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EXPLORING THE CRITICAL SUCCESS FACTORS FOR THE FINANCING OF PUBLIC-PRIVATE PARTNERSHIPS IN THE ROADS AND TRANSPORT SECTOR: A CASE STUDY OF GAUTENG PROVINCE

A Dissertation

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By

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ABSTRACT

This research study identified the critical success factors for financing Public-Private Partnership (PPP) projects in the roads and transport sector at the provincial level in South Africa, with the aim of giving policy makers, academics and practitioners a glimpse of the existing conditions prevalent in the financing of PPPs. Transport and rail infrastructure are critical for trade as they contribute to the enhancement of inter-African trade initiatives and agreements. This study employed a thematic analytic approach to identify the critical success factors of financing PPPs within Gauteng province using four case studies, three of which were toll road concessions and the other a rail transport PPP. Overall, nine participants were interviewed from the public (project owners) and private sectors (concessionaire), with two participants coming from academia and National Treasury.

The findings on the critical success factors of financing transport infrastructure are consistent with international best practice. Specifically, the success factors identified include available financial markets, experienced and skilled private sector consortiums, value for money, government support, effective and efficient procurement processes, learning from others' experience, PPP finance structure and risk allocation.

The study's recommendations are that the public sector should select the best team for the job by ensuring that they select a private consortium with the necessary skills and experience. They also suggest that the public sector should be involved in the negotiation of funding, even in instances where the private partner is providing 100% of the capital funding. Another critical recommendation is to secure investment in training and development by the regulator, as this will ensure that the private and public sector officials involved in infrastructure development are well-versed on the legislative requirements and processes that are to be followed to successfully execute PPP projects. Procurement processes should also remain fair and competitive in all stages of the project development, including the operational phase. Lastly, in order to curb community protests, all relevant spheres of government should be actively involved to address the root causes of such protests.

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LIST OF ACRONYMS

Abbreviation	Meaning
DEFIC	Development Finance Centre
PPP	Public-Private Partnership
DBFO	Design Build Finance Operate
DBOM	Design Build Operate Maintain
BOOT	Build Own Operate Transfer
BLT	Build Lease and Transfer
DFO	Design Finance Operate
O&M	Operate and Maintain
NDP	South African National Development
GDP	Gross Domestic Product
SAICE	South African Institution of Civil Engineering
SANRAL	South African National Roads Agency SOC Ltd
EPMO	Enterprise Project Management Office
UK	United Kingdom
PFMA	Public Finance Management Act 1999
MSA	Municipal Systems Act of 2000
MFMA	Municipal Financial Management Act of 2003
US	United States
IMF	International Monetary Fund
USD	United States Dollar
UAE	United Arab Emirates
CSF	Critical Success Factors
MTR	Hong Kong Mass Transit Railway
GPG	Gauteng Provincial Government
DFI	Development Finance Institute
DBSA	Development Bank of Southern Africa
IIPSA	Infrastructure Investment Programme for South Africa
SADC	Southern African Development Community
SPV	Special Purpose Vehicle
RSA	Republic of South Africa

Chapter 1: Introduction

1.1 Introduction

The South African National Development Plan 2030 (NDP) (South African government, 2011) identifies infrastructure development (water, roads and transport, electricity, sanitation, schools, and health facilities) as a key enabler of sustained economic growth. One of the key objectives of the NDP is to address the backlog in infrastructure development caused by financial constraints, which have resulted in delayed, cancelled and abandoned PPP projects. The South African government's commitment that infrastructure development account for at least 10% of gross domestic product (GDP) cannot be realised without adequate financing, as well as an improvement in the existing financing strategies for PPPs in different stages of project development and implementation. Financial constraints explain in part why in the 2019 budget review, infrastructure's share of GDP averaged just 5.9% for the period between 1998/99 to 2017/18 (National Treasury, 2019). An investigation into the factors that lead to the successful financing of PPPs must be conducted if the country is to achieve its infrastructure development targets. This has the potential to offer alternative tools for improving financial management strategies in the PPPs.

PPPs involve the sharing of risks and responsibilities between the private and public sectors (Zhang, X., Cheung, E., Chan, A.P., Lam, P.T., Chan, D.W., & Ke, Y, 2012), where the private sector designs, finances, constructs and operates a public facility for a given period (Thomas, 2009). The public partner plays a supporting role, including offering a sound legislative and institutional framework. Mohamed (2010) pointed out that a key advantage of PPPs is that a partner with superior mitigation techniques can absorb risks within a project. Experiences globally (China, Canada, Western Europe and Australia) show that armed with the right financing strategy, PPPs are a quicker option to address an infrastructure development backlog (Li et al., 2005; Jefferies, 2006; Jacobson & Choi, 2008; Osei-Kyei, R., & Chan, 2017; Arimoro, 2018). Since the early 1990s, developed countries have worked with the private sector on public infrastructure development (Cuttaree & Mandri-Perrott, 2011. Based on the successes of PPPs in the developed world, in recent years a significant number of developing countries have been making progress with such policy implementation, however most are yet to explore the full opportunities and benefits of the PPP model (Sanni & Hashim, 2014). Factors such as political instability, corruption, inadequate skills and poorly developed financial

markets have slowed the PPP development terrain in Africa, in particular (Osei-Kyei & Chan, 2017).

