomic environment plays a significant role in attracting private sector funding.

## 1.3 Research Motivation

Many scholars and organisations have emphasised the importance of infrastructure development in achieving the socio-economic development of a region or country. South Africa seeks to achieve socio-economic development through infrastructure development and to recover from the economic downturn caused by the COVID-19 pandemic. However, it is now widely acknowledged that the public sector cannot meet the financial needs for such development, and greater private sector participation is required to finance the required level of infrastructure development. The level of private sector participation in infrastructure financing depends on many factors, including political, regulatory, and macroeconomic factors.

While the importance of macroeconomic factors in mobilising private finance is acknowledged, the number of academic articles exploring the effects of macroeconomic factors on project financing decisions is limited (Yurdakul et al., 2021). The researcher could not identify literature exploring the macroeconomic factors affecting private sector decisions on financing infrastructure projects in the South African context.

In the context of the above, this study aims to identify the macroeconomic factors affecting infrastructure project financing decisions and to explore how those factors influence project finance decisions.

## 1.4 Research Contribution and Benefits

The research will have three key benefits. First, it will identify the macroeconomic factors that influence infrastructure financing decisions in South Africa. Second, the identification of the macroeconomic factors will inform project sponsors and the public sector about project financiers' perceptions of positive and negative aspects of the macroeconomic environment. This will eventually assist in taking the necessary steps to create a conducive environment for mobilising private funding for infrastructure development, implementing the South African Economic Reconstruction and Recovery Plan of 2020 and achieving the plan's economic development goals. Third, this study will contribute to the general body of academic literature and augment previous global empirical findings in the infrastructure financing area with the most recent information.

# Chapter 2: Literature Review

## 2.1 Introduction

This chapter defines infrastructure financing, identifies factors associated with it, and provides an overview of the available literature related to the subject. The chapter further discusses macroeconomic factors in infrastructure project financing, specifically in the South African context.

## 2.2 Key Role Players in Infrastructure Financing

Infrastructure is generally considered a public good, but governments historically involved the private sector until the twentieth century (Sclar, 2015). O'Neill (2017) notes that private companies used to build roads, bridges, and public transport in many parts of the world in the nineteenth century and collected user charges. Public sector involvement in infrastructure provision became prominent in the twentieth century post-depression era as the public sector, influenced by Keynesian fiscal management policies, started to undertake large-scale infrastructure projects. During this period, the private sector participated in the infrastructure sector through the bond market. The situation has begun to change in the last four decades as fiscal, and public policy trends have encouraged private sectors to develop, own and operate infrastructure assets through the public-private partnership (PPP or P3) model. In this model, infrastructure is financed, developed and managed by private and public entities in a partnership where the main interest of private entities lies in preserving capital and earning a good return on investment. The public entities, therefore, aim to provide high-quality public service at a low cost (Sclar, 2015).

The following section provides a snapshot of the key actors involved in financing infrastructure development and their intentions behind financing decisions (Gatti, 2013; UN-OHRLLS, 2020).

i. Commercial Lenders: Commercial lenders aim to maximise profit from their investments. Lenders evaluate risk profiles of the projects or assess the level of risks associated with their investment to decide on the lending amount and

terms such as the percentage of debt (leverage), duration and costs of the loan.

ii. Private Equity Investors: In recent years, equity has started to flow in from private equity companies that are not part of the project in terms of developer or sponsor. Unlike project sponsors, private equity investors can recover their investment only through residual cashflows after paying all operational expenses and debt holders. Private equity investments can assist in quicker and better project delivery. In return, they have an opportunity to diversify portfolios, gain long-term benefits, and invest in low volatilities assets (Gemson, Gautami & Rajan, 2012).

iii. Private Developers: A private company engaged in executing a project and/or managing and operating the infrastructure after project execution wants to maximise profitability and potential returns on their investment. Private developers invest only in those projects where the potential benefits are higher than the costs and within an acceptable level of risk.

iv. Public Sector: The public sector finances a project if it can help achieve the government's development plans and policy objectives such as employment generation, attaining social, environmental and economic returns, improving connectivity, and addressing citizens' needs. Some governments also place importance on the cost-effectiveness and financial viability of their investment when deciding on financing a project.

v. Donor/ Development Partner: Donors consider the potential developmental impact of infrastructure to determine whether to finance it. The developmental impact primarily refers to positive social, economic and environmental outcomes such as gender equality, poverty alleviation, increased access to education, and environmental sustainability.

vi. International Finance Institutions (IFIs): Examples of IFIs include multilateral development banks (MDB), regional development banks, bi-lateral development banks, and Bretton Woods institutions. IFIs generally place importance on both social outcomes and the financial soundness of a project to make financing decisions. They may also consider financing a project if it can unlock the region's development potential.

vii. Special Funds: Special funds such as adaptation funds and climate change funds primarily consider a project's ability to meet its objectives, such as reducing greenhouse gas emissions.

To summarise, financial investors of infrastructure projects have expectations of their investment in the project. The private sector's primary expectation is maximising financial returns or profits from their investment, whereas the public sector and IFIs place more importance on the developmental outcome of their investment.

## 2.3 Financing Instruments

In infrastructure development projects, capital is generally raised in a combination of both debt and equity, and the proportion of the debt can go up to 90% of the project value. The debt is generally obtained from commercial banks, whereas equity is raised from project developers and sponsors (Thillairajan & Menon, 2014).

The following section provides an overview of the various financing instruments available for private sector financiers to utilise in infrastructure development projects.

### 2.3.1 Debt

Debt is provided in two ways –bank loans and bonds.

Bank Loan: A bank loan or senior debt is provided by commercial banks. Bank loans can go up to 90 percent of the total project cost. Bank loans generally earn the lowest interest rate and bear the lowest risks as bank loans are paid off first (OECD, 2015b). The interest rate at which banks provide loans varies with the change in interbank rate (Johannesburg Interbank Average Rate or JIBAR in South Africa) over the duration of the loan term. Typically, each loan is provided by a syndicate of banks as syndication helps the banks to spread risk by limiting exposure and pools finances for large projects which may be too large for any single bank to finance. Two or more commercial banks create a syndicate for each loan, and each syndicate is led by one bank. The lead bank is called the lead arranger, and the other banks are called syndicated banks.

Bond: A project or infrastructure bond is a mechanism for the private sector, especially institutional investors such as pension and insurance companies, to invest in infrastructure through debt instruments. Private entities also issue project bonds to raise finance for infrastructure development.

For project developers, bond financing is beneficial as bond terms are generally long, up to 30 years, and financing terms can be better than those offered by commercial banks. Ehlers (2014) considers infrastructure bonds an attractive investment alternative as these bonds have a better recovery rate than corporate bonds and a higher credit rating than those issued by non-financial corporate issuers.

### 2.3.2 Equity

In recent years, equity has started to flow in from private equity companies that are not part of the project in terms of developer or sponsor. Private equity investments can assist in quicker and better project delivery (Gemson, Gautami & Rajan, 2012). For private equity investors, project finance can provide an opportunity to diversify portfolios, gain long term benefits, and invest in low volatilities assets. However, unlike project sponsors, private equity investors can recover their investment only through residual cashflows after paying all operational expenses and debt holders.

### 2.3.3 Mezzanine Finance

In addition to debt and equity instruments, financiers can invest in infrastructure through hybrid instruments such as mezzanine finance. This is a type of debt instrument but with equity-like participation. It bridges the gap between debt and equity instruments and carries higher risk and return than senior issues. For institutional investors such as pension funds and insurance funds, mezzanine debt has emerged as a niche investment area (OECD, 2015b).

Private sector investors typically participate in the financing of infrastructure development through project finance mechanisms (OECD, 2015b). The following section provides an overview of the project finance mechanism.

## 2.4 What is Project Finance?

According to Gatti (2013), project finance is a type of structured finance in which a special purpose vehicle (SPV) is created as a specific economic entity to develop infrastructure projects such as power plants, roads and ports by project sponsors. The SPV borrows money from lenders, repays the loan using the cash generated by the infrastructure, and utilises the project assets as collateral. According to Esty (2003), project finance is a form of highly levered financing (often 70 percent or more) through a standalone project entity (SPV) by limited numbers of equity and debt financiers.

Project finance has the following distinct characteristics (Gatti, 2013; Weber, Staub-Bisang, & Alfen, 2016):

i. Project sponsors establish a financially and legally independent SPV. This SPV works as the project company and debtor.

ii. Lenders have little or no recourse against project sponsors or their assets.

iii. The project's risks are shared among the parties in accordance with their ability to manage and control them.

iv. The SPV must be able to generate sufficient revenue or cash flow from operating the infrastructure to cover operations and loan reimbursement costs. Project sponsors receive dividends only after covering these costs.

v. Project cash inflows and assets are considered as collateral provided by project sponsors to lenders.

Project finance is thus a highly levered structured financing tool utilised to finance infrastructure projects through an SPV established by project sponsors. Lenders can take project cash inflows and assets as collateral, but they have little or no recourse against project sponsors or their assets.

## 2.5 Project Finance Structure

A typical project finance structure involves the following entities (Pinto, 2017):

i. Project sponsors: Project sponsors establish an SPV, as previously explained. Project sponsors can be classified into four categories: (a) industrial sponsors who see the project is in some way linked to their business; (b) public sponsors or government bodies who aim to achieve social welfare or policy objectives; (c) contract sponsors who develop, build and run the infrastructure and inject equity and mezzanine debt into the initiative; and (d) purely financial investors who generally provide equity to the initiative (Gatti, 2013).

ii. Public Sector: The government or public sector authorises the SPV to operate the infrastructure and collect user charges/revenue.

iii. Lenders or commercial banks: This group provides debt to the SPV. Lenders generally comprise a lead arranging bank and multiple participating banks.

iv. Suppliers: Suppliers are responsible for supplying raw materials to the SPV for project execution and operation after developing the project.

v. Constructors: Constructors are the entities responsible for developing the infrastructure on behalf of the SPV.

vi. Operators: Operators are responsible for operating and managing the infrastructure after its development.

vii. Product purchasers: Product purchasers or customers buy the products and services generated by the SPV, such as users of a toll road.

Figure 2-1 below depicts the relationships among the entities.

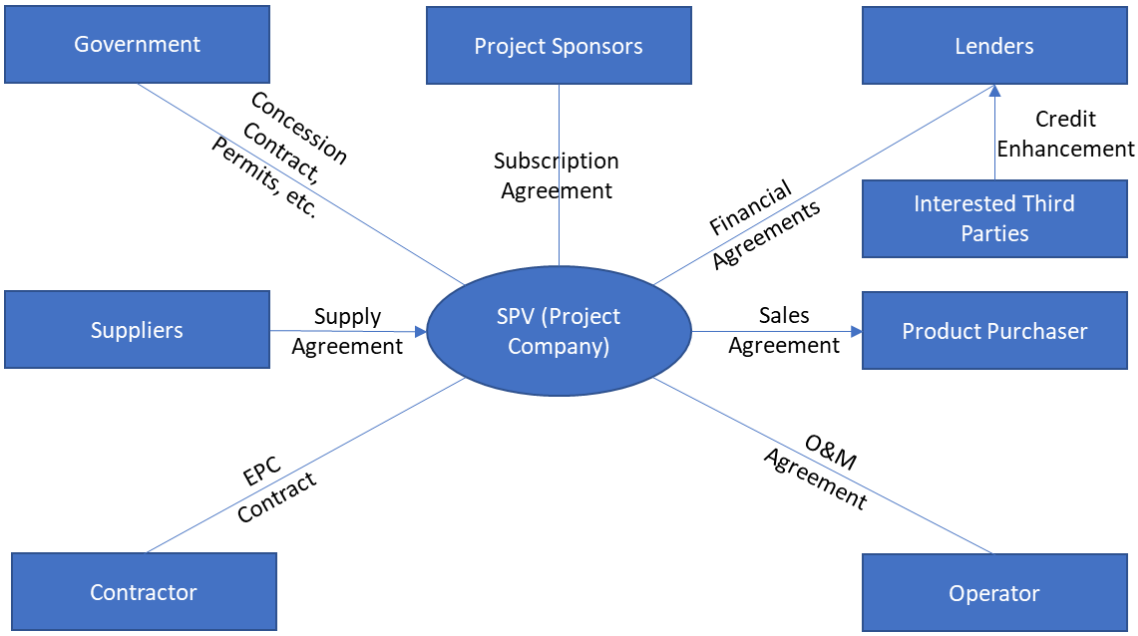


**Figure 2-1: Project finance structure**

Source: Adapted from Pinto (2017)

## 2.6 Macroeconomic Factors in Project Finance

### 2.6.1 Definition of Macroeconomic Factors

In the context of this study, macroeconomic factors refer to the country's macroeconomic environment and its various aspects that affect project financing decisions (Crăciun, 2011). Scholars and organisations hold varying opinions on what these factors are. For example, Yescombe (2007), Crăciun (2011) and Platona, Simona and Constantinescu (2014) consider that inflation rate, interest rate and exchange rate are the only macroeconomic factors, and legal and regulatory frameworks are closely related to macroeconomic factors. Gatti (2013) suggests that political, regulatory and country factors that can control a country's macroeconomic environment, such as the nationalisation of infrastructure assets are also macroeconomic factors. Similar to Gatti (2013) and UN-OHRLLS (2020), Chan et al. (2010) provide a broader perspective of the macroeconomic environment that includes sound economic policy, favourable legal framework, stable macroeconomic conditions, appropriate risk allocation and risk sharing, and multi-benefit objectives.

### 2.6.2 Components of Macroeconomic Factors

**Inflation**

Literature suggests that inflation plays a major role in financing decisions by commercial lenders, private investors and institutional investors. According to Rao (2018), the weighted average cost of capital (WACC) is affected by inflation. WACC increases the asset's net present value (NPV) when inflation rises, posing a credit risk to lenders. Inflation also affects institutional and private investors who generally look for long-term and inflation-protected returns (UN-OHRLLS, 2020). A high inflation rate thus deters commercial lenders, institutional investors and private investors from financing infrastructure projects. An example of a project severely impacted by inflation is the Beitbridge –Harare Road in Zimbabwe. The high inflation rate in the country failed to attract private financiers; hence the government decided to build the road using its public funds (UN-OHRLLS, 2020).

**Currency Exchange Rate**

Fluctuations in the currency exchange rate cause problems if the currency of revenue earned is different from the currency of investment. Any devaluation of the revenue-earning currency might result in credit risk to lenders and return risk to investors (Crăciun, 2011, Yescombe, 2007, Gatti, 2013). Fluctuation in the currency exchange rate does not create a problem if the exchange rate between the two currencies is fixed.

**Interest Rate**

Infrastructure projects are generally financed through long term loans, and the borrowing interest rates may fluctuate multiple times during the entire term of the loan. For creditors, typically the lending interest rate is a summation of the reference rate and risk premium. The reference rate depends primarily on the central bank's monetary policy and interest rates, while the risk premium rate depends on the project's characteristics and risks involved with it. Since the borrowings for infrastructure are generally long-term, the economy goes through at least one cycle of increase and decrease of the reference rate during that period. There are also cases where creditors agree to lend money at a fixed interest rate for a specified duration (Crăciun, 2011). In the context of the present study, the way in which

different factors influence creditors in deciding on the type of interest rate and determining the interest rate is a material consideration.

**Macroeconomic Stability**

Sharma (2012), Chan et al. (2010) and Ruiz Díaz (2020) suggest that a stable macroeconomic condition promotes private financing in infrastructure development as a stable environment reduces the risks emanating from infrastructure projects' long-term borrowing characteristics. According to Sharma (2012), macroeconomic stability refers to the low and stable inflation rate, interest rate and currency exchange rate, and stable and effective regulatory and policy framework. In the context of project financing, Hammani, Ruhashyankiko, and Yehoue (2006) include foreign currency reserve requirements to the requirements for achieving macroeconomic stability.

**GDP and Income Level**

Kasri and Wibowo (2015) undertook a study covering 48 developing Islamic countries for the period 2000 to 2011 and found that the size of the country's economy, population and income level play crucial roles in attracting private finance for infrastructure development. However, they term these factors market factors as opposed to macroeconomic factors. Sharma (2012) provides evidence that the size of a country's economy (GDP) and income level contribute to attracting private finance for infrastructure development. Mengistu (2013) found that market size is an important determinant of financing decisions. The findings of the above studies are supported by the UN-OHRLLS (2020), with the performance of an economy described as a combination of GDP and per capita income and their growth trends as key macroeconomic factors influencing lenders to make project finance decisions.

Possible explanations of the above findings include:

(i) the size of a country's economy (GDP) can be used as a proxy to assess an economy's ability to provide liquidity in a project (Yescombe, 2007);

(ii) the population size of a country can be used as a proxy to determine the market size or potential customer base (Kamaşak & Öztürk, 2021); and

(iii) the per capita income and its growth trend help determine whether users can pay for the services offered by the project (UN-OHRLLS, 2020).