PPPs occur at different levels. High-profile roads and transport projects include the Lekki toll road concession project (Nigeria), the N4 toll road (South Africa/Mozambique) and the Port of Maputo (Mozambique) (Brocklebank, 2014; Global Infrastructure Hub, 2020). In these projects, the relevant governments provided support both politically and financially in varying forms to ensure project sustainability and resilience. For example, the Lekki toll road project largely raised funding from local banks and institutions, which reduced the foreign currency and inflation risk (Brocklebank, 2014). For the N4 toll road, the South African and Mozambican governments provided the concessionaire with a debt guarantee (Global Infrastructure Hub, 2020), while the Port of Maputo was built when the Mozambican government utilised an international private consortium with extensive experience in managing ports.

The National Treasury (2017) budget review revealed that of the 31 PPPs concluded between 1998 to 2017, five were in the roads and transport sector, which was inadequate to deal with the country's infrastructure development needs and backlog. The financial challenges were mainly caused by sluggish economic growth; the inability of government to attract and unlock private capital and to ensure efficient financial management practices are implemented and adhered to. Challenges faced in the sector must be investigated and continuously adapted based on past experiences.

The South African Institution of Civil Engineering (SAICE), in its infrastructure report card of 2017, gave the overall condition of South African infrastructure a rating of D+ (at risk of failure), which was mainly due to poor maintenance or a lack thereof, and insufficient engineering capacity. The categories of infrastructure that were assessed were water, sanitation, solid waste management, roads, airports, ports, railways, electricity, healthcare and education. Road infrastructure was assessed in five categories, national roads were rated B (fit for the future); paved provincial roads were rated D; paved metropolitan roads were rated C- (satisfactory for now); paved municipal roads were rated D-; and provincial, metropolitan and municipal gravel roads were classified as unfit for purpose (E). The main contributing factors to the poor roads and transport infrastructure were identified as poor maintenance; overloading; a skills shortage; and a failure to attract enough private capital and financing to successfully maintain and support infrastructure through a PPP model.

An injection of R137 billion into infrastructure improvement and development (Department of Transport Strategic Plan of 2020/21 to 2024/25) highlighted the Department of Transport's commitment over the Medium Term Expenditure Framework (MTEF) to raise adequate financial resources and capital to invest in infrastructure development. Moreover, the South African government, through the South African National Roads Agency (SANRAL), has committed to improve its footprint to support provinces and municipalities in a new institutional arrangement in the form of an Enterprise Project Management Office (EPMO) (Department of Transport Strategic Plan of 2020/21 to 2024/25). The aim is to support entities and develop a repository of project management expertise. As part of the effort to support the accountable and efficient use of financial resources in PPPs, the critical success factors for financing them must be explored. It is for this reason that this study investigated which factors are necessary to successfully finance PPPs in the roads and transport sector in South Africa at the provincial level.

1.2 Research problem

South Africa's roads and transport infrastructure is regarded as the most developed in Sub-Saharan Africa, however there is poor maintenance at the provincial and municipal level; SAICE (2017) graded most of the country's provincial, metropolitan and municipal roads as being "at risk of failure". Although South Africa has a strong, transparent, regulatory PPP framework that manages risks, few projects are concluded, while several are delayed or cancelled. The National Treasury (2019) shows that new PPP transactions declined from an estimated value of R10.7 billion in 2011/12 to R4.8 billion in the 2017/18 financial year. Improving financing strategies for PPPs in this sector cannot be postponed any further if infrastructure development and maintenance is to be met and the backlogs addressed. An investigation into the critical success factors of financing PPPs is one way to devise and adopt new sustainable strategies. PPPs are also frequently subjected to renegotiations, which occur because of "compensation events" that change the financial conditions of the concession Sarmento & Renneboog (2016). The prevalent high rate of renegotiations in these projects undermines the outcomes of the initial bids, thereby imposing an additional burden on the public purse. Moreover, many projects are characterised by poor performance and a low quality of service (Guasch, Laffont & Straub ., (2003); Guasch, Laffont & Straub (2006); Bitran et al., 2013). Studies on PPP projects in the roads and transport sector have shown that few focus on how PPPs are structured and financed. For this reason, this study sought to investigate the

experiences in financing of PPPs in the roads and transport sector in South Africa on a provincial level. Specifically, this research sought to answer the following question:

- What are the critical success factors for financing PPP projects in the roads and transport sector at the provincial level?

1.3 Research objectives

The objective of this study was to investigate the critical success factors for the financing of PPP projects in the roads and transport sector at a provincial level in South Africa. The specific objective is given below:

- To explore the critical success factors for financing PPPs in the roads and transport sector in Gauteng province.

1.4 Justification for the study

This study investigates the critical success factors for financing PPP projects in the roads and transport sector at a provincial level in South Africa. Studying these factors is important as it will help policy makers, academics and practitioners understand the financing mechanisms and challenges of PPP projects in the roads and transport sector.

In addition, the study findings could be used to find the best financing practices for PPPs in South Africa, and practitioners are likely to benefit by using the findings as tools and guidelines to adopt and use in managing financial aspects of their PPP projects. Finally, the findings will be useful in informing future studies that seek to improve the way PPPs are financed, thus adding to the body of knowledge and science.

1.5 Organisation of the study

This study is comprised of five chapters, with the first providing background and context, as well as the research problem, objectives and justification for the study. The second chapter reviews extant literature on PPPs and outlines the conceptual framework of the study. The research methods and techniques used in the data collection are presented in Chapter 3, which also includes the ethical guidelines followed. The fourth chapter presents the findings and discusses those, while the last chapter provides conclusions and recommendations.

Chapter 2: Literature review

2.1 Introduction

This section reviews extant literature on PPPs, focusing on definitions of key terms, critical success factors, and legislation.

2.2 Definition of key terms

Public Private Partnerships (PPPs): refers to a partnership between the public and private sector to pursue long-term contractual agreements that involve high capital costs, long term contracts and risk-sharing (New South Wales Parliament, 2006). Ke et al. (2010) defined PPPs as the sharing of risks and responsibilities between the government and a public partner, while the National Treasury's (2005) regulation 16 defines PPPs as: "a commercial transaction between an institution and private party where the private party (a) performs an institutional function on behalf of the institution; and / or (b) acquires the use of state property for its own commercial purposes; and (c) assumes substantial financial, technical and operational risks in connection with the performance of the institutional function and/or use of state property; and (d) receives a benefit for performing the institutional function or from utilising the state property". In this study, PPP is defined as a commercial arrangement where an institutional function of the government is performed by the private sector, where risk is allocated to the party best suited to mitigate it, in order to improve infrastructure networks towards enhancing service delivery.

Critical Success Factors: According to Rockart (1982), critical success factors (CSFs) are "a few key areas of activity where favourable results are necessary for a manager to reach desired or predetermined goals", while Chittithaworn;Islam;Keawchana & Hasliza (2011) defined success as the achievement of goals and objectives in different sectors of human life. This definition shows that success factors are conditions or pre-requisites for the successful implementation of projects. In this study, critical success factors are defined as the fundamental attributes and activities that guarantee the success of PPPs.

Financing: "Financing is the process of providing funds for business activities, making purchases, or investing" (Hayes; 2021). The United Nation's Economic and Social Commission for Asia and the Pacific (2021) defines financing as being where lenders use investment cash flow for repayment, and there is no recourse to either equity sponsors or the public sector to make up any shortfall.

Financial practices: These are a "set of common systems or standard operating procedures that are developed to carry out accounting, financial reporting, budgeting and other activities related to business finances" (Lohrey, 2021). This definition was adopted for this study.

2.3 Overview of public-private partnerships

PPPs are schemes used by governments to promote development in different sectors of an economy. Skietrys et al. *(*2008) explained that PPPs involve utilising the private sector's skill and management expertise to deliver public infrastructure projects, while Akintoye et al. (2003) noted that PPPs provide an effective way of delivering "value for money" in public infrastructure development. This is achieved through competitive tendering, flexible negotiations and risk allocation between parties. In PPPs, risk sharing and allocation among parties is the key significant distinguishing factor (Ke et al., 2010). The PPP model is used by governments to reduce service delivery overloads while they focus on infrastructure growth and development (Cumming, 2007). Contrary to other procurement methods, in PPPs, risks are carefully assessed and allocated to the partner that is best able to mitigate such risks (Li et al., 2005). The relationship between the public entity and private consortium is a long-term one, thus a stable and enduring relationship is a requirement for the effective operation of PPPs (Middleton, 2000). Furthermore, in this arrangement, parties to the contract bring some material or non-material resources to the partnership (Akintoye et al., 2003).

PPPs began to be used in the early 19th century, however a spectrum of PPP models has been widely implemented since. Common PPP models will be discussed in the upcoming sections.

2.3.1. Design Build Finance Operate (DBFO)

Design: Fontan Architecture (2021) stated there are five design phases in a construction project, which includes pre-design. The pre-design phase is mainly comprised of a feasibility study, which includes site analysis, zoning, project scope and budgeting. The first phase is the schematic design, which largely entails discussions with the client to determine the scope and size of the project. The next phase is the design development, which includes details of how the interior and exterior will look, including finishes. The third stage involves the preparation of the construction procurement documents followed by the bidding process.

Build: This phase involves the construction and development of an infrastructure project to make it operational (Gatti, 2008).

Finance: In the DBFO model the finance aspect relates to project finance, which requires the creation of a special purpose vehicle with limited or non-recourse funding, and the cash flows of the project are ring-fenced for the duration of the project (Gatti, 2008).

Operate: The operate stage in a DBFO entails the operation of the project, which generates cash inflows to repay the debt financing and provide a return on investment to equity partners (Gatti, 2008).

DBFO is also described as a model of procurement, where the private partner does not have an obligation to hand over the asset to the public administration at the end of the term (Ismail, Mabuza, Pillay & Xolo, 2014). Gatti (2008) noted that the model is widely used in Private Finance Initiatives in the UK, which mainly entail the public sector being a buyer of the service related to a specific project. This is the most utilised method in emerging markets, with an average concession period of 30 years (Osei-Kyei & Chan, 2015).

2.3.2. Design Build Operate Maintain (DBOM)

The DBOM model is similar to the DBFO model, but includes the private partner maintaining the project. This entails the servicing and upkeep of the project to ensure that it remains operational at an optimal level. Babatunde, Perera, Udeaja and Zhou (2014) found that DBOM is commonly utilised in the development of infrastructure projects such as transport, water, sewage, education, wastewater, hospital and defence developments across Europe, South America, Asia and Sub-Saharan Africa.

2.3.3. Build Own Operate Transfer (BOOT)

In the BOOT model, the private party owns the infrastructure asset and transfers it after a predetermined period to the public partner at an agreed upon price (Gatti, 2008). Its similarity with the DBFO model resides only with the build and operate stages of the project, as discussed in Section 2.3.1. A BOOT model is most commonly utilised in water, sewerage, wastewater, education, hospitals and defence projects (Babatunde, Perera, Udeaja & Zhou, 2014).

2.3.4 Build Lease and Transfer (BLT)

In the BLT model, the private party builds (which includes financing) the project, then leases it out to the public partner for a predetermined period, thereafter transferring the asset at an agreed upon amount at the end of the lease period (Ismail, Mabuza, Pillay & Xolo, 2014). The BLT model is most commonly used in transport, prisons and energy infrastructure projects (Babatunde, Perera, Udeaja & Zhou, 2014).