**Macroeconomic Policies**

Banerjee et al. (2006), Sharma (2012), Gatti (2013) and Ruiz Díaz (2020), amongst others, have found that macroeconomic and fiscal management policies influence project financing decisions. Rao (2018) suggests that banks are more comfortable lending in economies with a low possibility of a sovereign default or where the debt-to-GDP ratio is low. A low debt-to-GDP ratio also indicates a government's ability to provide project performance guarantees and honour them should the need arise (Lu, Chao, & Sheppard, 2019).

Sovereign credit rating is another factor that affects project financing decisions as it increases the cost of debt and discourages investors (Ramela, 2017). Banks use credit ratings to assess the level of risk of their lending, and institutional investors use them to guide capital allocations to various projects (Iyer & Purkayastha, 2017). In addition, policies related to taxation and the nationalisation of infrastructure assets also influence financing decisions (Gatti, 2013).

**Availability of Capital Market**

The availability of an efficient and well-functioning capital market encourages the private sector to support infrastructure projects (Banerjee et al., 2006). The availability of such a market assists in creating an enabling environment for the private sector to undertake infrastructure projects by providing a variety of financial products and low financing costs (Chan et al., 2010).

**Money Supply**

Yurdakul et al. (2021) found that infrastructure financing is positively affected by money supply as the availability of money makes financing cheaper.

The macroeconomic factors listed above are summarised in Table 2-1 below.

**Table 2-1: Identified macroeconomic factors/ components of the macroeconomic environment**

| Macroeconomic Factor | Reference | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| GDP (size of the economy) | | | | | √ | √ | √ | | | √ | | | | | | | | | | |
| Market size (population) | | | | √ | | √ | | | | √ | | | | | | | √ | | | |
| Income level (per capita) | | | | | | √ | | | | √ | | | | | | | √ | | | |
| Inflation rate | √ | √ | √ | √ | √ | | √ | | | | | | | √ | | | | | | |
| Interest rate | | √ | √ | | | | | | | | | | | √ | | | | | | |
| Exchange rate | | √ | √ | √ | | | √ | | | | | | | √ | | | | | | |
| Govt. debt (debt-to-GDP ratio) | √ | | | | | | | | | | | | | | | | √ | | | √ |
| Money supply | | | | | | | | √ | | | | | | | | | | | | |
| Availability of financial market | | | | | | | | | | | √ | | | | | | | | √ | |
| Quality and stability of fiscal and monetary - policies | | | | | √ | √ | √ | √ | √ | √ | | √ | √ | | | | | | √ | |

| Macroeconomic Factor | Reference | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| Quality of regulatory environment and institutional capacity | | | | | | √ | √ | √ | √ | √ | | √ | √ | | | | | √ | √ | |
| Country credit rating | | | | | | | | | | | | | | √ | √ | √ | | | | |

References: 1- Rao (2018), 2- Yescombe, (2007), 3- Crăciun (2011), 4- Platona et al. (2014), 5- UN-OHRLLS (2020), 6-Kasri & Wibowo (2015), 7- Sharma (2012), 8- Yurdakul (2021), 9- Ruiz Díaz (2020), 10- Banerjee et al.(2006), 11- Hammani et al. (2020), 12- Gatti (2013), 13- Zhu & Chua (2018), 14-Campanella et al.(2018), 15- Ramela (2017), 16- Iyer & Purkayastha (2017), 17- Hammami et al. (2006), 18 - Ahmadabadi & Heravi, (2019), 19- Chan et al., (2010), 20- Lu et al., (2019)

In summary, macroeconomic factors in the context of project financing include not only macroeconomic aspects such as tax rate, inflation and currency exchange rate but also the underlying political factors, policies and regulations that influence those factors. Therefore, to understand the influence of macroeconomic factors, a wide range of factors especially political, policy-related, and regulatory aspects determining the macroeconomic outcome also need to be analysed.

## 2.7 Importance of Macroeconomic Factors in Project Finance

Zhu and Chua (2018) undertook a study to identify critical bankability criteria for PPP projects in China and found that banks and lenders consider the political environment, macroeconomic environment, stakeholders' credibility, and financial market the four most important factors. In a study defining a suitable PPP ecosystem in the European context, Leviäkangas, Kinnunen and Aapaoja (2016) advocated for developing a sound economic environment and financial market to leverage finance for infrastructure development. The importance of economic factors has further been highlighted by Fay, Matrimort and Straub (2021), who nonetheless afforded equal importance to institutional factors such as public sector investment, regulatory capacity and corruption.

Rao's (2018) study on Asian countries revealed the importance of several macroeconomic factors such as inflation and currency stability in project financing. This study found that Asian banks place more importance on macroeconomic factors than on project financial outcomes to make a project financing decision. The author argues that reducing macroeconomic risks would encourage banks to finance infrastructure projects. In a study covering various infrastructure projects in BRICS and PIIGS countries, Campanella, Serino, Nelli and Graziano (2018) found that project finance performance and sustainability are influenced more by macroeconomic factors than other factors.

Phalatse (2021) found that in South Africa, the lack of bankable projects, high macroeconomic risks (debt-to-GDP ratio), and a weak policy environment affect the private sector's participation in infrastructure financing. Therefore, against the backdrop of the importance of macroeconomic factors in influencing project financing

decisions, an attempt was made to understand South Africa's macroeconomic factors that might have an impact on project finance.

## 2.8 Risks in Project Finance

According to Gatti (2013), risks in project finance can be classified into three groups based on the project phases in which those risks manifest. The following section provides an overview of the identified project finance risks.

### 2.8.1 Pre-completion phase risks

Pre-completion phase risks emerge before the start of operation of an infrastructure asset. There are three types of pre-completion phase risks, namely (a) activity planning risks, (b) technological risks, and (c) completion risks. Activity planning risks are caused by poor planning and coordination among stakeholders, resulting in delays. Technological risks arise due to poor choice of technology that is incapable of delivering the desired outcome. Completion risks are associated with delays in completion due to force majeure, budget overrun and/or performance inefficiency.

### 2.8.2 Post-completion phase risks

The post-completion phase risks emerge after the start of an operation of an infrastructure asset and are of three types. First, supply risk occurs when the SPV is unable to source the required production input (in quantity or quality) to operate the infrastructure efficiently. The second type of risk is demand risk which arises when the revenue generated through operating the infrastructure is less than anticipated. The third type of risk is operating or performance risk, which arises when the infrastructure underperforms and is unable to meet the demand.

### 2.8.3 Risks found in both pre-and-post-completion phases

The most common risks that exist in both phases can be classified as being of six types. First, there are risks associated with macroeconomic and financial variables used to assess a project's risk and return. This type of risk refers to any change in the macroeconomic and financial variables that affect the SPV's financial performance and the financiers' return on investment. Examples of these variables

include interest rate, currency exchange rate, tax rate, and inflation rate. The second category of risks is the political and country risks arising from civil unrest and changes in the legislative, political, and social environments. Examples of political and country risks include the nationalisation of infrastructure, restrictions on currency exchange, and social and political movements against the infrastructure. The next category of risks is associated with the environment, which arises when there is public opposition to projects that can cause harm to the environment. There are also risks associated with the project's regulatory framework, such as delays, permits required to start the project not being obtained, or changes or cancellation of the concession agreement governing the project. The next category of risks is legal risks which pertain to the strength and fairness of the host country's legal system and institutions in enforcing the contracts and concession agreements. The final category of risks is credit risks, which refers to the creditworthiness of the SPV and parties involved in the project finance deal structure.

From the above, it can be inferred that risks associated with project finance can arise at any point during the project life cycle. These risks can cause inefficiencies and delays, cause a stoppage or completely shut down a project's development or operational activities. In addition, the risks associated with any changes in macroeconomic variables and the political and regulatory framework responsible for monitoring and controlling those can manifest at any stage of a project. As a result of such an incidence, the SPV and its financiers and sponsors might experience revenue loss. It is, therefore, necessary to identify the risks associated with the macroeconomic environment and how financiers mitigate those risks.

From the perspective of risk profiling, project finance falls somewhere between a corporate investment that merely fulfils the investment requirements for the category and speculative loans (Walter, 2017). Due to the level of risk involved in project finance transactions, risks are allocated to an entity that can handle and mitigate them the best. An incentive accompanies the allocation of any risk to the private sector entities. In some cases, risks are transferred to professional risk management companies or insurers (Gatti, 2013).

## 2.9 Risk Mitigation in Project Finance

As described above, various financing instruments are available for the private sector to invest in infrastructure. Similarly, various risk mitigation instruments are also available to the investors. The following are some of the available risk mitigation instruments.

### 2.9.1 Guarantees

Guarantees are generally provided by the project sponsor or the public sector to protect the creditors and equity investors to cover risks related to minimum revenue (minimum revenue guarantee or MRG), default, refinancing, and exchange rate volatility. MRG and grants help reduce the impact of volatility in cash flow or revenue and exchange rate, which eventually enhance credit quality and ensure cash flows to equity investors (OECD, 2015b). Yescombe (2007) warns, however, that a project relying too much on MGR might attract political risk as the project benefits would diminish and create a moral hazard for the government.

In addition to revenue guarantees, the public sector issues credit guarantees such as full credit guarantees (FCG), partial credit guarantees (PCG), and letters of credit to service debt (interest or principal payments) if the asset is unable to generate enough revenue. FCGs or wrap guarantees cover the entire debt service amount or the debt service of specific tranches in the event of default. PCGs cover a part of the debt service (OECD, 2015b).

Ahmadabadi and Heravi (2019) observe that government guarantee and political support are important for successfully leveraging private finance. In addition, public guarantees help reduce the cost of credit and repayment risk and make a project eligible for investment. However, the guarantor's credit rating plays a key role here as project financing transactions backed by highly rated guarantors are considered less risky and receive better financing terms such as interest rate and financing tenor (Lu, Chao & Sheppard, 2019).

### 2.9.2 Insurance

Insurance is another form of financing risk mitigation tool which is generally provided by private parties. Insurances can cover political and regulatory risks, revenue or business risks, market risks, operational risks, force majeure, sovereign risk, and credit

guarantees on debt instruments. Insurance is useful in mitigating external risks and uncertainties that are difficult to quantify (OECD, 2015).

### 2.9.3 Hedging: Derivative Contracts

Derivatives are generally useful to minimise or negate interest risk exposure, currency fluctuation exposure and plan for long-term future cash flows. Currency derivatives can help reduce currency exposure and are particularly useful if the revenue and liability payment currencies are not the same. Examples of currency derivatives include swaps, forwards, futures, and options. Similarly, credit derivatives can minimise or negate credit risks borne by creditors and debtors. Credit default swap (CDS), a type of credit derivate, can hedge projects bearing credit risks from governments or corporate bodies from the default risk of a counterparty.

## 2.10 South African Macroeconomic Context

South Africa is an upper-middle-income economy with a per capita income of US$5091 (World Bank, 2021a). South Africa's GDP contracted from US$368 billion in 2018 to US$302 billion in 2020 due to the COVID-19 pandemic (World Bank, 2021a). Before the pandemic, South Africa experienced economic stagnation for some years. Though the GDP is projected to grow at 3.0% in 2021, it will slow down to 1.6% in 2022 due to structural challenges. With a Gini index of 63, South Africa is characterised by a high level of income inequality and a high unemployment rate which currently stands at 34.4% (StatsSA, 2021). The pandemic further resulted in extensive job losses and an increase in income inequality (African Development Bank, 2021).

Because South Africa is an upper-middle-income economy, theoretically, people can pay for infrastructure services (such as road use fees/tolls and electricity charges). However, the high levels of income inequality and the unemployment rate might have reduced the actual market size for infrastructure services as many poor, and unemployed people may not be able to pay for those services.

UN-OHRLLS (2020), Kasri and Wibowo (2015), Sharma (2012) and Banerjee et al.(2006) found that size of the economy, income level and market size influence project financing decisions and project sustainability.

Rao (2018), Yescombe (2007), Crăciun (2011), Platona et al. (2014) and UN-OHRLLS (2020) found that low inflation and interest rates and currency stability attract private finance for infrastructure development. South Africa's inflation rate is 4.9% (StatsSA. 2021), and it is expected to stay within the South African Reserve Bank's (SARB) target range of 3% to 6% in the near future (African Development Bank, 2021). South Africa's repo rate and JIBAR are also steady and below 4% (South African Reserve Bank, 2021).

A country's debt level influences its ability to attract private finance for infrastructure development (Rao, 2018; Sharma, 2012). South Africa's debt-to-GDP ratio has been rising over the years and is expected to reach 100% in 2023, which is much higher than the average emerging market ratio (Ramokgopa, 2021).

Some scholars, such as Campanella et al. (2018) and Ramela (2017) consider that sovereign credit rating influences financing decisions. South Africa's current Fitch credit rating is BB- meaning the economy is constrained by high and rising sovereign debt, low economic growth and exceptionally high inequality. Despite the negative impact of the pandemic and poor credit rating, the South African banking and financial sector remains sound, and domestic credit to the private sector increased during the pandemic (African Development Bank, 2021). In addition, South Africa has a well-functioning capital market which is an enabler of private sector financing.

According to Kasri and Wibowo (2015), Sharma (2012), Yurdakul (2021), Ruiz Díaz (2020) and Banerjee et al. (2006), the political, institutional and regulatory environment controlling the macroeconomic factors also influences project financing decisions. South Africa's percentile rank among all countries was 59 in relation to the control of corruption, 50 in the rule of law, 60 in regulatory quality, and 63 in government effectiveness in 2020 (World Bank, 2021b). Hence it can be seen that South Africa has been able to control inflation and interest rates and ranks in the upper half in controlling corruption, regulatory quality and government effectiveness. Simultaneously, the country has a poor credit rating, high debt-GDP ratio and high levels of unemployment and inequality. South Africa's macroeconomic factors thus

create a complex environment for infrastructure investment. With this backdrop, the research sought to identify whether project financiers consider the above factors in making financing decisions and where those factors are considered by finance professionals, which factors they view as being the most important.

## 2.11 Conclusion

Extensive academic literature and practitioner-based journals have identified the importance of infrastructure investment decisions in the development of a country or region and the factors affecting the investment decisions of private financiers. The general motivation of private financiers to invest in infrastructure projects is to receive maximum return while bearing the lowest risk. However, the financing instruments differ along with the risks associated with instruments and the mitigation measures to hedge those risks. Many of those motivations and risks are related to the country's macroeconomic factors. The macroeconomic factors differ between countries and regions.

This research aimed to identify those factors in the South African context as considered by project financiers, assess their importance and how those factors influence financing decisions, as well as the tools that may be employed to leverage private finance for infrastructure development.

# Chapter 3: Research Questions

The research motivation described in Chapter 1 and the literature review conducted in Chapter 2 established the need for identifying the macroeconomic factors influencing project financing decisions in South Africa. Furthermore, it is worth examining how those factors influence project financing decisions by understanding the risks associated with them and the perceptions of financiers regarding those risks.

Research Question 1:

> What are the key macroeconomic factors influencing financing decisions for infrastructure projects in South Africa?

The objective was to understand the primary macroeconomic factors influencing a financier's decision to invest in infrastructure projects in South Africa. Literature suggests that scholars have varying opinions on such factors. In addition, Campanella et al. (2018) and Yurdakul et al. (2021) found that macroeconomic factors influencing project financing decisions differ between locations. Through this question, the researcher sought to identify those factors in South Africa.

Research Question 2:

> How do those factors influence project financing decisions?

This question examined how and to what extent macroeconomic factors influence project financing decisions by understanding the risks associated with project finance, the effect of South Africa's current macroeconomic environment on project financing, and opportunities and challenges created by the environment. This question also examined the impact of the COVID-19 pandemic on project financing decisions.

Research Question 3:

> What measures can be implemented to maximise South Africa's macroeconomic strengths while minimising the risk posed by its weaknesses?

After identifying the macroeconomic factors influencing infrastructure financing decisions, the research examined how the most prevalent factors could be addressed to encourage private financing in infrastructure development. Then, depending on the nature of the identified factors, a matrix can be developed which will leverage the positive aspects and mitigate the unfavourable factors or risks.

# Chapter 4: Research Methodology

## 4.1 Introduction

Chapter 2 provided important insights into the macroeconomic factors affecting infrastructure financing decisions, risks associated with financing and mitigation measures. Based on the identified gaps in the existing knowledge base and industry requirements, research questions were formulated as described in Chapter 3. This chapter discusses the data collection and analysis methodologies employed to address the research questions.

## 4.2 Research Philosophy

As mentioned in Chapter 1, studies focusing specifically on identifying and exploring macroeconomic factors are limited. Campanella et al. (2018) suggest that the factors identified by the existing literature may vary from geography to geography. With the above in mind, this research aimed to identify the macroeconomic factors that influence the private sector to finance infrastructure development by gaining a deeper understanding of the subject. According to Saunders and Lewis (2018), an exploratory research method is suitable when research aims to gain a deeper understanding of a subject or discover new information about the subject. Drawing on this, an exploratory research method was considered suitable for this study.