2.3.5. Operate and Maintain (O&M)

O&M is a service contract that is entered into by the public sector, where it procures the services of the private sector to operate and maintain its assets, and bears the financial risks associated with the project (Ismail, Mabuza, Pillay & Xolo, 2014).

Abdel Aziz (2007) noted that PPP structures vary depending on the objectives, motives and location. The above models have been extensively utilised in different economic settings, in particular, in developed countries (Osei-Kyei & Chan, 2015).

2.4 PPPs in South Africa

The South African government is committed to partnering with the private sector to address the infrastructure backlog, particularly when it comes to the maintenance of national and provincial road networks and the integration of public transport networks. Examples include the Infrastructure South Africa Project Preparation Round Table, held in November 2020, where President Cyril Ramaphosa highlighted the need for a credible project pipeline (South African Government, 2020). The establishment of an infrastructure fund is another sign of government's commitment to improve infrastructure development and offset the backlog. The PPP model is among the most preferred by the government. In South Africa, PPPs refer to a registered and approved contract between a national, provincial and local government institution in which the private party performs an institutional function (National Treasury, 2004). In PPPs, the government permits the private party to use state property for certain project specifications. In principle, PPPs are meant to be used in a situation where significant financial, technical and operational risks are absorbed by the private party.

The South African government is committed to supporting the growth of the PPP sector, which is regularly promoted as reflected in annual policy documents, budgets, and presidential speeches. The government views this as an integral part of the nation's strategy to grow social

services and infrastructure. Several PPP projects have been concluded in different sectors including roads and transport, water and sanitation, hospitals, education, housing, healthcare, tourism, social development, correctional services, and railways. Inkosi Albert Luthuli Hospital (National Treasury, 2007) and the Gautrain Rapid Rail Link are two such projects, where in the latter, the private party was responsible for the design, construction, operation and maintenance of the public rail transportation system (Gauteng Management Agency, 2015). Other flagship PPP projects include Eastern Cape Provincial Government Fleet Management, the Western Cape Rehabilitation Centre, Lentegeur Hospital, and the renal dialysis services at Polokwane and Settlers hospitals. A high-profile roads and transport project that was successfully implemented through a PPP was the N4 toll road (South Africa/Mozambique) (Brocklebank, 2014; Global Infrastructure Hub, 2020), where the government provided political and financial support through the provision of a debt guarantee to the private party (Global Infrastructure Hub, 2020).

World Bank statistics show that South Africa was leading in infrastructure in the period between 1999 and 2003 (Thomson, 2005), however like most developing countries, South Africa is only on its first step of the PPP maturity ladder. Deloitte and Touche (2006) described PPPs in South Africa as a market that is developing. South Africa manages its processes for assessing and establishing PPPs similar to countries like Canada, the Netherlands and the United Kingdom. The South African National Treasury is responsible for the process and has a dedicated PPP unit (IBRD, 2013:) that manages and provides oversight over the legislative processes at the local, provincial and national levels. The unit assesses and approves PPPs, while also providing continuous support to the private and public parties for the duration of each project. This ensures accessibility, value for money and suitable risk transfer in the PPP cycle from inception to exit (National Treasury Regulation 16, 2004). Despite these provisions, however, challenges in successfully financing PPPs still exist, as evidenced by delays, overcharging and cancelled projects. Common PPP models used in South Africa include Design Finance Build Operate Transfer (DFBOT), Design Finance Operate (DFO) and Design Build Operate Transfer (DBOT), as well as equity partnerships (National Treasury, 20017).

An additional concern is that legislative challenges exist in the Acts that govern financial management practices in PPP, such as the Public Finance Management Act of 1999 (PFMA), Treasury Regulation 16 of 2004, and the Municipal Systems Act of 2000 (the MSA). This problem is more pronounced at the provincial and local municipality levels. For example, the

Municipal Financial Management Act of 2003 (MFMA) underlines the need for transparency and accountability in procurement, yet there are no functional mechanisms in place to ensure that strong PPP legislation is properly interpreted, understood and implemented (Fombad ,2012). Thus the laws that are meant to regulate and achieve best financial management practices are at times contradictory and require careful interpretation. Both the MFMA (2003) and MSA (2000) require feasibility studies before a municipality forms a PPP, for example.

2.5 Life cycle of PPPs

The implementation process of PPPs in South Africa is comprised of six phases, as explained by the National Treasury (2004) (Figure 2.1 depicts the phases in a diagrammatic flow). The first phase is the inception of the project, where a transaction advisor and project owner are appointed and the project is registered with the National Treasury. The next phase occurs when a feasibility study is conducted, which includes due diligence, value assessment, economic valuation, a procurement plan, and an option and needs analysis. The third phase involves procurement, which mainly entails the preparation of the procurement documents and the subsequent appointment of the winning bidder, with two sub-stages that require the public sector to submit specific documents for National Treasury approval. The last three phases are development, delivery and exit. For the purposes of this study, the phases of a PPP as discussed above are utilised.