The goal of the study was to discover which factors private institutional investors, banks, and private equity investors in South Africa consider to be relevant in making infrastructure funding decisions. The study focused on assessing the subjective meaning of those elements as perceived and interpreted by industry professionals and experts. Those elements were viewed from the perspectives of private investors, and every perspective was treated with equal importance. As these are characteristic of the interpretivism research philosophy (Clarke, 2009), the study followed this philosophy.

By observing and evaluating the responses of the interviewees, the research aimed to contribute to the development of theoretical notions on the subject. For the following reasons, the inductive technique was found to be appropriate for attaining

the above goal. First, the inductive technique enables researchers to construct a theoretical framework or develop hypotheses based on their findings (Saunders & Lewis, 2018). Second, the inductive technique enables researchers to observe, experiment, generalize and detect patterns in data before proposing a theory (Ryan, 2018). Hence, the study adopted the inductive approach.

Semi-structured interviews were used to collect qualitative data for the study. The participants were asked to express their thoughts and opinions on macroeconomic issues that influence infrastructure finance decisions. Furthermore, the researcher attempted to better comprehend the situation through the stories and experiences of the interviews, as well as to investigate the significance of the interviewees' experiences (Wang & Geale, 2015). Such a data collection approach is known as narrative inquiry (Sanders & Lewis, 2018).

The study collected only qualitative information through semi-structured interviews. Hence, the study adopted the mono method (Saunders & Lewis, 2018). Regarding the time horizon of the study, it can be classified as a cross-sectional study. Cross-sectional research involves gathering information from multiple people at a particular time (Saunders & Lewis, 2018). The researcher wanted to explore the research participants' views on the macroeconomic factors affecting their financing decisions only once without tracking whether their views may have changed after a particular period.

## 4.3 Research Methodology

### 4.3.1 Population

The population can be defined as the possible collection of all possible data values or the complete set of group members (Saunders & Lewis, 2018) that exist for the random variables being studied. The literature review chapter described the types of private sector financiers involved in infrastructure projects, namely private equity investors, mezzanine debt financiers and debt financiers. The professionals and experts involved in providing equity, mezzanine and debt financing were therefore

considered the population of the study. The extent of this study was limited to individuals with work experience in the South African project finance milieu.

### 4.3.2 Unit of analysis

For this study, the interviews were considered as the unit of analysis. To analyse the acquired data, the responses received in those interviews were broken down into components.

### 4.3.3 Sampling method and size

It is necessary to select samples from a diverse group to acquire a comprehensive understanding of the research topic. The study attempted to interview professionals from three different groups: debt financiers, mezzanine financiers, and equity investors to ensure diversity. The research initially aimed to interview at least five professionals from each group or a total of 15 professionals. Hence, a quota sampling technique was adopted (Saunders & Lewis, 2018).

The researcher identified respondents from each population group who have at least five years of professional experience in the relevant disciplines in the South African setting. For example, the interviewees representing banks must have experience in project finance. A professional with retail banking experience was ruled out as a possible candidate. This guaranteed that the interviews yielded useful and relevant information. Persons who were likely to have the requisite expertise and knowledge about the research issue were chosen in the study; hence this sampling methodology may be characterized as purposive sampling (Palinkas et al., 2015).

The researcher identified five professionals working in the mezzanine finance sector and four of the professionals agreed to participate in the study. The researcher addressed the gap by interviewing more debt and equity professionals. Though the initial target was to conduct 15 interviews, the researcher conducted a total of 13 interviews. The total number of samples was further reduced to 12 as a participant did not provide written consent to be part of the study and their responses were thus not included in the study (see Appendix 2). The reduction in the sample did not affect the quality as it was realised that no new theme or topic was emerging by the 11$^{th}$ interview. In addition to those 12 interviews, a participant provided consent but could not attend the interview due to some exigencies. The participant, however, provided

detailed written responses to a set of questions derived from the interview guide. This participant's responses were not used in the study as they were not collected through an interview. The following is the list of interviewees whose responses were included for further study.

**Table 4-1: List of interviewees/ respondents (in alphabetical order)**

| Sl No | Name | Organisation | Domain |
|---|---|---|---|
| 1 | Aadil Cajee | Standard Bank | Debt Finance |
| 2 | Daniel Zinman | RMB | Debt Finance |
| 3 | David Calaca | Pembani- Remgro Investment Managers | Equity Finance |
| 4 | George Kotsovos | Standard Bank | Debt Finance |
| 5 | Hendrick Snyman | Gaia Fund Managers | Equity Finance |
| 6 | Jerry Chiang | Standard Bank | Debt Finance |
| 7 | Kwabena Malgas | RMB | Equity Finance |
| 8 | Li Yuan Zhang | (Advised not to disclose) | Debt Finance |
| 9 | Muhammed Munshi | Stanlib | Equity Finance |
| 10 | Nitesh Roopa | NedBank | Mezzanine/ Quasi-equity |
| 11 | Thulani Shange | ABSA | Debt Finance |
| 12 | Zak Ferreira | NedBank | Debt Finance |

An initial group of respondents was identified from the researcher's personal and professional network. From this initial set of interviews, the snowball sampling technique was used to find more respondents from each subgroup. In snowball sampling or chain referral sampling, research participants assist researchers in identifying other potential research participants (Abubakar, Etikan, & Alkassim, 2016).

## 4.4 Data Gathering Process and Measurement Instrument

For data collection, the study used semi-structured interviews. Before commencing the interview phase, the researcher constructed a list of interview questions based

on the research purpose. The questions were examined by a person with a similar academic interest. After assessing and incorporating the opinions of the reviewer, the questions were finalised. Before conducting real interviews, the researcher did a pilot interview which assisted in process improvement and greater efficiency.

The researcher gathered data through semi-structured interviews. In semi-structured interviews, researchers guide the discussions in the form of conversations based on a set of questions to gather the information that sufficiently covers both breadth and depth of the research topic (Rubin & Rubin (2005) as cited in Francis, 2019).

The interviews were organic, although they were directed by a list of pre-determined questions. This guaranteed that the interview goals were met while also garnering new information. The first survey was done with the help of the interview guide as provided in Appendix 1. In subsequent interviews, the researcher adjusted some of the questions and asked new questions while remaining aligned to the original set of questions in order to elicit additional information, explore the research objectives and gain additional insights (Saunders & Lewis, 2018).

The duration of the interviews varied from 30 minutes to one hour. To avoid physical contact and comply with COVID-19 safety rules, these interviews were conducted online. Each interviewee was reached out at least a week before the interview to evaluate their desire to participate in the study and schedule a convenient time. In addition, the research background and informed consent letter were supplied to each participant via email.

At the beginning of each interview, the researcher gave a formal introduction, a summary of the research and its objectives. Most of the interviews were conducted through MS-Teams, and two interviews were conducted telephonically. Barring two, all interviewees provided consent to record the meetings. The researcher made handwritten notes for those two interviews. The handwritten notes were later converted into MS word documents. The video recordings were converted into MS-Word format using an Artificial Intelligence (AI) enabled software. The MS-Word notes were used for further analysis.

After each interview, the researcher looked over the responses to assess whether the data acquired was appropriate and relevant. If it was discovered that interviews

were unable to collect the necessary information, the survey questions were changed to fulfil the research goal.

## 4.5 Analysis Approach

The information gathered through semi-structured interviews was mostly unstructured. The information was analysed using a thematic method. The following process was utilised to analyse the information (Braun & Clarke, 2006).

i. Data familiarisation: The first step towards data analysis was becoming familiar with the data by reading it multiple times and taking notes.

ii. Initial data coding: In this step, data were coded by highlighting keywords and phrases in interview responses. These codes simply labelled data aspects that were of interest. The study generated 177 unique codes, and the codes are provided in Appendix 3.

iii. Theme creation: Similar words and phrases (codes) were put together to convey themes in this step.

iv. Theme review: This process involved determining whether the developed themes accurately reflected the data and developing a thematic map for further research.

v. Defining and naming themes: Themes and their narratives were refined through an iterative method.

vi. Report writing: Following the methods outlined above, the themes revealed certain patterns and repeats. This step entailed looking into the patterns, coming to significant conclusions, and writing narrative descriptions.

The data acquired from the interviews were organized and analysed by the researcher using AtlasTi. It became easier to analyse the data acquired because of the software programme was able to save, sort, search and retrieve information.

## 4.6 Data Storage

The research data has been and will be stored on a password-protected cloud for at least ten years after conducting the study. The cloud-based data storage solution has two benefits: (a) the data will be secured in the event of computer or storage device theft or damage, and (b) the data can be accessed anytime from anywhere in the world.

## 4.7 Quality Controls

A checklist was used to guarantee that the necessary data was obtained, as well as to ensure that the basic questions were answered. To ensure that every conversation point could be accessible later, the researcher recorded written notes and audio/video recordings of the interviews. Every interview was fully documented, including the names of the respondents, their roles and organizations, as well as the date and time of the interview. To guarantee that every discussion point was thoroughly captured, the audio and video recordings were converted to text format and compared with written notes.

Context sensitivity, devotion to the study, transparency and coherence, and impact and importance all contributed to the overall quality of the research (Yardley, 2000). To have a better understanding of the situation, the researcher reviewed past relevant research and academic articles. The researcher engaged closely with the topic, and the participants completed a comprehensive data collection exercise and undertook a rigorous analysis of the collected data. The researcher maintained a coherent and transparent link between how the data was analysed and the conclusions are drawn. The researcher clearly articulated the importance of both the theoretical and practical findings from the study. The importance and impact of the study were kept in mind by relating the particulars of the study to general principles (Klein & Myers, 1999).

## 4.8 Limitations of the Research

The type of response received in the interviews was the study's first limitation. The study relied on the interviewees' perspectives and opinions, and their perspectives and opinions could skew the findings. Second, the study obtained information from a small group of specialists. Because of the limited sample size, the true macroeconomic determinants affecting infrastructure financing in South Africa may not be shown. Third, because of the qualitative and cross-sectional nature of the study, which involves subjective data collection via interviews, this research cannot be repeated because respondents are unlikely to provide the same information at a different time.

## 4.9 Summary and Conclusion

The researcher adopted a qualitative cross-sectional study to understand the views of private sector financiers on the macroeconomic factors affecting infrastructure financing. The research population consisted of experienced professionals from organisations engaged in debt, equity, and mezzanine financing in infrastructure projects. The research sample was carefully selected to ensure representation from all types of financiers and the participation of experienced professionals in the study. Semi-structured and in-depth interviews, loosely guided by a set of questions, were conducted with the respondents to elicit the required information from the interviews. The interview results were then analysed using AtlasTi software. In the analysis process, codes were generated and grouped under relevant themes to identify patterns in the data. Though the interviews provided a sound understanding of the subject matter, the respondents' biases and experiences could affect the quality and reliability of the data generated.

# Chapter 5: Results

## 5.1 Introduction

This chapter presents the results of the semi-structured interviews conducted with infrastructure finance professionals. These interviews aimed to understand the opinions of the infrastructure professionals with regard to macroeconomic factors affecting infrastructure project financing decisions. This chapter also draws some observations from the information collected through the interviews.

As indicated in the previous chapter, a qualitative research method involving a thematic analysis technique was used to identify patterns in the interview responses and the insights that may inform them. The analysis involved identifying keywords and responses within the interview responses and coding them. The codes were then examined to ensure the appropriateness and relevancy of the codes, and some of the codes were either deleted or modified. The list of codes is provided in Appendix 3. The frequencies of each code for every discussion point were also recorded. The following section provides an overview of the responses and most frequently used codes.

## 5.2 Research Question 1

**What are the key macroeconomic factors influencing financing decisions for infrastructure projects in South Africa?**

Through the question, the researcher wanted to identify the primary macroeconomic factors influencing a financier's decision to invest in infrastructure projects in South Africa. Literature suggests that scholars have varying opinions on such factors. In addition, Campanella et al. (2018) and Yurdakul et al. (2021) found that macroeconomic factors influencing project financing decisions vary from geography to geography. Through this question, the researcher aimed to identify the factors applicable to the South African context.

### 5.2.1 Key challenges associated with infrastructure investment

The researcher intended to understand the key challenges associated with infrastructure investment in general and observe how frequent macroeconomic factors are considered key challenges. The interviewees were requested to list the challenges associated with infrastructure investment in South Africa and other countries. Table 5-1 below lists the most frequently mentioned challenges by the respondents.

**Table 5-1: Key challenges associated with infrastructure investment**

| Description | Frequency |
|---|---|
| Inefficient regulatory environment | 14 |
| Unstable political environment | 8 |
| Lack of market demand | 5 |
| Lack of bankable projects | 5 |
| Currency convertibility | 5 |
| Lack of government guarantee | 3 |
| Lack of long-term planning/vision | 3 |

According to the respondents, there are several factors that discourage investors from investing in infrastructure projects. A research participant highlighted the need for the right regulatory and political environments for infrastructure investment:

> *"I think the right regulatory environment as it provides a good foundation in ensuring that infrastructure happens. Sound political environment and will also contribute successfully to infrastructure investment. Because ultimately, political will, political environment, and regulatory environment drive policy."*

A participant reinforced the requirement of the right regulatory environment, transparency in dealings, and commitment to enforce a set of regulations:

> *"The key challenge in the African landscape is regulatory transparency and commitment to a set of regulations to enforce private infrastructure development."*

Some participants pointed out the lack of long-term planning, lack of bankable projects, issues with currency conversion, and poor government resource base to provide performance guarantees. One participant mentioned the need for developing bankable projects and having a long-term vision for infrastructure development and highlighted the difference in the definition of project bankability between the government and the market. This participant observed that:

> *"… we generally lack good long term planning frameworks on the continent for infrastructure development… we are particularly bad at project preparation and project planning… We don't see many projects either ever come to fruition or come to market, because there are wide differences between, you know, sovereigns' definition of bankability and the market's definition of bankability."*

To give an example of a long-term vision, a participant highlighted the government's procurement process. The procurement process does not provide a clear indication of projects that would be developed. This participant pronounced:

> *"… one of the other big challenges in infrastructure is the stop-start mentality in terms of whether its going to be public-private partnerships, or whether its going to be driven primarily by government… there was constant procurement every couple of years. And then there was a stalemate for a couple of years."*

Respondents were asked whether they prefer greenfield or brownfield projects. The researcher wanted to understand whether the investors hesitate to invest in new or greenfield infrastructure projects. Responses to this question were mixed where some preferred greenfield and others preferred brownfield, while some respondents expressed no preference for either as long as the project outcomes suit their criteria. However, a clear distinction in thinking between debt financiers and equity investors was found. Most debt financiers or commercial banks have no preferences, but equity investors prefer brownfield assets. Table 5-2 below shows project-type preference per type of investor.

**Table 5-2: Preference for brownfield or greenfield projects (number of responses)**

| Financier Type | Greenfield | Brownfield | No preference (depends on risk and return) |
|---|---|---|---|
| Debt | 2 | 1 | 4 |
| Equity | 1 | 3 | |
| Mezzanine / quasi-equity | | | 1 |
| Total | 3 | 4 | 5 |

In response to the research question, a debt financier mentioned that there was no preference, but they consider in the future more greenfield projects will come to the market due to the ESG requirements. The participant stated:

> *"I don't think we have a preference. You know, we would look at a greenfield project as often as we look at a brownfield project. At the same time, you know, I think more and more greenfield projects are expected to come to market on the basis that the trend is obviously got a lot more focus on, you know, ESG elements and climate change considerations."*

A participant representing a commercial bank mentioned their preference for greenfield projects:

> *"I think preference will always be in greenfield. There is always a lot more interest in it for the lenders and investors."*

However, equity investors showed a preference for brownfield projects to avoid the construction and development period wherein their investments do not generate any return. A participant representing an equity investment organisation mentioned:

> *"Our focus is on brownfield. That is because we saw the greenfield spaces as quite congested at the moment. Also, within the greenfield space, it takes time to develop a project, that can be five, six to 10 years and to recycle, and your capital does not show a profit."*

An equity investor highlighted the comparatively low risk associated with brownfield projects which motivates them to invest in brownfield projects:

*"… with brownfield projects, sometimes you think its easier because you've already got an asset."*

However, there were equity investor participants who invested only in greenfield projects, but most of the equity investors preferred brownfield projects.

### 5.2.2 Important macroeconomic factors

Through this question, the researcher wanted to understand which macroeconomic factors are considered important by financiers. The interviewees were requested to list macroeconomic factors they consider important when deciding on an investment. Some of the main considerations indicated by the respondents are inflation, currency convertibility, exchange rate, interest rate, and people's affordability (income or GDP per capita). Respondents also mentioned sovereign credibility (credit rating) and government ability to provide guarantees. Many participants consider the debt-to-GDP ratio to be a good measure of the government's financial strength and ability to provide a guarantee. In addition to the above, many respondents mentioned the regulatory environment, political environment, and availability of political and commercial risk insurance as important macroeconomic factors.