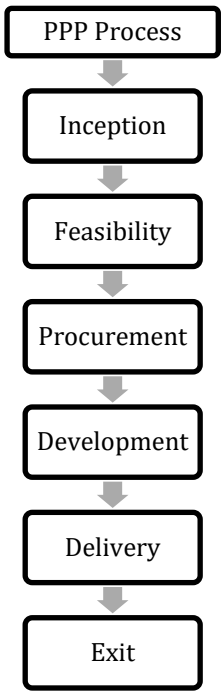

Figure 2.1: Stages of a PPP (National Treasury, 2004)

2.6 PPP financing

Globally, PPPs have enabled governments to improve on service delivery and reach a wide populace through sectors such as education, water and sanitation, roads and transport, and energy (Pongsiri, 2002; Yong, 2010). The world's current and future infrastructure demands are proving difficult to achieve for most governments, as prevailing fiscal constraints hinder funding for infrastructure development. Since the 2008 recession, banks – mainly in advanced economies – have scaled down on balance sheet lending. Institutional investors such as Pension funds have however taken a keen interest in investing in PPP's, as the investment is long term in nature and thus matches the long term nature of assets that they hold on behalf of their clients.

2.6.1 Financing of PPPs in Germany

In Germany, PPPs are characterised by a holistic life cycle approach, which includes one-stop planning, construction, financing, operations and utilisation by a private partner (Daube & Vollrath, 2006). Of these, financing is the main service delivered by the private partner to the public sector. Germany has two basic forms of PPP project financing, namely, project finance and non-recourse forfeiting of instalments (Daube, Vollrath, & Alfen, 2008). Project finance

is the typical financing model used in the international PPP market, which takes place when the project financing is based on the cash flow emanating from the project.

Germany also has a special form of financing called non-recourse forfeiting of instalments. In this arrangement, the private partner sells receivables emanating from the service contract with the public sector to a bank (Daube, Vollrath, & Alfen, 2008), while the public principal waives any objection to the sold receivables against the bank. When choosing between the two models, there are multiple legal variations that are specifically suited to the requirements of a project (Jacob, Kochendörfer, von Drygalski, & Hilbig, 2014). Practices and subsequent operational structures, including finance, are adaptable to the project a hand. The financing structure used depends on the project size, the risk allocation predetermined by the public partner, and the legal framework of the specific project. Between 2002 and 2021, the non-recourse forfeiting of instalments was the most commonly used financing model among real estate projects, with an estimated value of €600 million (Daube & Vollrath, 2006). Unlike in international practice, Germany uses project finance in fewer projects.

2.6.2 PPP financing in China

PPPs have played a crucial role in Chinese infrastructure development in recent years, with state-owned entities being the public partner in most PPP projects. The Chinese Ministry of Finance (2017) reported that of 572 national demonstration projects, partnerships with state-owned enterprises constituted over two-thirds of all contracts (Chong & Poole, 2014). The preference for state-owned enterprise partnerships over private entities is due to the uncertainty and risks of continuity of projects. Commonly, most partnerships with private partners do not last the long-term basis arrangement for PPP projects in China, thus the collaboration with the state-owned entities offsets this uncertainty with the private sector and benefits from the relative stability in the state entities. The experience of PPPs in China shows how the state failed to attract enough private investment, with the government incurring significant financial risks as the main guarantee and project financier.

Although the central government provides funding, the responsibility for the implementation and financing of infrastructure projects rests primarily with local authorities. To raise funds, local governments make extensive use of ‘off-budget’ financing options (Chong & Poole, 2014). This includes selling land-use rights and borrowing through local government financing vehicles (LGFVs). Local governments generally cannot borrow directly from capital markets,

and in the operational revenue sharing arrangements (central government, local governments), they do not have the power to levy the taxes needed to enhance service] delivery. For this reason, there are large numbers of LGFVs in China – between 6,500 and 9,800 in total. In most cases, LGFVs are wholly owned by local governments, while some trade on the stock exchange (Chong & Poole, 2014)

2.6.3 Financing: Sub Saharan Africa

In Sub-Saharan Africa, PPPs are still at the infancy stage, with the exception of South Africa. Several challenges and constraints limit the continent from drawing equal benefits from PPPs' project financing (Sanni, & Hashim, 2014; World Bank, 2015). Most Sub-Saharan countries that have attempted PPPs have struggled to draw on long-term local and foreign currency financing for infrastructure development. Low or sometimes non-existent sovereign credit ratings also limit the public sector's ability to raise capital from private investors and or the capital markets . Countries such as Cameroon, Côte d'Ivoire, Ghana, Kenya and Nigeria do not have an investment-grade foreign currency long-term sovereign debt ratings (Shendy, Kaplan & Mousley, 2011). As they are considered high-risk, local long-term resource financial markets have limited capacity to finance infrastructure projects. Moreover, infrastructure projects require substantial credit enhancement for long-term debt. Other challenges are the longer payback and build-out periods, which expose political and regulatory interference as well as corruption (Loxley, 2013; Osei–Kyei, & Chan, 2016).

Most PPP projects implemented in Africa have typically been small compared to other regions, and most are financed entirely with equity. This is why projects with quicker turnaround, shorter-term debt, limited regulatory intervention and those with US dollar revenues (such as export-oriented ports and railways, and gas pipelines) are preferred over projects with domestic revenue flows that require long-term financing (Sheppard, Von Klaudy & Kumar (2006)).

2.7 Financing options

The initial cost of financing infrastructure construction works and the payment for the services provided take many forms. On one hand, there is public procurement, where the government utilises its own finances and property, while on the other there is private infrastructure investment, where the private sector owns and finances the property. In between these options, different types of PPPs are deployed, and the risks are transferred to varying degrees between public and private partners (Chong & Poole, 2013). Infrastructure services are paid by the

government to cover private financing costs over the life of the asset. This can be done either through a budget transfer from the government, or user fees such as tolls.