It is pertinent to note that a few respondents, all representing debt financiers or commercial banks, do not consider macroeconomic factors important and instead place more importance on the regulatory environment, market demand, the credibility of the off-taker and counterparty to decide on whether to finance a project. To give an example, a debt finance professional explained:

*"I don't think we look at any macroeconomic variables. ...we look at an opportunity and the need that its trying to address. We will understand the regulatory environment within that opportunity."*

Similarly, a participant representing a debt financing organisation mentioned:

*"… macroeconomic factors are not the decision for us… our decision depends on a number of other issues: whether the country has got a need for the assets that are developing, how is it going to get paid for? If you look at one of them in isolation, if you had to say, well, GDP growth is low, it doesn't mean, we're not going to do a deal."*

However, some debt financiers highlighted the importance of macroeconomic factors with one participant specifically noting the importance of debt-to-GDP ratio, which shows the financial health of the sovereign and its ability to provide guarantees:

> *"… a key consideration is definitely the debt-to-GDP ratio, it is equivalent of a balance sheet health check that we do."*

A debt financier pointed out the requirement of stable currency exchange rates and the mitigation measures to prevent losses from currency fluctuations by stating:

> *"… funding projects outside of South Africa as a South African bank, we will provide dollar-based funding into the rest of Africa. We would like to have offtake agreements that are based in the same currency that the loan is to prevent currency fluctuations."*

On the other hand, equity investors look at a range of macroeconomic factors to make investment decisions. These factors include political environment, regulatory environment, interest rates, exchange rate fluctuations, credit ratings, inflation, and GDP growth. For example, a participant mentioned:

> *"I'd say political environment is a big one…tax comes into the mix. Inflation also comes into the mix… They also affect the interest rates and sovereign ratings"*

A participant highlighted the importance of inflation by saying, " *the biggest one in our space is inflation".* A few participants mentioned that there is no single set of macroeconomic variables applicable to all projects. To justify this point, the following example was provided:

> *"Its important to understand, how the machine works and what the input and output factors are. …We have an investment in the toll road where the model inputs to forecast traffic, you have to look at GDP growth, you have to look at the oil price. And you have to look at the per capita income to see how you know how much how much its explainable. And then you also look at mining commodity prices."*

Table 5-3 below lists the most frequently mentioned macroeconomic factors by the respondents, noting that many of the important factors considered important do not fit the definition of macroeconomic factors.

**Table 5-3: Key macroeconomic factors**

| Description (Code or Group) | Number of References |
|---|---|
| Currency and exchange rate | 21 |
| Guarantee and insurance | 15 |
| Inflation | 15 |
| Regulatory environment | 14 |
| Sovereign credibility (credit rating) | 11 |
| Market demand and revenue line | 8 |
| Off-taker agreement | 6 |
| People's affordability | 6 |
| Counterparty credibility | 5 |
| Interest rate | 5 |
| Political environment | 5 |
| Debt-to-GDP ratio | 4 |
| Macroeconomic factors not important | 4 |
| GDP growth | 3 |

### 5.2.3 Sector-specific macroeconomic factors

A follow-up to the previous question was to understand whether the abovementioned factors vary from sector to sector. The intention behind asking these questions was to understand whether the financiers use a set of criteria for all infrastructure sectors such as transportation, energy and water or whether the criteria differ based on the sector and what factors motivate the use of different sets of criteria.

The responses from the participants were mixed. Some participants indicated that the macroeconomic factors do not vary from sector to sector:

> *"Probably not, in project finances, the framework is universal. But I think the forms of security that one would want is different."*

Other participants mentioned that the factors vary from sector and sector, sometimes within a sector. One participant stated the following:

> *"Yeah, [those factors vary] even within the same sector. Its very rarely a one size fits all."*

A follow-up to the above question related to whether the financiers prefer any particular sector. The motivation was to understand which sectors are preferred by the financiers and their reasons, and specifically to understand the macroeconomic factors that motivate financiers to focus on one or more sectors. Most of the respondents mentioned that they do not have a preferred sector as long as the project's risk and the return match their expectations, as one participant explained:

> *"any sector, as long as the fundamentals are good, because banks are looking for banking opportunities "*

A participant supported the above point and clarified what is typically looked for in a sector, i.e. which can generate long term predictable cashflow. This participant observed:

> *"I wouldn't say we have a preferred or undesirable sector. We like those infrastructure projects, where there's a long dated, predictable set of cash flows, low volatility, monopolistic type characteristics, so its kind of a sweet spot. And you can find it in different forms, renewable energy, digital infrastructure."*

However, it was noted that most of the respondents are currently engaged in the energy sector, specifically renewable energy. The reason for this is that there has been a flow of projects and the sector would likely receive support from the government before any other sector receives it. Hence, the level of risk is comparably low in the power sector. In the words of a respondent:

> *"… we prefer power, because we see power as very critical to the South African economy, ...also in the event that you've got some form of cover from government, they'll probably let SAA (South African Airlines) collapse before they let ESKOM collapse. So, you are very high up in the pecking order."*

### 5.2.4 Macroeconomic factors relevant in South Africa

Through this question, the researcher wanted to understand which macroeconomic factors are considered relevant in South Africa by financiers. The interviewees were requested to identify macroeconomic factors they consider important for the South African context from the list of macroeconomic factors already identified earlier in the discussion.

Most of the respondents consider that their perspective on South African macroeconomic factors does not vary much from their opinion on the general macroeconomic considerations for a project financing decision. Some of the main considerations indicated by the respondents are inflation, regulatory environment, exchange rate, interest rate, and people's affordability to pay for services (income or GDP per capita). Respondents also mentioned that they look at the local content requirements in every project and South Africa's ability to fulfil those requirements. Many participants consider sovereign credibility (credit rating) and government ability to provide guarantees, debt-to-GDP ratio are important macroeconomic factors in South Africa. In response to an earlier question, a few respondents mentioned that they do not consider macroeconomic factors as important for making project financing decisions. They prefer to place more importance on the regulatory environment, the credibility of the off-taker and counterparty to decide whether to finance a project. It was assumed that their response to the current question would be the same as they do not consider macroeconomic factors are not important in infrastructure investment decision-making.

While some debt financing professionals stated that earlier macroeconomic factors do not matter much in project financing decisions, some differed with this point of view. The latter group of financiers consider that the government's fiscal deficit, which would impact on its ability to provide guarantees, credit rating, inflation, currency volatility, and the ability of local manufacturing units to meet local content requirements, are some of the key macroeconomic factors. For example, a participant noted the following to express their concern about the government's fiscal deficit and credit rating:

> *"In South Africa a lot of large-scale infrastructures are driven by the sovereign. At the same time, the sovereign is under increasing pressure regarding how*

*much guarantees it can give out. Where does the overall kind of credit rating sit and the cost of the debt that goes with that?"*

A participant highlighted the local content requirements attached to infrastructure projects, risk insurance availability and its cost, and currency volatility, and explained:

*"We would look at risk insurance, be it either political risk insurance or commercial risk insurance. We also look at the local content requirements (and capacity of local manufacturing base), currency volatility, and security structure."*

Equity investors have different points of view on the relevant macroeconomic factors. First, all of them think macroeconomic factors are important; second, they consider a wider range of macroeconomic factors to decide on relevant macroeconomic factors. For example, a participant mentioned:

*"… pretty much all of them (macroeconomic factors identified earlier: government's financial strength and ability to provide a guarantee, regulatory environment, political environment, credit rating, people's affordability) are important".*

They further emphasised the importance of exchange rate stability as many projects are financed through US $ based funds. In addition, they also consider inflation and interest rate are important factors. The following quote by an equity investment professional attests to the above finding:

*"Interest rates and CPI are quite important in South Africa... foreign exchange is key in construction because the EPC contractors, construction companies will generally price a number of the contracts in a foreign currency, or some of the components that have been acquired, will be acquired from overseas suppliers."*

Table 5-4 below lists the most frequently mentioned macroeconomic factors for the South African context by the respondents.

**Table 5-4: Key macroeconomic factors in the South African Context**

| Description/Construct (Code or Group) | Number of References |
|---|---|
| Inflation | 18 |
| Regulatory environment | 13 |
| Political environment | 9 |
| Currency exchange rate | 8 |
| Guarantee and risk insurance | 5 |
| Local content requirements (ability of local manufacturing units to fulfil the requirements) | 5 |
| People's affordability | 5 |
| Interest rate | 4 |
| Macroeconomic factors not important | 4 |
| Demand & revenue stream | 3 |
| Debt-to-GDP ratio | 3 |
| Job creation | 3 |
| Off-taker agreement | 3 |
| Credit rating / sovereign credibility | 2 |
| GDP growth | 2 |
| Long term vision | 2 |

## 5.3 Research Question 2

**How do those factors influence project finance decisions?**

This question aimed to understand how and to what extent macroeconomic factors influence project financing decisions. This question also examined the perception of the financiers regarding South Africa's current macroeconomic outlook in terms of opportunities and challenges presented by it and the impact of COVID-19 on project financing.

### 5.3.1 Investment risks with the macroeconomic factors

The researcher wanted to explore the investment risks associated with the identified macroeconomic factors in terms of how they affect infrastructure financing decisions.

With regard to the risks associated with the macroeconomic factors, a respondent indicated that currency fluctuation is a high risk for them as any material depreciation in ZAR will have a significant impact on the project profitability. The following is a quote from the respondent:

> *"All projects in SA are ZAR denominated investments. If the ZAR depreciates against the USD, then the USD returns are lower. We do not hedge for ZAR/USD movements as it is too expensive".*

Another respondent highlighted that inflation, foreign exchange rates and interest rates are important as these three factors can make a difference in the project value of an investment and the actual value received after the investment period. The respondent explained:

> *"CPI can affect your revenue. If you invested in a project with a particular CPI assumption, and if the market moves subsequent to that higher or lower, that impacts the value. So you'd be selling it at a lower or higher value, the same goes with interest rates, in FX rates… a lot of investors might have to value the investments on an ongoing basis…So your value of the investment may go up or down."*

A respondent stated: *"general red tape is a huge risk… tax is also big one".* This respondent considers that government processes and in particular lengthy bureaucratic processes are a central risk associated with infrastructure investment. A long bureaucratic process leads to delays in procurement and construction, which eventually leads to cost escalation. The respondent also mentioned that the tax rate was another risk they had to deal with.

Many respondents highlighted the risks associated with other factors such as construction challenges, market demand, off-taker's ability to operate the infrastructure, political, operations and social. One of the respondents commented on this issue:

> *"… the biggest risk early on is the construction, to say, can you construct this project with this amount within this time? ... Then if there is any legal or regulatory change, it can also pose a problem, because think about it. Let's*

*say you get a PPA (power purchasing agreement) for 20 years with Eskom. But after few years Eskom says we don't want to buy your power anymore."*

Another respondent reiterated the risks associated with the development and operating of infrastructure assets and observed:

*"… there's a number of issues that you have to consider… there is construction risk, there is operational risk."*

The risks associated with the credibility of the off-taker, market demand and political stability were highlighted by many respondents, as observed below:

*"… its mostly around the ability of the off-taker risk and the market risk... one of the biggest factors is political risk or political stability."*

Table 5-5 below lists the various risks and uncertainties associated with infrastructure project financing as noted by the respondents. It can be observed that many of the risks are not related to the identified macroeconomic factors affecting project financing decisions.

**Table 5-5: Risks associated with infrastructure project financing**

| Description/Construct (Code or Group) | Number of References |
|---|---|
| Construction risk | 8 |
| Exchange rate | 5 |
| Inflation | 5 |
| Off-taker's credibility | 5 |
| Law and regulations uncertainty | 4 |
| Political uncertainty | 4 |
| Government's financial status (debt-to-GDP ratio) | 3 |
| Interest rate | 3 |
| Operational risk | 2 |
| Red tape / lengthy bureaucratic process | 2 |
| Technological risk | 2 |
| Commercial and market demand risk | 2 |
| Community risk | 1 |
| Drop in project performance | 1 |

| Description/Construct (Code or Group) | Number of References |
|---|---|
| Environmental risk | 1 |
| No/low risk in South Africa | 1 |
| Safety and security of the project | 1 |
| Tax rate | 1 |

### 5.3.2 Nature of investment risks

The researcher wanted to understand the nature of the identified risks by assessing when those risks manifest and how financiers mitigate those risks. The previous question revealed that most financiers consider construction, political, and commercial risks as the most critical risks associated with infrastructure investment. This question probed further when those risks manifest and how they mitigate them.

All respondents consider the identified risks could manifest from the onset of the projects. For example, a respondent stated, "*they manifest from, I would imagine, sort of day one".* Another respondent mentioned, "*We'll look at all these risks from the beginning… you have to identify the risk from the beginning and then monitor".*

While probing into mitigation measures, a variety of opinions came to the fore. Some respondents stated they take these risks as long as they can bear them; beyond that, they either transfer the risks to the parties who are better equipped to handle them or purchase risk insurance. Finally, they decline projects for financing if the project is too risky for them. This point of view can be seen in the following statement of a respondent:

> *"We accept risk in projects. I think there's a kind of inflexion point where the risk would become too high. And we would decline projects. That said, if one cannot mitigate the risk through something, like political risk insurance, or commercial risk insurance ...if you can't be insured, then we will make a decision not to pursue it."*

In order to manage macroeconomic risks while developing the financial model for a project, debt financiers undertake sensitivity tests to see how the project performs under various uncertain macroeconomic environments and structures the financing

terms accordingly. The following statement describes the perspective of a respondent:

> *"Those (macroeconomic factors) are part of the sensitivity test. We develop a very good financial model. Our sensitivity test evaluates the impact of inflation and exchange rate fluctuations."*

A respondent highlighted the importance of risk-sharing and allocation in project financing and explained that: "… *project financing is about looking at all of the risks and allocating the risks to that entity that is best place to manage them".* Another respondent supported the above point by placing importance on risk structuring: "… *project finance transaction people hardly ever lose money if its structured correctly. Normally, what happens is just restructuring."*

While debt financers were found to be comfortable in taking risks, equity investors tried to avoid risks, specifically construction and development risks, as much as they could. However, as was the nature of their investment, they take operational and market risks and mitigate these risks by employing a strong off-taker and selling the infrastructure asset's services at floating rates linked with interest and inflation rates.

Table 5-6 below lists the various risks mitigation measures as mentioned by the respondents. It can be observed that many of the identified risks are not related to the identified macroeconomic factors affecting project financing decisions.

**Table 5-6: Risks mitigation strategies**

| Description/Construct (Code or Group) | Number of References |
|---|---|
| Conservative financial forecasts to cover adversities (for CPI, exchange rate, tax rate) | 7 |
| Strong offtake agreement | 4 |
| Avoid construction risks | 3 |
| Contractor's performance guarantee | 3 |
| Effective risk allocation | 3 |
| Avoid new technologies | 2 |
| Commercial risk insurance | 2 |
| Continuous risk monitoring | 2 |

| Description/Construct (Code or Group) | Number of References |
|---|---|
| Employing experienced O&M contractors | 2 |
| Engaging credible contractors | 2 |
| Employing experts / technical advisors | 1 |
| Political risk insurance | 1 |

### 5.3.3 Investment exit strategy

This question is intended to understand whether the investors have any strategy to exit from their investments if the project outcomes do not meet their requirements due to changes in the macroeconomic factors. There were mixed responses regarding whether they considered any particular investment strategy. Some respondents generally mention that they do not have any exit strategies as they aim to stay in the project throughout the duration of the deals and solve any problems that may arise. A respondent observed:

> *" …we don't necessarily have exit strategies. I mean, what we do is make sure we package the project well. So that if something does go wrong, we can sort it out that we've got the requisite, you know, security to make sure that you can rectify a problem. So, if there's a construction issue, it is then up to the contractor to basically rectify the problem. So, if they haven't done the works, as they should have, you'll call the bond, you'll call the corporate guarantee, you may even step in and appoint another contractor to finish the work."*

Similarly, a respondent explained that there is no exit strategy, and they try to rectify the problems as they manifest. However, they consider exiting from an investment if the problem cannot be rectified after trying all possible ways to rectify it. The exit strategy depends on the nature of the problem. The following statement describes the respondent's viewpoint:

> *"I don't think you can have an exit strategy… we always try and find a way to find a solution and try and navigate through the problem. And obviously once trying to layer solutions onto the problems and once every solution you've exhausted, that doesn't essentially resolve the problem, you then obviously*

*need to try and figure out if you need to make final exit strategy out of that asset. But that exit strategy could look completely different for every asset."*

In order to address problems, a range of steps is taken based on the nature of the problem or challenge. Some of the steps include appointing technical advisors, appointing additional contractors, or replacing existing contractors. If they are unable to solve the problems, they use performance bonds, insurances and government guarantees to cover their losses as a last resort. The following statement of a debt finance professional illustrates the above proposition:

*"We have extensive legal agreements and project agreements that get signed on this. And one would start getting law firms involved to see what legal recourse we as a lender would have if anything went wrong. And then, I mean, if there's no way of legally solving the problem, we would look to using the insurance that we have."*

Some respondents mentioned that they have an exit strategy. The exit strategy is always complex and based on the asset. For example, a respondent clarified:

*"There is always some sort of exit strategy that is structured into the transaction, it is not always necessarily a case of, you know, calling on a government guarantee or calling on equity. (It is) not always a simple exit."*

This was supported by a respondent who considers it is quite complex to exit from an investment due to the involvement of the government as the statement below explains:

*"The way they (project finance deals) are structured, it doesn't allow for quick exit because typically, you have kind of finances in a project that you genuinely need consent from a governmental department. So, it's quite difficult."*

### 5.3.4 South Africa's current macroeconomic environment affecting financing decisions

The objective of this discussion was to understand how South Africa's current macroeconomic environment affects project financing decisions. Respondents representing commercial banks generally agreed that the current macroeconomic environment, especially the credit rating, affects project finance as it increases the cost of capital. A respondent explained:

> *"… credit rating has severe influence. I mean, it affects the cost of capital. And other factors, they do not affect that much."*

A respondent, while supporting the above argument, mentioned that in renewable energy the cost of capital has not increased despite downgrades due to the increasing competition among the banks to finance such projects. This respondent's argument is provided below:

> *"Credit rating of the government has impacted the cost of debt as a good credit rating translates attracts a low price of the debt. However, recently the opposite happened with the renewable energy program. There is a lot of interest and competition amongst the banks to become part of this program. So, banks have actually lowered their margins to win projects."*

Most of the debt financers consider that apart from the debt-to-GDP ratio South Africa's current environment does not significantly affect their financing decisions. The changes in the ZAR-USD exchange have little implication as most banks have financial centres in London that provide hard currency funding. Other macroeconomic factors such as interest rate and inflation are indexed with the JIBAR, hence any change in those factors will not influence banks' lending rates. For example, a respondent explained:

> *" …most of the South African banks have offices in London as well. So they would provide their dollar based funding from London. So, in that sense, you keep your hard currency in a less volatile market. With our Rand investing within South Africa, we're quite comfortable with the market, especially in energy, the volatility, you know, that was brought on by COVID on the JIBAR rate, for example. And CPI is expected to work itself out within the next 12*

*months and get to levels back to pre-COVID. So usually, we have our clients hedge their interest rates for the long term."*

The responses from the equity investors were mixed. Similar to debt financiers, some equity investment professionals expressed concern about the rising debt-to-GDP ratio and credit rating as they indicate the government's ability to honour contractual obligations and guarantees. As a result, many investors ask for additional credit enhancement from governments or consider buying risk insurance. The following statement of a respondent describes the above argument:

*"… it is getting trickier to deal with governments. Its something you got to keep watching at the moment, having a government guarantee is still viewed quite positively. But as time goes by, and that the debt ratio creeps up, it may be that you then start asking for additional credit enhancement from governments in order to enter into long term agreements with them."*

A respondent expressed concern about the current high yield rate of government bonds which give similar returns but are more liquid and risk-free. As a result, equity investment becomes less attractive. The respondent explained:

*"A government bond is yielding 12%. You know, how do you justify investing in an infrastructure project yielding 12%? Its a tough decision because the government bond is liquid. There's no operational risk."*

A respondent further highlighted the issue of the high unemployment rate that could result in crime, creating a less investment-friendly environment, noting that:

*"… because of high unemployment, there probably is going to be a high level of crime.. that normally would drive away investors."*

According to one respondent, due to the current macroeconomic environment characterised by slow GDP growth and high unemployment rate, some are investing only that amount that must be invested in South Africa by regulation.

*"I think its worrying. Investors have the requirement under regulation 28 that a certain amount of money has to be spent in South Africa, they've got no other choice."*

Despite that, according to another respondent, there is no liquidity issue in the country at this point in time. The respondent explained:

*"there's been so much liquidity sloshing in the market in the last few years"*

Table 5-7 below lists the characteristics or factors of the current macroeconomic environment affecting project financing decisions.

**Table 5-7: Characteristics of the current macroeconomic environment**

| Description/Construct (Code or Group) | Number of References |
|---|---|
| High debt-to-GDP ratio | 7 |
| Poor credit rating | 7 |
| Exchange rate | 4 |
| High unemployment rate | 4 |
| Positive reforms | 2 |
| Privatisation initiatives | 2 |
| Enough liquidity | 1 |
| High bond yield | 1 |
| High commodity prices | 1 |
| High competition among banks | 1 |
| High oil price | 1 |
| Inflation | 1 |
| Political risk | 1 |
| Poor local manufacturing base | 1 |

Table 5-8 below indicates how the abovementioned factors result in financing decisions and measures taken by the respondents to address those results.

**Table 5-8: Effects of the current macroeconomic environment**

| Description/Construct (Code or Group) | Number of References |
|---|---|
| Increased cost of funding | 6 |
| No long-term effects | 6 |
| Reduced government ability to pay guarantees | 4 |
| Socioeconomic unrest | 3 |
| Affects liquidity | 2 |
| Difficulty in raising hard currency | 2 |
| No effects on private sector finance | 2 |
| Reduced IRR | 2 |
| Safety and security of projects | 2 |
| Decreased investment attractiveness | 1 |
| Increased project cost | 1 |
| Less attractive equity investment | 1 |
| Less attractive loans | 1 |
| Low demand | 1 |
| No effects on ZAR based funding | 1 |
| Reduced profitability | 1 |

### 5.3.5 Impact of COVID on project financing decisions

The objective of this question was to identify the impact of the COVID pandemic on infrastructure finance decisions and whether the impact is viewed as short-term or long-term. The general agreement among the respondents was that the pandemic has a short-term impact, and it affects some sectors, not financing decisions. For example, a respondent representing a bank stated: "*COVID hasn't really impacted the decisions".* Another respondent from the same domain observed: *"I think the impact of COVID is more on a project level where our financing would be subject to our whole projects".* Furthermore, they consider the pandemic has a short-term impact, whereas project finance transaction tenure is very long. The overall impact of the pandemic would thus be negligible. However, they were concerned about the pandemic's fiscal deficit as many infrastructure development funds were redirected to provide social relief grants. Hence, they expressed concern about the

government's ability to fund infrastructure projects in the short term. The following statement summarises their sentiment:

> *"Project finance usually takes a longer term view, rather than very short term. If we see the government's social grants and things as having a shorter term impact, then it shouldn't have a significant impact on the project financing decision. But, again, it impacts the public funding, or the resource of long-term repayment."*

Another respondent representing an equity investment organisation supported the above argument but mentioned the impact of the pandemic on the project cash flow, noting that:

> *"I think, what COVID did is it probably delayed the financial flows of a number of projects by six months or so, if its a project that takes an element of market risk. …delays can have an effect on the project, and you do sometimes need to restructure the repayment of the debt."*

Some respondents, specifically equity investors, consider that the pandemic has changed the project selection methodology. Investors are now looking to invest in low-income elasticity assets or government-backed projects that are not linked to the market or GDP fluctuations, such as renewable energy plants. The following statement of an equity investment professional clarifies the above argument:

> *" …a lot of investors are looking for more renewable energy assets in the investment companies, because they've seen how defensive it is against a black swan event like COVID. If you look at something like the Gautrain, I mean, no one was using the train for two years. Now imagine if you are an investor in the train, you probably suffered."*

Table 5-9 below provides an overview of the impact of the pandemic on infrastructure financing decisions. It can be seen in the table that the respondents overwhelmingly agree that COVID's impact is specific, which includes increased attractiveness of the renewable energy and optic fibre sectors and reduced attractiveness of transport, especially passenger transport and private health care sectors. They also agree that COVID has constrained the government's fiscal space and its ability to fund infrastructure projects in the short term.

**Table 5-9: Impact of COVID on project financing decisions**

| Description/Construct (Code or Group) | Number of References |
|---|---|
| Sector specific impact | 26 |
| Constrained government fiscal space | 6 |
| No long-term impact | 5 |
| Decreased government ability to pay guarantees | 3 |
| No impact of COVID | 3 |
| Shortage of foreign experts (movement restrictions) | 3 |
| Expensive risk insurance | 2 |
| Impacts project cashflow | 2 |
| Increased liquidity in the mining sector | 2 |
| Less business for the banks | 2 |

## 5.4 Research Question 3

**What measures can be taken to leverage South Africa's positive factors and mitigate the risk emanating from the negative factors?**

Having identified the macroeconomic factors influencing infrastructure financing decisions and the characteristics of the current macroeconomic environment, the study aimed to identify future challenges and opportunities in infrastructure financing presented by the macroeconomic factors. The ultimate aim was to identify how those factors could be addressed to encourage private financing in infrastructure development.

### 5.4.1 Future opportunities and challenges

The respondents were asked to express their opinion on the future opportunities and challenges and in the infrastructure financing space from a macroeconomic point of view. Many respondents believe that the current trend of reform and planning in infrastructure development will help mobilise funds from the private sector as expressed in the following statement:

*"The president is able to implement his reform agenda, and some sort of more market friendly and investor friendly measures. I think, we can see some nice growth and some nice gains."*

A respondent supported the above position and further stated the country had a stable political and regulatory environment conducive for infrastructure financing, as explained below:

*"… there has been such real tangible movement, in terms of positive steps government has been taking to bring infrastructure to market to bring the type of project the market wants to see. I don't feel like we are going to see significant, you know, political or regulatory, or enabling environment type challenges."*

Some respondents consider that the current push for renewable energy development would create many financing opportunities. Some respondents noted that there is enough liquidity in the market for infrastructure development, and the reform measures will assist in unlocking investment from markets. In addition, it is anticipated that there will be fewer regulatory and political challenges for infrastructure development.

However, respondents also expressed concern over the government's tight fiscal position and its ability to provide guarantees in the future. As one respondent mentioned:

*"… our government is now in a very tight fiscal position. So they'll find it hard to provide the guarantees."*

Similarly, another respondent mentioned:

*"… the government will always promise. In other words, the government will always say, yeah, let's do this project. I can provide the guarantee… But the financial statements are saying something completely different."*

Some respondents expressed concern over concentration risks or the limited number of off-takers in some sectors, such as ESKOM in the energy space and Transnet in the freight rail space. The following statement explains:

*"The other worry that we do have is ESKOM, and that's the concentration risk that we look at as well. I mean if they're the sole off-taker."*

Table 5-10 below provides an overview of the future challenges and opportunities in infrastructure financing as expressed by the respondents.

**Table 5-10: Future opportunities and challenges in infrastructure financing**

| Description/Construct (Code or Group) | Number of References |
|---|---|
| Opportunities/ positive aspects | |
| Implementation of effective policies and plans | 4 |
| Opportunity in the renewable energy sector | 4 |
| Availability of liquidity in the market | 3 |
| No major risk | 2 |
| Bankable project preparation initiative (supply of bankable projects) | 1 |
| GDP growth | 1 |
| Improved employment rate | 1 |
| Improved exchange rate | 1 |
| Infrastructure development push | 1 |
| Low interest rate | 1 |
| Privatisation of infrastructure | 1 |
| Rejuvenation of the construction sector | 1 |
| Sound monetary and fiscal policy | 1 |
| Young population - demographic dividend | 1 |
| Challenges/ Negative Aspects | |
| Government ability to provide guarantee | 7 |
| Concentration risk | 3 |
| High oil price | 1 |
| Import challenges | 1 |
| Increased interest rate | 1 |
| Lack of bankable projects | 1 |
| Lack of capable construction companies | 1 |
| Lack of liquidity | 1 |

### 5.4.2 Effectiveness of government measures to mitigate the future challenges

The objective of this question was to understand the financiers' perspective of the government's ability and effectiveness to address future challenges and take advantage of the positive aspects to provide a conducive environment for mobilising finance from the private sector. The responses portray a mixed picture of the government's ability to address the above. Many respondents believe that the ongoing reform and infrastructure push is effective, but it lacks a proper implementation mechanism that can create a pipeline of bankable projects. The following statement describes this situation:

> *"There's a department within the presidency, that's looking at infrastructure across the board, in trying to spur private sector investment. So that's very positive. So, you see good things happening. It's just not taking it to the next step, taking it to implementation."*

A respondent endorsed the above position and welcomed the steps taken to create bankable projects. However, those steps are often not adequate as can be inferred from the statement below:

> *"I think there've been positive signs from the government, but its not just taking it through the system, getting these bankable projects to the market. Because I think what governments sometimes forget is that the person on the other side needs to earn a return on this investment."*

One respondent also considered that the government has done a lot to bring the private and public sector closer but the process has been slow:

> *"I believe the past two years has seen private sector public sector working a lot more collaboratively, in terms of finding solutions to dealing with some of these challenges. Unfortunately for us, working in the infrastructure space, the wheels turn very slowly. And the lead times are very long."*

Some respondents think the government and the South African Reserve Bank (SARB) have a sound monetary and fiscal policy and have managed inflation relatively well. As one respondent stated: "*Reserve Bank is highly regarded, and they do a pretty good job."* Another respondent reinforced this view:

*" …our government genuinely sets targets for inflation, and they've done incredibly well to keep it within that band."*

Some respondents welcome the government's decision to split up ESKOM to avoid concertation risk:

*"The government is trying to mitigate that risk (concentration risk) by splitting ESKOM into three as the off-taker. So its restructuring of the power off-taker."*

However, a few respondents felt that the government is not doing enough to attract private sector finances for infrastructure development as explained below:

*" …the government's trying to do what it cannot. I don't even think the government knows, you know, what the government's got to do what economic theory tells them, which is, to give incentives to business to survive to give them subsidies and all of that stuff. ... So, are they doing it? No."*

*"I think our government seems to be very, very complacent, and they almost reactive, they test the waters, a lot of things that they could have done better over the last 18 months."*

Some respondents believe the government's fiscal constraints undermine its ability to finance projects and implement reform measures. Table 5-11 below provides a summary of the measures taken by the government to attract private sector finance for infrastructure development.

**Table 5-11: Measures taken by the government to mitigate infrastructure financing challenges**

| Description/Construct (Code or Group) | Number of References |
|---|---|
| Positive/ effective measures taken | |
| Effective inflation targeting | 6 |
| Effective policies and plans for infrastructure development | 5 |
| Effective fiscal policy | 3 |
| Push for reform | 3 |
| ESKOM restructuring (splitting up) | 2 |
| Strong political will to reform | 2 |
| Support for PPP projects | 2 |
| Assisting construction companies | 1 |
| Effective measures to stabilise the exchange rate | 1 |
| Ineffective measures/ Work to be done/ Negative aspects need to be eliminated | |
| Financial constraints (the ability of implement projects) | 3 |
| Ineffective political framework (corruption, populist agenda) | 3 |
| Limited political will (to implement reforms) | 3 |
| Slow progress of reform and policy implementation | 3 |
| No support for non-energy sectors | 2 |
| Increasing political risk | 1 |
| Lack of support for local manufacturing base (for solar panels and wind turbines) | 1 |
| Restrictive investment policy | 1 |

### 5.4.3 Creating a conducive environment for infrastructure financing

Through this question, the researcher wanted to identify a conducive environment for infrastructure financing as perceived by the financiers. Respondents overwhelmingly agree that a clear long-term vision for infrastructure development and its efficient implementation is central to creating the environment. A respondent specified the need for a long-term vision and emphasised the importance of creating a sound partnership with the private sector:

> *"Its all about creating a clear vision and having a trusting relationship with the private sector. And that will enable people to plan better because the private sector is entrepreneurial, and guys want to make money. So the more clear you are in your vision, you know, the better you will be able to attract capital."*

A respondent endorsed the requirements for a clear vision and gave the example of REIPPPP as a success story. However, the respondent pointed out the absence of similar vision for other sectors:

> *"I think the key one would be long term visibility. So you know, so in SA, for example, we've got the REIPPPP, which kind of defines what the energy landscape looks like, over a period of time, we don't necessarily have something similar in the infrastructure space."*

A respondent reiterated the need for focus and investment in other sectors driven by a sound policy framework and backed by strong political will:

> *"Government needs to apply the same amount of rigor or investment in other sectors… And that programme needs to be similar, or maybe better than REIPPP… There needs to be political will, driven by policy underpinned by a sound environment, regulatory and investment friendly climate, to ensure that these investments occur."*

Other key considerations are providing a stable political environment, ensuring an effecting regulatory framework, creating a business-friendly environment by easing business laws and reforming labour laws, privatisation of infrastructure assets and addressing the monopoly of government agencies and municipalities in infrastructure development, ensuring certainty in regulations, as well as stable currency exchange rate and reparation. The following statements capture the essence of the above argument:

> *"I think in the South African environment, it would be the privatisation of the energy industry. I think maybe the privatisation of other infrastructures as well. If you look at rail, for example, the government has a monopoly on that. On the ports, they have a monopoly through Transnet as well. So, I think privatisation would open up the industry significantly. And then, of course, improved labour laws would help. So less unions. "*

*"Its all about having an enabling environment, its basically having the right economic policies, its having the right regulatory and legislative framework to make sure that you make it as comfortable as possible for investors. It also means political stability, being able to showcase good macroeconomic conditions, making sure that you've got the regulatory environment and the fiscal environment in place that will incentivise investors to come in. Its also about having visibility of investments initiatives."*

*"I think the government should also simplify some of the procurement processes that they have... And simplify the process of doing business in South Africa."*

The respondents highlighted the need to develop sound partnerships between the private and public sectors. As one respondent mentioned, "*PPPs are the way to go"*

A respondent mentioned the need to reduce the tax rate or create spaces where investors benefit from preferential tax policy:

*" …taxation is quite high, and I think that's what the government's got to do is look at creating special economic zones where you can get preferential tax treatment."*

Many respondents believe that the government's ability to provide guarantees and the rising debt-to-GDP ratio are two critical risks in infrastructure financing, but these two factors do not feature in the requirements for creating a conducive environment for attracting private finance for infrastructure development.