2.7.1 Public financing

Public financing takes different forms, such as general budget appropriations where infrastructure projects are financed through tax revenues or government debt (Chan, Forwood, Roper, & Sayers, 2009). Revenue bonds are tied to specific infrastructure projects by a government through state-owned entities and national development banks (NDBs) (Chong & Poole, 2013; Regan, 2017). In the developing world, concessional and/or non-concessional financing options are available from multilateral development banks (MDBs), such as the IMF and the World Bank (Prizzon, 2017). Public financing of infrastructure through a budget appropriation process is the most common approach in emerging economies (Chong & Poole, 2013). In public financing, budget appropriation presents higher levels of transparency and public scrutiny compared with other government financing vehicles. This ensures greater accountability over public expenditure, and there is also a lower cost for government debt compared with the private sector. On the contrary, public financing limits infrastructure investments due to budgetary constraints on the fiscus, fiscal regulations (e.g., debt or deficit limits), and political influence.. Privatisation of existing government assets is another form of public financing for new infrastructure projects (Reserve Bank of Australia, 1997), however a strong regulatory framework should be put in place in cases where a natural monopoly is being privatised.

2.7.2 Private financing and PPPs

Private financing comes in two forms – debt and equity. Debt constitutes a large proportion of infrastructure financing, which usually depends on the stability and predictability of income flows. Debt funding has reached up to 90% of total funding for PPP social infrastructure in the UK where government payments for infrastructure services are stable and predictable" (Chong et al., 2013). These include private telecommunications networks commissioned by a government, but which are at least partly financed by the private sector (Chong & Poole, 2013).

Diaspora bonds are another option available to many sub-Saharan African countries (Kodongo, 2013; Rustomjee, 2018). Those countries with large diaspora populations can utilise this option to obtain a favourable debt rating. Diaspora bonds are long-term debt securities that a government or government agency issues that are specifically targeted to the country's diaspora

population, which uses the flow of exports or remittances as collateral. Its main advantage is that it is redeemable only at maturity, thus providing more security for investors Countries such as China and Japan utilised this option as early as the 1930s to borrow from international capital markets, multilateral finance institutions and/or through bilateral arrangements with other governments (Kodongo, 2013). Although, this market is not mature in Africa, Ethiopia and Ghana have used diaspora bonds. Shimeles (2010) stated that approximately US$10 billion can be raised annually through diaspora bonds. Moreover, the African Development Bank (2013) estimated that about 140 million Africans living outside the continent have migrant savings of more than US$53 billion. The major impediment to this source of finance is public resource misappropriation and the absence of accountability in many countries on the African continent.

Infrastructure bonds are another form of infrastructure development financing, which are issued to raise capital for a specific stand-alone project. Bond repayment comes from project cash flows, with performance being subject to a project's associated risks (Mezui & Hundal, 2013). In sub-Saharan Africa, South Africa and Kenya have selected this option, for example Kenya issued bonds in 2009 to raise funds for roads, energy, water, irrigation, and sanitation projects. There are also other financing options that include loan guarantees and lines of credit provided by governments to private sector developers; these act as revenues if a project suffers cash flow challenges.

2.8 Conceptual framework: Critical success factors of financing PPP

Since the inception of PPPs, several researchers have studied critical success factors (CSFs) to enhance their understanding of the ways in which PPP policies can be successfully implemented for infrastructure development (Liu et al., 2014). Critical success factors for PPPs have been applied and tested at in different countries, models chosen, and stages in the PPP process, and are commonly used as a tool to assess the success of PPPs in different stages of project development and implementation. For instance, critical success factors were assessed for general PPP infrastructure development (Cheung *et al.*, 2012; Hwang *et al.*, 2013; Osei-Kyei, & Chan, 2015)at the feasibility stage (Ng *et al.*, 2012); briefing stages (Tang, 2012) and initial design stages (Raisbeck & Tang, 2013). Despite a wide range of coverage of success factors by these studies, they vary and are area specific, and the order of importance also differs.

2.8.1. Available financial markets

The stability of the financial sector of a country dictates the success of its infrastructure funding. To achieve stability, a country's financial system must be in sync with the sustainable developmental role of the country through effective regulation (Guterres, 2018). Governments thus have a duty to monitor and regulate their financial systems to effectively support their national development projects (European Commission, 2017). The South African financial markets are positively focused for infrastructure development, which is credited to their strong regulatory and legal frameworks (Young, 2013). Further, a country's macro-economic outlook must be favourable, i.e., there must be manageable inflation levels, economic policy certainty, political stability, and efficient financial markets.

2.8.2 Appropriate risk allocation

Appropriate risk allocation means identifying risks and insuring against those which may affect the project under consideration (Dada & Oladokun, 2008). Insurance could come in the form of insurance cover, shareholder agreements, government guarantees, loan agreements and supply agreements (Dada & Oladokun, 2008). Regarding PPPs, parties share the risks through contractual agreements (Botlhale, 2016), in which they admit to the possibility of the project failing (Joynes, 2019). Risks are normally high at the early development stage of a project, hence the need for developing effective risk mitigation strategies (Oberholzer, Schneider-Roos, Boulanger & Van Staden, 2018:4).

2.8.3 Strong private consortiums

A strong consortium is another critical success factor for financing infrastructure development; having the required management competence and expertise relating to the project or infrastructure is critical in PPPs (Chan et al., 2010; European Network on Debt and Development, 2017).

2.8.4 Value for money

It has been noted that a public sector comparative in the feasibility stage of a PPP should be developed when public funds are available, and when not available, the cost of not delivering the service should be utilised to ascertain whether the PPP would be more cost effective and economical (Emek, 2015).