Table 5-12 below provides a summary of the requirements and characteristics of an infrastructure investment friendly environment as considered by the research participants.

**Table 5-12: Characteristics of a conducive environment for infrastructure financing**

| Description/Construct (Code or Group) | Number of References |
|---|---|
| Policy certainty and long-term vision | 15 |
| Sound regulatory framework | 8 |
| Political stability and soundness | 7 |
| Reform in labour and business laws | 7 |
| Privatisation of infrastructure | 5 |
| Certainty in regulations | 4 |
| Currency convertibility and stable exchange rate | 4 |
| Good relationship b/w private and public sectors | 4 |
| Support non-renewable energy plants and other infrastructure | 4 |
| Avoid concentration risks | 3 |
| Implement more PPPs | 3 |
| Skills Development and Capacity Building | 3 |
| Power sector reform | 2 |
| Fiscal prudence | 2 |
| Develop SEZs | 1 |
| Efficient government planning | 1 |
| Reduce tax rate | 1 |
| Reduce the barriers for skilled immigration | 1 |
| Right economic policies | 1 |
| Right legislative framework | 1 |
| Implement sector specific programmes | 1 |
| Simplicity in development programmes | 1 |
| Sound financial system | 1 |
| Stable economy | 1 |
| Supply of bankable projects | 1 |

## 5.5 Conclusion

The results of the semi-structured interviews conducted with professionals serving in the private infrastructure finance sector were provided above. Some of the findings support the existing literature, while others do not. Chapter 6 analyses the results and compares them with the literature.

It is pertinent to mention that financiers did not disclose sensitive information such as, but not limited to, lending rates and project IRRs.

# Chapter 6: Discussion of Results

## 6.1 Introduction

This chapter analyses the interview results in the context of the literature presented in Chapter 2. Based on the analysis, a framework has been developed to leverage the macroeconomic factors applicable to the South African context for mobilising private sector finance for infrastructure development.

## 6.2 Question 1

**What are the key macroeconomic factors influencing financing decisions for infrastructure projects in South Africa?**

The objective of this question was to identify the macroeconomic factors influencing financiers to invest in infrastructure projects in South Africa.

### 6.2.1 Key challenges associated with infrastructure financing

Through this question, the researcher wanted to identify the main challenges associated with infrastructure investment in general and observe how frequent macroeconomic factors are considered as key challenges. Table 5-1 highlights private sector financier views on the challenges associated with infrastructure investment. It can be seen in the table that the inefficient regulatory environment of a country poses the greatest challenge to infrastructure investment. The other challenges are the inefficient political environment, lack of market demand, lack of bankable projects, currency convertibility and exchange rate issues, and lack of government guarantees. Additional challenges, though not mentioned frequently by the respondents, are lack of political will, limited opportunities for the private sector to participate in the infrastructure market, low manufacturing base, tax rate and poor GDP growth.

Overall, the findings are consistent with the literature as project financing decisions are affected by several factors such as political, regulatory, macroeconomic and policy contexts. The result highlights that the challenges associated with

infrastructure investment fall within the broad political and institutional spectrum that encompasses regulatory framework, political framework and policy perspectives. Many scholars, including Kasri and Wibowo (2015), Sharma (2012), Yurdakul (2021), Ruiz Díaz (2020) and Banerjee et al.(2006) highlighted the importance of political and regulatory mechanisms in attracting private sector finance for infrastructure development. Hence the study finding supports the studies undertaken by the aforementioned scholars. It is pertinent to mention that most of the study participants emphasised the importance of the government's ability or willingness to honour contractual obligations and provide a stable political environment throughout the duration of the investment in leveraging private finance for infrastructure development.

The finding also notes the importance of macroeconomic factors such as currency convertibility and exchange rates and supports the findings of Yescombe (2007), Crăciun (2011), Platona et al. (2014) and Banerjee et al.(2006). According to the respondents, the currency convertibility and exchange rate issues become prominent if a large portion of the total investment is made in any non-local or hard currencies.

Some respondents have noted the issue of project bankability. Bankability in the current context is understood as the combination of a project's financial, economic and technical viability that could attract private financiers (Zhu & Chua, 2018). Many organisations and scholars have identified the need for preparing bankable projects when mobilising private finance for infrastructure development (CEPA, 2015; UN-OHRLLS, 2020). Many respondents pointed out that the current bankable projects are generally from the renewable energy, optic fibre, and transport sectors.

The responses regarding whether financiers prefer to invest in greenfield or brownfield projects are shown in

Table **5-2**. The results indicate that most debt financers have no preference if the project can service the debt. On the other hand, most equity financers prefer brownfield projects. This contradiction in preference can be attributed to the risk aversion nature of financiers (Bailey et al., 2009, as cited in Okanlomo, 2015). The debt financiers are generally the senior debt holder who are paid off first and can seize the infrastructure asset over non-servicing of the debt. In comparison, equity investors invest for the long term and are exposed to more risk (OECD, 2015b). By

investing in brownfield projects, equity investors try to minimise construction and technological risks.

To conclude, the feedback received from the respondents confirms the findings of the literature. The findings suggest that a government's commitment to honouring contractual agreements and ability to create a stable political and macroeconomic environment and supply bankable projects will positively impact attracting infrastructure investment. The risk-averse nature of project financiers underpins the requirements of government guarantees for attracting private investment in infrastructure projects.

### 6.2.2 Important macroeconomic factors

Through this question, the researcher wanted to understand what macroeconomic factors are considered important by financiers. In the context of infrastructure financing, macroeconomic factors are those factors related to the country's economic environment and its various aspects that affect project investment; and scholars have varying opinions on what those factors are, and the range of those factors could be extensive or restrictive (Crăciun, 2011),

It can be seen in Table 5-3 that currency convertibility, exchange rate, government guarantee on project performance, the effectiveness of the regulatory environment, sovereign credibility, demand for the infrastructure and its revenues, people's affordability and interest rate are considered to be some of the macroeconomic factors affecting project financing decision. The finding of the study is consistent with the literature.

Yescombe (2007), Crăciun (2011), Platona et al. (2014) and Sharma (2012) found that inflation rates influence project financing decisions. Inflation affects institutional and private investors who generally look for long-term and inflation-protected returns (UN-OHRLLS, 2020). A high inflation rate increases the WACC (Rao, 2018) and deters private investors from financing infrastructure projects. Crăciun (2011) and Sharma (2012) highlighted the importance of currency convertibility and stable exchange rate in successful project financing decisions. When liabilities and revenues are in two or more different currencies, the issue of exchange rate and currency convertibility becomes critical. (UN-OHRLLS, 2020). Most of the

respondents indicated that in most cases, a portion of their funding is in hard currencies. Hence, South African financiers are exposed to currency convertibility and exchange rate factors. Both the literature and study finding highlight the requirements for government guarantees and risk insurances to hedge inflation and exchange rate risks. Therefore, the study finding related to exchange rate, inflation and the measures to mitigate those risks is consistent with the literature.

The study underpins the importance of a sound and effective regulatory environment, which was found to be important by many scholars, including Kasri and Wibowo (2015), Sharma (2012), Yurdakul (2021), Ruiz Díaz (2020) and Banerjee et al.(2006). The study found that sovereign credibility is an important consideration for private investors. In the context of the present study, credibility is considered as a government's willingness to honour contractual obligations. Breen and Mcmenamin (2013) found economic agents such as lenders and investors keep track of how governments either fulfil or renege on contractual obligations. Lenders demand a higher interest rate if the government is less credible or has an inconsistent history of honouring its promises. Many research participants indicated that sovereign credibility is poor in many African countries. However, they consider South Africa's credibility is high, and they have not experienced any instances where the government failed to fulfil its contractual obligations.

The study finding also highlights the importance of consistent demand for infrastructure services and consumers' affordability to pay for those services. The literature that considers these two aspects as macroeconomic factors was not readily available. However, the need for a large market size to make infrastructure projects financially attractive could be found in the works of Platona et al. (2014), Kasri and Wibowo (2015), and Banerjee et al.(2006).

Research participants indicated that a country's debt-to-GDP ratio and credit rating are two major macroeconomic factors for successfully leveraging private finance for infrastructure development. These findings are consistent with the literature. Campanella et al.(2018), Ramela (2017), and Iyer and Purkayastha (2017) found that credit rating is an important criterion for a project financing decision. Rao (2018) considers that the debt-to-GDP ratio is an important consideration for project

financing decisions. It can measure the possibility of sovereign default and the country's ability to honour contractual obligations.

Yurdakul (2021) considers a country's foreign reserves, FDI inflow, and money supply are central macroeconomic factors affecting project finance decisions. However, no research participants mentioned these factors during the discussions. It is also important to mention that many participants, all representing commercial banks, consider that macroeconomic factors are unimportant to them as they lend at an interest rate linked to JIBAR. However, they consider the credibility and credit rating of the counterparties before extending loans to them.

### 6.2.3 Sector-specific macroeconomic factors

Most respondents consider that macroeconomic factors do not vary from sector to sector. However, the importance of the factors varies from sector to sector. For example, according to a respondent, the creditworthiness of the counterparty and a strong off-taker agreement are considered the most important factors to determine whether to finance a power plant project. However, for financing a toll road, assessing GDP growth is more important as there is a strong link between traffic volume growth and GDP. Another respondent pointed out the complex dynamics of macroeconomic factors in predicting demand for an infrastructure asset, explaining that the volume of inbound cargo handled by a port depends on domestic consumption and economy, but the volume of outbound cargo depends a lot on the international economy. Hence, both domestic and international economies define the need or demand of the port. It can be observed that the macroeconomic factors do not differ much from one sector to another, but their importance or weighting varies. Furthermore, those macroeconomic factors may influence or determine project characteristics in complex ways.

Most respondents do not have a preferred sector, but they want to invest in sectors with low risk and predictable cash flow for the project duration. A majority of the respondents are currently engaged only in the power, specifically renewable energy, sector. The overwhelming representation of the power sector professionals among the respondents can be attributed to the demand created by the ongoing renewable energy programme and the government's commitment to supporting the programme. Considering the share of the power sector professionals as proxy for the share of

power sector finance transactions, the study's finding supports that demand and political environment are key factors in project financing decisions.

### 6.2.4 Macroeconomic factors relevant in South Africa

The researcher wanted to understand which macroeconomic factors are considered relevant in South Africa by financiers. The interviewees were requested to identify macroeconomic factors they consider important for the South African context from the list of macroeconomic factors they had previously identified in the discussion. The results of the discussion are presented in Table 5-4.

The main macroeconomic factors in the South African context are inflation, regulatory environment, political environment, currency convertibility and exchange rate, government guarantee and risk insurance, the capacity of the local manufacturing base to meet the local content requirements, people's affordability interest rate, and debt-to-GDP ratio.

The importance of considering inflation in project financing decisions is highlighted by Yescombe (2007), Crăciun (2011) and Platona et al. (2014). A high inflation environment deters private investors from financing infrastructure projects since it increases the cost of capital (Rao, 2018) and reduces the real return on investment. Though respondents consider inflation a key macroeconomic factor, they consider the South African Reserve Bank has so far controlled inflation reasonably well.

The study findings highlight the importance of a sound and effective regulatory and political environment, which is consistent with the literature and studies conducted by Kasri and Wibowo (2015), Sharma (2012), Yurdakul (2021), Ruiz Díaz (2020) and Banerjee et al. (2006). The political and regulatory environment includes transparency in dealings, bureaucratic efficiency, and the government's ability and willingness to enforce and adhere to contractual obligations. Most respondents consider South Africa's credibility is high, and they have not experienced any instances where the government failed to fulfil its contractual obligations.

Similar to the literature, the findings of the study consider currency stability and exchange rates as crucial macroeconomic factors (Yescombe (2007); Crăciun (2011); Platona et al. (2014)). A portion of every infrastructure finance transaction is made in hard currency; hence a stable and predictable exchange is considered

important by the financiers. The research participants mentioned these two factors the most often when they were asked about their opinion on macroeconomic factors in the global context, but they consider these factors as less important in the South African context as a majority of the deals are made in the local currency.

The respondents highlighted the capacity of local industries to meet the local content requirements of the projects. Interestingly this factor could not be found in the existing literature. This may be a specific South African requirement as the research participants did not mention it when they were asked to provide a general list of macroeconomic factors they consider important in making infrastructure financing decisions.

Other factors considered as important include people's affordability to pay for infrastructure services, demand for services, interest rate, and debt-to-GDP ratio of the country which have all been addressed in the literature. Many scholars consider sovereign credit rating and GDP growth important, but for the South African context these factors were mentioned by only two participants.

The discussions with the project financiers revealed that many debt financing professionals do not consider macroeconomic factors as important for making project financing decisions in South Africa. They consider the political environment, regulatory environment and project's economic and financial characteristics as being of greater importance. On the other hand, equity financing professionals consider inflation, interest rate, and exchange rates are also important in addition to the factors considered important by debt financing professionals. According to two debt financiers, debt financiers do not consider the interest rate and inflation rate important because their lending rate is linked to the JIBAR.

## 6.3 Question 2

**How do those factors influence project finance decisions?**

This question aimed to understand how and to what extent macroeconomic factors influence project financing decisions. This question also examined the perception of the financiers on South Africa's current macroeconomic outlook in terms of

opportunities and challenges presented by it and the impact of COVID-19 on project financing.

### 6.3.1 Investment risks with the macroeconomic factors

The risks associated with infrastructure financing are shown in Table 5-5. Interviewees agreed with the literature in terms of the types of macroeconomic risks involved in project financing.

However, it can be observed that a few of the identified risks are not related to the identified macroeconomic factors. For example, the respondents mentioned construction risk the greatest number of times, but this risk could not be classified as macroeconomic risk. In a survey conducted by the World Economic Forum (2016), the research participants who were from various global equity investors, institutional investors, and commercial banks also considered construction risk as the most critical risk in project finance.

It has been observed that equity investors and debt financiers have different risk perceptions. The interview results suggest that while debt financiers place importance on construction risk, off-taker's credibility, and uncertainties around laws and regulations, equity investors consider construction risk, inflation, exchange rate, and interest rates more important than other factors in decisions related to infrastructure finance.

### 6.3.2 Understanding risk characteristics and mitigation measures

The study findings suggest that risks associated with infrastructure investment can manifest at any phase of the project. The risk mitigation measures depend on the type of risk. Construction and operations related risks are mitigated by engaging credible and experienced contractors and securing performance guarantees from them. Political and commercial risks are covered through political and commercial risk insurances. However, no such insurance is purchased to cover risks emanating from unstable inflation, interest, and exchange rates due to the high cost involved with such insurances. These risks are covered by creating conservative financial models that ensure that the expected return allows for the adversities created by those factors.

### 6.3.3 Investment exit strategy

The research findings indicate that private sector financiers do not have any particular investment exit strategy before the automatic termination of the financing duration or agreed holding period. And that financiers generally take a long-term approach and look to stay invested in the project throughout the agreed duration of the project. The long-term view of financiers helps them to promote a good reputation of being a partner in the development and a strong brand in the financial market (Okanlomo, 2015). Exits are considered only when the projects are unable to meet to contractual agreements, and all possible steps have been taken to rectify the problems.

It was noted in the discussions that no respondent ever considered exiting from investment due to changes in the macroeconomic environment or felt the need to do so. This can be interpreted in two ways. First, the study findings reveal that financial models developed to assess the project take adequate measures to cover the risks created by macroeconomic factors. Second, it can be interpreted as the low importance of macroeconomic factors in forcing financiers to exit from an investment.

### 6.3.4 Effects of the current macroeconomic environment on infrastructure financing

As shown in Table 5-7, according to respondents, the key characteristics of the current macroeconomic environment are a high debt-to-GDP ratio, poor credit rating, exchange rate volatility, high unemployment rate, and recently undertaken reform measures and infrastructure privatisation initiatives. The current macroeconomic environment results in increased cost of funding, government's reduced ability to provide and pay for guarantees, socio-economic unrest, reduced liquidity, and increased difficulty in raising hard currency. In some instances, the current government policies such as the reform measures, privatisation initiatives and support for renewable energy development have lowered the cost of funding and capital. Some respondents observed that the current socio-economic environment does not affect their decisions as they plan for the long-term (20-30 years).

The findings of the study generally support the work of Campanella et al. (2018), which suggests that macroeconomic factors can positively or negatively influence

infrastructure finance decisions. From the perspective of the macroeconomic factors, the findings support the earlier studies exploring the effect of sovereign credit rating and debt-to-GDP ratio on project financing and capital cost (Iyer & Purkayastha (2017); Hammami et al. (2006); Rao (2018)).

Consistent with the literature (Yescombe (2007); Crăciun (2011); Platona et al. (2014)), respondents agree that the exchange rate is a principal consideration when a portion of the funding is derived in hard currency. However, the effect of the exchange rate is not apparent for bank financing as hard currency funding is generally made through the banks' overseas centres which are mostly based in London. The findings also support Ramela's (2017) study involving the effects of socio-political impact on PPP projects in which it was found that poor socioeconomic conditions such as high unemployment rate and safety and security issues deter financiers and investors.

However, the study does not support Rao's (2018) findings regarding banks' non-preference of sectors to finance infrastructure projects within the same macroeconomic environment. As South Africa's macroeconomic conditions increased the cost of funding and capital in general, the effect cannot be seen in the renewable energy sector. Banks have reduced their lending rates to remain in the market for the long term for this sector. A reason for this phenomenon is the sector's positive outlook created by the government's continued support for the sector and the reforms carried out to encourage investors. Hence, the banks are not agnostic among different sectors.

### 6.3.5 Understanding the impact of COVID on project financing decisions

The respondents agree that the pandemic has no long-term effect, and it has not changed the project financing mechanisms. It has, however, affected the performance and attractiveness of some sectors in South Africa. For example, it has been found that due to lockdown, people stayed at home which eventually increased the demand for optic fibre connection despite the average per capita income being negatively impacted during the lockdown. The sudden demand increased the attractiveness of the sector, and more investors are now looking to invest in this infrastructure. Similarly, the renewable energy sector performed well during the lockdown. On the other hand, the transport sector, especially the passenger

transport sector such as Gautrain, did not perform well. Hence, the macroeconomic environment created by the pandemic does not influence the performance of the sectors, but rather their inherent characteristics affect project performance.

Respondents agreed that COVID has a short-term impact on project financing and project performance, but they expressed concern about the government's ability to fund infrastructure projects for the short term as a significant portion of the funds identified for infrastructure development has been allocated to COVID relief programmes. The government's reduced financial ability to fund infrastructure projects or provide guarantees for infrastructure development can negatively impact infrastructure development (Rao (2018); Hammami et al. (2006)). In addition, it might increase the price of pandemic or similar insurances, which will eventually affect project financials.

Since COVID is new a phenomenon, its impact on infrastructure finance has not yet been properly assessed and documented, and its effects cannot be comprehensively identified. It has certainly changed the levels of attractiveness of various sectors which will affect financing decisions for those projects.

## 6.4 Question 3

**What measures can be taken to leverage South Africa's positive factors and mitigate the risk emanating from the negative factors?**

Having identified the macroeconomic factors influencing infrastructure financing decisions and the characteristics of the current macroeconomic environment, the study aimed to identify future challenges and opportunities in infrastructure financing presented by the macroeconomic factors. The aim was to identify how those factors could be addressed to encourage private financing in infrastructure development.

### 6.4.1 Future challenges and opportunities

The researcher intended to understand the future challenges and opportunities associated with infrastructure financing in South Africa, specifically from a macroeconomic point of view. As shown in Table 5-8, the anticipated opportunities are the implementation of the existing and proposed infrastructure development plans, the extensive opportunities in the renewable energy sector and the availability

of liquidity in the market. The anticipated challenges are the government's inability to provide guarantees due to the rising debt, concentration risks created by not allowing the private sector to participate in infrastructure development, high oil prices, and the anticipated increase in interest rates.

The most mentioned factor is the government's anticipated inability to provide guarantees. The failure to provide government guarantees can demonstrate the lack of government support, thereby reducing investor confidence, reducing the cost of debt, increasing the returns investors require, and reducing the amount of financing available to a project (Lu et al., 2019) hence its perceived importance is justified. It can be observed, however, that not all future challenges and opportunities are necessarily related to the earlier macroeconomic factors.

The other macroeconomic challenge is the interest rate increase. Respondents agree that the current low-interest environment is good for attracting investment, but its increase might change the situation. Since banks and commercial lenders pass on the interest rate risks to the project SPV, it might become difficult for the SPV to honour interest payments, ultimately leading to project failure (Ruiz Díaz, 2020).

The availability of money in the market for infrastructure investment has been identified by respondents as a crucial future opportunity. Only investors with a clear preference for long-term cash flow and diversification benefits invest in infrastructure assets due to the long-term nature of infrastructure investment. This group of investors is generally a very small subset of all possible investors who prefer to invest in higher liquid assets such as bonds and assets (OECD, 2015b). Therefore, it is important to have liquidity in the capital market to ensure some investment trickles down to finance infrastructure projects.

From the discussion above, it can be concluded that the existing literature justifies the respondents' opinions on future opportunities and challenges. However, respondents considered poor credit and exchange rates two key existing challenges, but these factors did not feature in future challenges. It can be assumed that the respondents consider that these two factors would be effectively mitigated.

### 6.4.2 Effectiveness of government measures

The objective of this discussion was to understand how effectively the government has been able to mitigate the challenges deterring financiers from investing in infrastructure projects. Many respondents believe that the SARB and government have been able to manage inflation effectively, and they have an effective fiscal policy. Another strong theme that emerged from the discussion is the government's current push for infrastructure development. However, the respondents also consider that there is a lack of political will and an ineffective political environment to implement those infrastructure development plans, resulting in the slow progress of implementation. In addition, there is a growing concern about the government's financial constraints and its inability to provide project guarantees. Other considerations are the restrictive investment policy requiring local content in every project and the domestic manufacturing sector's inability to meet the local content requirements.

The importance of political framework and stability in implementing infrastructure projects and creating a conducive macroeconomic environment is underpinned by scholars such Platona et al. (2014), Kasri and Wibowo (2015), and Chan et al., (2010). Hence, the perceived importance of this factor is supported by the literature. However, since establishing the effectiveness and stability of South Africa's political framework is beyond the scope of this study, it is assumed, based on the interview results, that a more effective political framework would be required to implement those implementation plans and create an investment-friendly climate for infrastructure development. The plans thus need to be supported by an investment-friendly climate that can attract investors in the supporting industry and meet the local content requirements. Alternatively, the local content requirement policies and regulations need to be eased.

Similarly, the effect of the government's financial constraint resulting in its inability to provide guarantees is well explored in the literature (Lu et al., 2019). A sound fiscal policy is therefore required to reduce the financial constraints of the government.

### 6.4.3 Creating a conducive environment for infrastructure investment

This part of the discussion wanted to identify the characteristics of a conducive macroeconomic environment that would attract the private sector to finance infrastructure projects. The key factors in creating a conducive or infrastructure investment-friendly macroeconomic environment are providing a stable and effective political environment, implementing a sound regulatory framework, easing business laws, reforming labour laws, privatisation of infrastructure assets, developing sound partnerships between the private and public sector and expanding the infrastructure development market by providing support for non-energy related infrastructure. The identified factors support the argument put forward by Klingebiel and Ruster (2000) that effective macroeconomic framework, political stability, and effective financial sector policies are necessary to mobilise private finance in infrastructure development.

The discussion results confirm the importance of the macroeconomic factors applicable to the South African context identified earlier in the study and generally supports the literature. However, the respondents believe that having a long-term vision for infrastructure development is the most important factor for attracting investment. This factor can be loosely categorised under political and regulatory frameworks as the implementation of a long-term plan requires stability in the political and regulatory environment and long-term commitment from the political institutions implementing the projects. A number of respondents believe that the government's ability to provide guarantees, overall economic growth, and sovereign credit rating are critical factors for infrastructure financing, but these factors do not feature in the requirements for creating a conducive environment for attracting private finance for infrastructure development.

## 6.5 Summary of Findings

The results of the 12 in-depth interviews conducted with professionals engaged in the infrastructure finance sector in South Africa reveal an interesting picture of the macroeconomic factors affecting project financing decisions in South Africa. The following section provides a summary of the findings.

Respondents consider that inflation, currency convertibility, exchange rate, interest rate, and people's affordability (income or GDP per capita), sovereign credibility (credit rating) and government ability to provide guarantees are important factors that affect any project financing decision. In addition to the above, many respondents noted the regulatory environment, political environment, and availability of political and commercial risk insurance as important macroeconomic factors. However, not all the above factors are applicable to the South African context. The main macroeconomic factors applicable to the South African context are inflation, regulatory environment, political environment, currency convertibility and exchange rate, debt-to-GDP ratio, the capacity of the local manufacturing unit to meet the local content requirements, people's affordability, and interest rate.

An important finding of the study is that debt and equity financiers have different perceptions on macroeconomic factors relevant to the South African context. Equity financing professionals examine a wider range of macroeconomic factors such as inflation, interest rate, currency convertibility, exchange rate, political environment, regulatory environment, and a project's economic and financial characteristics. Debt financing professionals assess the political environment, regulatory environment, and a project's economic and financial characteristics as more important. The reason for this contradiction lies in the nature of finance. In South Africa, debt finance comes from commercial banks, and the transactions are made in the local currency (ZAR). Hence, they do not attach great importance to currency convertibility and exchange rate. In addition, the lending rate is floating, which is linked to JIBAR. On the other hand, many equity investors raise funds in hard currency, and their returns are in the local currency. As a result, exchange rate and currency convertibility become major assessment criteria since real returns depend on interest rates and inflation. Hence, these are additional factors in assessing an investment opportunity.

Most respondents mentioned that they do not have a preferred sector, but they want to invest in sectors with low risk and predictable cash flow for the project duration. A majority of the respondents are currently engaged only in the power sector, specifically the renewable energy sector. The overwhelming representation of the power sector professionals among the respondents can be attributed to the demand created by the ongoing renewable energy programme (REIPPPP) and the government's commitment to supporting it. Therefore, it can be said that the finding

of the study supports that demand and political environment are central factors in project financing decisions. The political support and market demand coupled with a long-term vision for a programme can also assist in creating a conducive environment for financiers to compete against each other. The study found that the cost of financing for the REIPPPP has decreased in recent years as the banks have been competing against each other to have renewable energy projects in their portfolio.

The study findings suggest that construction risk is the most critical risk in project financing. However, this risk cannot be classified as macroeconomic risk. The key macroeconomic risks associated with project finance are a high inflation rate, a material depreciation in the foreign exchange rate, and an increase in the interest rate. These three factors can make a difference in the project value of the investment and the actual value received after the investment period. According to the study, the other macroeconomic risks are political and regulatory uncertainties and the government's inability to provide or honour performance guarantees. Financiers consider a range of mitigation measures to minimise the impact of identified risks. For example, construction and operations related risks are mitigated by engaging credible and experienced contractors and securing performance guarantees from them. Political and commercial risks are covered through political and commercial risk insurances. However, there is no insurance to cover risks emanating from inflation rate, interest rate and exchange rate due to the high cost involved with such insurances.

These risks are covered by developing conservative financial models that ensure that the expected return covers the adversities created by these factors. Financiers, mostly equity investors, expressed concern about the rising debt-to-GDP ratio as it in part indicates the government's ability to honour contractual obligations and guarantees. As a result, many investors are asking for additional credit enhancement from governments. Despite the challenges, according to the financiers, there is no liquidity issue in the country at this point in time. The financiers consider that the current push for infrastructure development and reform measures could bring in investment in renewable energy and other sectors. However, they also consider that the lack of political will to implement the infrastructure development plan could discourage investors from financing infrastructure projects.

The study also found that a long-term plan for infrastructure development and the political commitment to support the plan is essential for creating a conducive environment for attracting private sector finance for infrastructure. The other attributes of the conducive environment are undertaking reform measures such as relaxing business laws, reforming labour laws, privatisation of infrastructure assets; developing sound partnerships between the private and public sector; and creating opportunities for investment in other sectors.

## 6.6 A Framework to Leverage Macroeconomic Factors

Having considered the interview results and analysis of the results, a framework to leverage the macroeconomic factors to attract private sector finance for infrastructure development is presented below.

**Table 6-1: A framework to leverage the identified macroeconomic factors**

| Identified macroeconomic factor | Effect | Identified positive factors / opportunities | Identified challenges |
|---|---|---|---|
| Inflation | • Increases cost of capital<br>• Reduces return on investment, especially of equity investors | • SARB has managed it well | • A high inflation increases the burden on equity investors |
| Regulatory Environment | • Stable political and regulatory environment boots investors' confidence by reducing uncertainty<br>• Unstable environments increase the risk perception of investors and their demand for better returns from the investments<br>• Increases overall project cost to cover risk insurance costs | • Financiers' confidence in SARB<br>• Government's track record of honouring contractual obligations | • Corruption and opaque deals<br>• Fear of nationalisation of infrastructure |
| Political Environment | | • Stable political environment<br>• Government's push for infrastructure development<br>• Proposed reforms such as splitting up ESKOM<br>• Ongoing support for the REIPPPP has created a good financing environment | • Lack of political will and political resistance to implementing the reform measures |

| Identified macroeconomic factor | Effect | Identified positive factors / opportunities | Identified challenges |
|---|---|---|---|
| Currency Exchange Rate | • Devaluation of the revenue earning currency might create credit risk to lenders and return risk to investors if the investment is made in hard currencies | • Banks extend loans in the local currency | • High cost of insurance to cover exchange rate risk |
| Guarantee and Risk Insurance | • Protects investors from defined losses if certain conditions occur<br>• It makes the project more acceptable and viable to the private sector | • Availability of political and commercial risk insurance | • Increases project cost |
| Local Content Requirements | • Local job creation<br>• Boost to the local economy<br>• Reduced import<br>• Less burden on foreign reserves | | • The inability of local manufacturing units to fulfil the requirements<br>• Lack of a long-term development vision does not encourage manufacturers to establish plants in South Africa<br>• Ease of doing business in South Africa / Red tape<br>• Lack of skills |
| People's affordability | • Indicates whether people can afford the services offered by an infrastructure asset | • Not identified as a challenge or barrier to investment (can be interpreted as the effect of this factor is not important to financiers) | • A decrease in people's affordability can reduce demand for infrastructure services (e.g. fewer cars using toll roads) |

| Identified macroeconomic factor | Effect | Identified positive factors / opportunities | Identified challenges |
|---|---|---|---|
| | | | • The recent drop in per capita income due to the pandemic |
| Interest rate | • Increases cost of capital | • The current interest rate is low<br>• It does not affect bank financiers who base their lending rate on JIBAR | • The interest rate may increase after the pandemic |
| Debt-to-GDP ratio | • Increasing debt ratio can affect the government's ability to provide guarantees, thereby reducing investors' confidence | • Prudency in fiscal policy | • The debt to GDP ratio is growing and can reach 100% by 2023. |
| Credit rating/ Sovereign Credibility | • Poor credit rating increases the cost of borrowing | • The cost debt has gone down for the renewable energy sector despite the poor credit rating (long term vision can negate credit rating effects)<br>• Not identified as a challenge or barrier to investment (can be interpreted as the effect of credit rating is not important to financiers or the credit rating will improve soon) | • Difficult to access capital for government-backed projects from developed markets |
| GDP Growth | • GDP growth can be used as a proxy to assess an economy's ability to pay for the infrastructure<br>• | • Financers have a positive outlook and consider that the economy will grow in future<br>• Not identified as a challenge or barrier to investment (can be interpreted as the effect of GDP growth is not important to financiers) | • Stagnant growth of the economy (Pre-pandemic)<br>• The economy has not recovered from the COVID shock |

| Identified macroeconomic factor | Effect | Identified positive factors / opportunities | Identified challenges |
|---|---|---|---|
| Long term vision | • Reduce uncertainty and build investors' confidence<br>• Can reduce the lending rate as seen in the REIPPPP | • The REIPPP programme's success will encourage long term vision for other sectors<br>• The government's plan for infrastructure development is welcomed by the financiers | • The political will to stick to the plan cannot be guaranteed |

## 6.7 Conclusion

This chapter analysed the interview results in light of the literature presented in Chapter 2. This chapter has also provided a framework to leverage the macroeconomic factors applicable to the South African context for mobilising private sector finance for infrastructure development. The next chapter will conclude the study by summarising the research outcomes and defining the study's contribution to both academia and practitioners. It will also specify the limitations of the study and emerging research areas emanating from the study.