Moreover, infrastructure or the project in question must have economic viability (Geroniks & Legnieks, 2015; Schoenmaker, 2018). In other words, the infrastructure being developed must be able to generate long-term cash flows, be profitable over time, and must be characterised by minimal competition.

2.8.5. Legal framework and government support

In Section 2.4 it was found that South Africa has a good legal and policy framework, which creates a sound environment for the successful implementation of PPP projects.

2.8.6 Competitive procurement process

Another key factor is a competitive procurement process; a lack of competitiveness in the procurement process results in corruption due to the overpricing of inputs and materials (Chan et al., 2010).

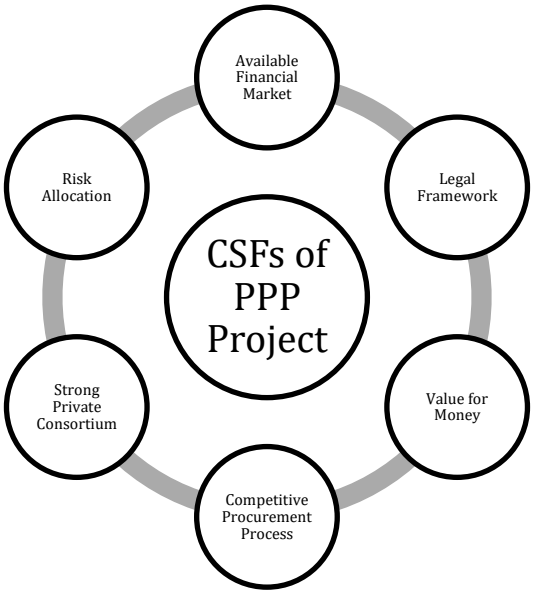

Figure 2.2: Conceptual framework of successfully financing a PPP project (Author's own)

2.9 Empirical literature: Critical success factors for financing PPPs

2.9.1. Available financial markets

A study was performed in Nigeria that identified the CSFs in infrastructure delivery, three of which were a stable macroeconomic environment, sound economic policy, and availability of

a suitable financial market (Babatunde, Opawole & Akinsiku, 2017). Another study performed in the UAE looked at CSFs in transitional economies by comparing the CSFs identified in the UAE versus those identified in the UK (Almarri & Abu-Hijleh, 2017). The study found that having an active and efficient local financial market enhanced the ability for capital to be raised to meet the project requirements. The macro-economic conditions of a country, specifically economic growth, GDP, inflation, interest rate and unemployment rate, were ranked second, and are also critical conditions that enhance a project's feasibility. Moreover, Osei-Kyei and Chan (2017) compared success factors in Ghana and Hong Kong, revealing that the socio-political and economic environments are critical in Ghana, while the organisational environment and relationships are more important in Hong Kong. Muhammad and Johar (2018), in a study of the housing sector in Nigeria and Malaysia, identified that the availability of a financial market is a CSF in Nigeria. The study further classified 19 CSFs, which were divided into five categories, one of which was a favourable investment environment. This highlights the importance of an active financial market.

In Mainland China available financial markets were listed as one of the top five CSFs, however in Hong Kong it did not feature in the top five. Hong Kong is viewed as the gateway to China and many international organisations prefer to have their offices based there, hence there is no shortage of opportunities in its financial markets (Cheung, Chan, Lam & Ke (2012)). A study in South Africa analysed the CSF of PPPs in infrastructure development also utilised open-ended questions, which highlighted the importance of job creation and counter-trade agreements on projects beyond a certain financial threshold in instances where the project is cross border in nature (Maseko, 2014). It is thus evident that the availability of active financial markets is a common theme.

Li et al. (2005) identified poor financial markets as an economic risk factor that can be best managed by the private sector, based on companies' experience in utilising various project financing techniques. A depreciation in the local currency impacted the economic viability of the Lekki Toll Road PPP project in Nigeria, for example (Osei-Kyei & Chan, 2015).

2.9.2 Appropriate risk allocation

The critical nature of having equitable and appropriate risk allocation was found in various studies (Cheung, Chan, Lam, Chan & Ke, 2012; Babatunde, Opawole & Akinsiku, 2017; Muhammad & Johar, 2018; Almarri & Abu-Hijleh, 2017).

2.9.3 Strong private consortiums

Cheung, Chan, Lam and Ke (2012) identified the need for a strong private consortium as a common CSF in a study on Hong Kong and Mainland China. Similarly, a South African study was conducted on CSF in infrastructure development, which identified the key CSFs as being a sound technical and financial feasibility study, strong contract management controls, and an experienced private consortium that has the necessary technical strength (Maseko, 2014). It further highlighted that there are significant salary disparities between the public and private sectors, which hinders the ability of the public sector to attract and retain talent. It is thus evident that the public sector, when embarking on a PPP, will need to ensure that a private partner with the necessary technical experience is chosen to ensure the success of the project.

2.9.4 Value for money

Emek (2015) found in a study conducted in Turkey that demand forecasts are not adequately prepared, so the public partner ends up carrying more financial risk than the private partner through government guarantees and foreign currency and inflation risk. It was also found in other studies that a detailed and thorough cost benefits assessment is a CSF (Almarri & Abu-Hijleh, 2017; Babatunde, Opawole & Akinsiku, 2017).