# Chapter 7: Conclusions and Recommendations

## 7.1 Introduction

The previous chapters analysed the study results related to the main macroeconomic factors influencing infrastructure project financing decisions, risks associated with the factors, challenges and opportunities related to them, and developed a framework to leverage those factors to create a conducive environment for infrastructure financing. This chapter provides a summary of the findings and draws conclusions. In addition, this chapter describes the study's theoretical contributions and business applications in terms of how businesses and interested parties can benefit from the study. Finally, this chapter defines limitations applicable to this study and proposes future research areas based on the literature and study results.

## 7.2 Principal Conclusions

The importance of infrastructure in connecting people with people and economic opportunities, delivering essential services and sustaining economic activities can not be overlooked. A country's level of infrastructure can influence residents' well-being, environmental protection, knowledge creation, and economic competitiveness in those areas (Collier & Venables, 2016). Infrastructure is considered a public good, and governments have paid most of the investment for infrastructure development off their balance sheets. However, due to increasing urbanisation and demand for better infrastructure, the public sector alone can no longer bear the cost of infrastructure development and the involvement of the private sector has become necessary. By 2040, South Africa needs to mobilise US$152 billion from the private sector for infrastructure development (Global Infrastructure Hub, 2017).

Several factors limit the private sector's participation in financing infrastructure projects, such as lack of bankable projects, high macroeconomic risks, specifically the growing debt-to-GDP ratio, and a weak policy environment that deters the private sector from financing infrastructure projects. This study identified macroeconomic factors affecting infrastructure project financing decisions and how those factors influence project finance decisions. In addition, the study aimed to develop a

framework to leverage the identified macroeconomic factors to mobilise finance from the private sector for infrastructure development.

To collect data and understand the viewpoints of private financiers, 12 in-depth interviews were conducted with professionals engaged in the infrastructure finance sector in South Africa from three categories of financiers - commercial bank lenders or debt financiers, mezzanine debt financiers and private equity investors engaged in infrastructure financing.

The study findings show that macroeconomic factors applicable to the South African context are inflation, regulatory environment, political environment, currency convertibility and exchange rate, debt-to-GDP ratio, the capacity of the local manufacturing to meet the local content requirements, people's affordability, and interest rate. The findings reveal that debt and equity financiers have different perceptions on macroeconomic factors relevant to the South African context. Equity financing professionals examine a broader range of macroeconomic factors such as inflation, interest rate, currency convertibility, exchange rate, political environment, regulatory environment. Debt financing professionals assess the political environment, regulatory environment, and a project's economic and financial characteristics. Furthermore, the effect of the pandemic on infrastructure financing is negligible and temporary.

There was no preference for a particular infrastructure sector, nor for greenfield or brownfield projects among the debt financiers. Equity financiers preferred brownfield projects to avoid construction risk, which is considered the most crucial risk by all types of financiers. The critical macroeconomic risks associated with project finance are a high inflation rate, a material depreciation in the foreign exchange rate, and an increase in the interest rate. The rising debt-to-GDP ratio is considered a matter of concern as it indicates the government's ability to honour contractual obligations and guarantees. However, despite the challenges, there is presently no liquidity shortage in the market.

Creating a conducive environment that would take advantage of the available liquidity in the market and attract more financiers is ensuring policy certainty and having a long-term vision for infrastructure development. In addition, the infrastructure development plan needs to be backed by the political will to implement

it and include reform measures that will improve the legislative and enabling environment, including improved partnerships between the private and public sectors.

## 7.3 Theoretical Contribution

This study contributes to the literature on macroeconomic factors influencing the private sector's infrastructure development financing, which vary regionally (Campanella et al., 2018). The study identified a set of macroeconomic factors relevant to the South African context. The second contribution of the study is the identification of macroeconomic risks associated with infrastructure financing in the South African context. In infrastructure financing, "private sector financier" should not be considered a monolithic term. This research identified that the banks are willing to reduce the lending rate if the sector has good potential for development and the government is willing to support the industry. This finding underpins the requirement of a long-term infrastructure development vision and political will to access private-sector funds for infrastructure development. The study identified that banks reduce lending rates for sectors they consider important to have on their portfolio. This finding suggests that banks are not sector agnostic and contradicts Rao's (2018) findings. Finally, the study contributed to the general body of academic literature and updated the previous global empirical findings in the infrastructure financing area with recent information

## 7.4 Implications for Management and Other Relevant Stakeholders

The debt-to-GDP ratio is a major barrier to attracting private sector finance in South Africa (Phalatse, 2021). This research attests to this proposition; however, at the same time, it expands the understanding of the macroeconomic factors with similar effects on the private sector's financing decisions. The macroeconomic factors as identified will inform project sponsors and the public sector about project financiers' perceptions of positive and negative aspects of the macroeconomic environment.

The identified macroeconomic factors and the development of the leveraging framework as described in the previous chapter will assist in taking the necessary steps to create an enabling environment for mobilising private funding for infrastructure development and implementing infrastructure development plans, such as the South African Economic Reconstruction and Recovery Plan (2020).

## 7.5 Limitations of the Research

The type of responses received in the interviews is the study's first limitation. The study relied on the interviewees' perspectives and opinions. Second, the study obtained information from a small group of specialists. Because of the small sample size, the true macroeconomic determinants affecting infrastructure financing in South Africa may not have been disclosed. Furthermore, the study did not take into account the perspectives of institutional investors that participated in infrastructure funding via the bond market.

The study's third limitation is the limited participation of mezzanine financiers in the research. The sample population's limited participation may have contributed to skewed perceptions of the actual situation. The fourth limitation is the lack of academic journals dedicated to the macroeconomic implications of infrastructure project finance. However, the researcher had access to extensive practitioner-based material to improve the understanding of the issue.

## 7.6 Suggestions for Future Research

Debt and equity financiers have different opinions of the macroeconomic factors affecting project financing decisions and risks associated with those factors. Detailed research could be conducted to identify the requirements of each of the above types of financiers and rank the factors according to their importance.

The study found that financiers, specifically commercial banks, can reduce their lending rates for sectors with good future potential and government backing. Based

on this finding, further research could be undertaken to identify the specific attributes that make a sector attractive to the financiers.

The concern about the rising debt-to-GDP ratio can be used as a proxy to assess the government's financial strength and ability to provide project guarantees. At the same time, the government has ambitious plans for infrastructure development that require some investment from the government. It would be worth identifying the potential implication of those plans on the debt-to-GDP ratio and *vice versa*.

## 7.7 Conclusion

This chapter summarises the main research findings and addresses the research objectives as described in Chapter 1. The study found that the macroeconomic factors applicable to the South African context are inflation, regulatory environment, political environment, currency convertibility and exchange rate, debt-to-GDP ratio, the capacity of the local manufacturing unit to meet the local content requirements, people's affordability, and interest rate. A finding of the research is that a long-term plan for infrastructure development and the political will to implement the plan can significantly attract the private sector to finance infrastructure projects. The research also identified the limitations applicable to it and the areas of future research. The research findings would assist the public sector in seeking to develop a more enabling environment for the private sector to participate in infrastructure financing.

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## Appendix 1: Discussion Guide/ Interview Questions

| Research Question | Interview Question |
|---|---|
| Research question 1: What measures can be implemented to maximise South Africa's macroeconomic strengths while minimising the risk posed by its weaknesses? | • From a financiers' perspective, what are the key challenges associated with infrastructure investment?<br>• What are the key macroeconomic factors that you assess or consider to decide on an investment?<br>• Do those factors vary from sector to sector (e.g., energy vs transport)? Do you expect the same level of return from every sector?<br>• Which of the macroeconomic factors are relevant only in South Africa?<br>• What are the most important macroeconomic factors in the South African context? |
| Research question 2: How do those factors influence project finance decisions? | • How do the identified factors influence your financing decisions? What are the must-fulfil macroeconomic criteria for accepting a financing application?<br>• What are investment risks associated with the key South African factors? At what phase of a project do they manifest?<br>• How do the country's macroeconomic environment (such as growing unemployment, high debt to GDP ratio) and credit rating influence your financing decision?<br>• What is the impact of COVID-19 on project financing decisions? What additional challenges do you foresee in investing in infrastructure in a post-covid world? |

| Research Question | Interview Question |
|---|---|
| Research question 3: What measures can be taken to leverage South Africa's positive factors and mitigate the risk emanating from the negative factors. | • Given the long-term nature of infrastructure investment, what macroeconomic risks or positive aspects do you anticipate manifesting in future?<br>• What are your strategies to leverage the positive factors and mitigate the risks?<br>• Are the measures taken by the government or regulatory bodies to mitigate the current and anticipated risks? How effective are those measures?<br>• What changes do you propose to augment those measures, or what measures should be taken to create a conducive environment for infrastructure financing? |

## Appendix 2: Research Participants

| Sl No | Name | Organisation | Domain |
|---|---|---|---|
| 1 | Aadil Cajee | Standard Bank | Debt Finance |
| 2 | Daniel Zinman | RMB | Debt Finance |
| 3 | David Calaca | Pembani- Remgro Investment Managers | Equity Finance |
| 4 | George Kotsovos | Standard Bank | Debt Finance |
| 5 | Hendrick Snyman | Gaia Fund Managers | Equity Finance |
| 6 | Jerry Chiang | Standard Bank | Debt Finance |
| 7 | Kwabena Malgas | RMB | Equity Finance |
| 8 | Li Yuan Zhang | (Advised not to disclose) | Debt Finance |
| 9 | Muhammed Munshi | Stanlib | Equity Finance |
| 10 | Nitesh Roopa | NedBank | Mezzanine/ Quasi-equity |
| 11 | Omid Alimia | Inspired Evolution | Equity Finance |
| 12 | Thulani Shange | ABSA | Debt Finance |
| 13 | Zak Ferreira | NedBank | Debt Finance |

# Appendix 3: List of Codes

| Key challenges associated with infrastructure investment |
|---|
| Regulatory environment |
| Contract Enforcement |
| Corruption |
| Lack of transparency |
| Unstable political environment |
| Lack of political will |
| Low market demand |
| Low commercial prospects |
| Long turnover time |
| Low return |
| Project sustainability |
| Lack of bankable projects |
| Lack of infrastructure privatisation |
| Lack of government guarantee |
| Unavailability of risk insurance |
| Lack of long-term planning/ vision |
| Policy uncertainty |
| Currency convertibility |
| Tax environment/ rate |
| Off-taker Credibility |
| |
| **Preference for brownfield or greenfield projects** |
| Greenfield |
| Brownfield |
| No Preference |
| |
| **Key macroeconomic factors** |
| Currency convertibility |
| Currency fluctuation/ exchange rate |
| Commercial risk insurance |
| Government subsidy |
| Govt guarantee |
| Political Risk insurance |
| Counterparty credibility |
| Corruptions |
| Legal framework |
| Regulatory environment |
| Contract enforcement |
| Debt to GDP Ratio |
| GDP growth |
| Inflation |
| Interest rate |
| Macroeconomic factors not important |
| People's affordability |
| Political environment |
| Credit rating |
| Sovereign credibility |
| Country specific factors |
| Market demand |
| Revenue line/ Cashflow |
| Off taker agreement |
| |
| **Sector-specific macroeconomic factors** |
| Same for all sectors / Universal framework |
| Depends on the project |
| Depends on the sector's importance |
| Power sector preferred |
| |
| **Macroeconomic factors relevant in South Africa** |
| Inflation |
| Regulatory Environment |
| Political Environment |
| Currency and exchange rate |
| Guarantee and Risk Insurance |
| Local manufacturing base |
| People's affordability |
| Interest rate |
| Macroeconomic factors not important |
| Demand & Revenue stream |
| Debt to GDP ratio |
| Job creation |
| Off taker Agreement |
| Credit rating |
| GDP Growth |
| Long term vision |
| Crime (Socio-economic environment) |
| Government credibility |
| Developed financial markets |
| High competition among banks |
| Infrastructure fund (availability of financial resources) |
| Investor confidence |
| Lack of opportunities |
| Market demand |
| Performance guarantee |

| |
|---|
| Strategic importance of the industry |
| Tax rate |
| Market liquidity |
| |
| **Investment risks in South Africa** |
| Construction risk |
| Exchange rate |
| Inflation |
| Off-taker's credibility |
| Law and regulations uncertainty |
| Political uncertainty |
| Government's financial status (debt to GDP ratio) |
| Interest rate |
| Operational risk |
| Red tape/ lengthy bureaucratic process |
| Technological risk |
| Commercial and market demand risk |
| Community risk |
| Drop in project performance |
| Environmental risk |
| No/low risk in South Africa |
| Safety and security of the project |
| Tax rate |
| |
| **Risk mitigation strategies** |
| Conservative financial forecasts to cover adversities |
| Strong offtake agreement |
| Avoid construction risks |
| Contractor's performance guarantee |
| Effective Risk allocation |
| Avoid new technologies |
| Commercial risk insurance |
| Continuous risk monitoring |
| Employing experienced O&M contractors |
| Engaging credible contractors |
| Employing experts/ technical advisors |
| Political risk insurance |
| |
| **Investment exit strategy** |
| No exit strategy |
| Strategy depends on the problem |
| Insurance and guarantees cover risks |
| |

| |
|---|
| **Impact of COVID** |
| Sector specific impact |
| Constrained government's fiscal space |
| No long-term impact |
| Decreased government's ability to pay guarantees |
| No impact of COVID |
| Shortage of foreign experts (movement restrictions) |
| Expensive risk insurance |
| Impacts project cashflow |
| Increased liquidity in the mining sector |
| Less business for the banks |
| Created secondary market opportunities |
| Increased project cost |
| Increased the need for infrastructure development |
| Project delay |
| Reduced investors' confidence |
| Restructure debt payment deals |
| |
| **Positive future aspects/ opportunities** |
| Implementation of effective policies and plans |
| Opportunity in the renewable energy sector |
| Availability of liquidity in the market |
| No major risk |
| Bankable project preparation initiative (supply of bankable projects) |
| GDP growth |
| Improved employment rate |
| Improved exchange rate |
| Infrastructure development push |
| Low interest rate |
| Privatisation of infrastructure |
| Rejuvenation of the construction sector |
| Sound monetary and fiscal policy |
| Young population- demographic dividend |
| |
| **Negative future aspects/ challenges** |
| Government's ability to provide guarantee |

| |
|---|
| Concentration risk |
| High oil price |
| Import challenges |
| Increased interest rate |
| Lack of bankable projects |
| Lack of capable construction companies |
| Lack of liquidity |
| |
| **Positive government measures** |
| Effective inflation targeting |
| Effective policies and plans for infrastructure development |
| Effective fiscal policy |
| Push for reform |
| ESKOM restructuring (splitting up) |
| Strong political will to reform |
| Support for PPP projects |
| Assisting construction companies |
| Effective measures to stabilise the exchange rate |
| |
| **Ineffective government measure** |
| Financial constraints (the ability of implement projects) |
| Ineffective political framework (corruption, populist agenda) |
| Limited political will (to implement reforms) |
| Slow progress of reform and policy implementation |
| No support for non-energy sectors |
| Increasing political risk |
| Lack of support for local manufacturing base (for solar panels and wind turbines) |
| Restrictive investment policy |
| |
| **Conducive investment environment** |
| Certainty in regulations |
| Currency convertibility and stable exchange rate |
| Efficient government planning |
| Fiscal prudence/ effective fiscal policy |
| Good relationship b/w private and public sectors |
| Political stability |

| |
|---|
| Right political rhetoric (investor confidence) |
| Sound political will to implement reforms |
| Reform in power sector |
| REIPPPP |
| Privatisation of infrastructure |
| Privatisation of SOEs |
| Improved labour laws |
| Loosen local content requirements |
| Reduce tax rate |
| Reduce the barriers of skilled immigration |
| Remove red tape |
| Simplify business establishment process |
| ESKOM monopoly (break to avoid concertation risk) |
| SANRAL monopoly (break to avoid concertation risk) |
| TRANSNET monopoly (break to avoid concertation risk) |
| Develop SEZs |
| Better law enforcement- safety and security |
| Right economic policies |
| Right legislative framework |
| Right regulatory environment |
| Sector specific program |
| Simplicity in development programs |
| Sound financial system |
| Sound regulatory environment |
| Stable economy |
| Supply of bankable projects |
| Transparency in dealings |
| Transport infrastructure |
| Upskilling local labour/ capacity building |