Osei-Kyei, Chan and Ameyaw (2016) studied the CSFs in operational management in infrastructure projects, identifying five factor groupings. A simplified payment mechanism and consistent project monitoring were ranked first, with sub-factors being an acceptable level of user fee charges and an efficient and well-structured payment mechanism. Proficient service delivery and an adequate legal structure was ranked second, with two of its sub-factors being transparency and financial accountability. Effective contract variation management was ranked fifth, with the streamlining of the approval process to large contract variations being highlighted as critical, as the ineffective management thereof may result in project budget overruns. Muhammad and Johar (2018) identified the issue of developers having profit sharing accountability as a CSF, which falls within the category of a sound financial package. A further CSF is the public sector having good negotiation skills to ensure they enter into a favourable contract with the private sector that is both financially feasible and economical.

Grimsey and Lewis (2007) identified that the procurement process of PPPs comes at a significant cost and can run into the millions when one considers the length of time it takes to conclude a PPP contract, as well as the use of professional services in the preparation of legal

and due diligence reports. Gatti (2008) identified that financing a project through a newly incorporated entity (Special Purpose Vehicle), which is what most PPP models entail, tends to be a drawback as it is more costly than corporate financing. This is because of high transaction costs which can amount to between 5% and 10% of the total cost of investment. This is mainly due to the length of time that technical, legal, insurance and loan arrangers require to evaluate and structure a deal, and the cost of supervising a project is high.

Hong Kong Mass Transit Railway (MTR) manages and operates subways within Beijing's railway network (Liu & Wilkinson, 2013). Their revenue model initially relied on ticket sales and advertisements; however, the government implemented a policy reducing the cost of utilising rail as a form of transportation to encourage citizens to use rail instead of road to alleviate traffic, which resulted in ticket selling prices being unprofitable for MTR. The government then negotiated with the operator that it would subsidise ticket sales over a three-year period in instances when their profits came below the expected/projected amount.

The failures identified by Osei-Kyei and Chan (2015) were that in the Lekki Toll Road (Nigeria), there was insufficient public consultation with regards to the affordability of toll fees, and further, the procurement process was not competitive, hence cost effectiveness could not be ascertained. For the Port of Maputo (Mozambique) project, there were tensions amongst importers and exporters regarding the taxes that were being charged. In Malaysia, the high charges for direct users were found to be a constraint (Ismail & Haris, 2014).

Babatunde, Perera, Udeaja and Zhou (2014) found that public resistance in Nigeria was one of the most problematic factors at the implementation or construction phase of a PPP project. It is thus evident that the financing mechanisms in user pay revenue models should be negotiated openly with all impacted stakeholders to ensure the financial sustainability of PPP projects.

2.9.5. Legal framework and government support

A review of CSFs in numerous studies also identified that a good legal framework is critical to ensure the success of PPP projects (Babatunde, Opawole & Akinsiku, 2017; Almarri & Abu-Hijleh, 2017; Osei-Kyei & Chan, 2017). Good governance, political support, and the provision of government guarantees were further found to be CSFs in the implementation of infrastructure projects in both developed and emerging markets (Cheung, Chan, Lam, Chan &

Ke, 2012; Babatunde, Opawole & Akinsiku, 2017; Almarri & Abu-Hijleh, 2017; Muhammad & Johar, 2018).

2.9.6 Competitive procurement process

A transparent and efficient procurement process was found to be critical in studies on mainland China and Nigeria (Cheung, Chan, Lam, Chan & Ke, 2012; Babatunde, Opawole & Akinsiku, 2017). Grimsey and Lewis (2007) found that the average time to procure PPP projects in Australia took up to 18 months, whilst it took up to 22 months in the UK. This was mainly due to the time it took for the negotiation of payment terms, due diligence, and deciding on which party certain risks should be allocated to. One of the most prevalent challenges in the development phase in Nigeria was found to be scheduled delays by administrative procedures, which increased the length of time to deliver the asset (Babatunde, Perera, Udeaja, & Zhou (2014). Ismail and Haris (2014) investigated constraints of PPP implementation in Malaysia using 122 participants. Barriers to successful implementation were identified as lengthy delays in negotiations, a lack of government guidelines and procedures on PPP, lengthy delays because of political debate, and confusion over government objectives and evaluation criteria. In Saudi Arabia, Al-Hanawi, Almubark, Qattan, Cenkier and Kosycarz (2020) found that legal barriers due to the delay in the approval of permits and further law and regulation changes were impediments.

2.9.7. Other factors

Parker (2009) identified factors such as lack of capital, technological problems, distrust among partners and misalignment of psychological contracts as risk factors that threaten the successful implementation of PPPs. There are also coordination failures which are caused by fewer incentives in the PPP market (EU, 2003). Kang, Mulaphong, Hwang and Chang (2018) listed factors that impede the successful adoption and implementation of the PPPs in developing countries, identifying five categories: political, economic, legislative, capital and management requisites. Like success factors, risk factors differ according to sector and region. For example, Babatunde, Perera, Udeaja and Zhou (2014) found that in Nigeria, the threat of expropriation and reluctance to tender, as well as public/political opposition, were the most highly ranked challenges experienced at the development phase. Moreover, the scholars found that risk factors, such as a bottleneck in securing execution of the federal government support agreement, were the most problematic factors at the implementation or construction phase. A lack of transparency and accountability were ranked first as an environmental barrier that

hinders the successful implementation of PPPs in the healthcare sector in Saudi Arabia (Al-Hanawi, Almubark, Qattan, Cenkier & Kosycarz, 2020).

Financial threats to the success of PPP projects at the various stages of the PPP project life cycle need to be investigated to ensure that projects are delivered successfully. The literature reviewed showed that although there are similarities globally and between developed and developing countries, CSFs also differ based on geographical regions and sectors. Common financing aspects that are considered critical for the success of infrastructure projects include available financial markets, good governance practices, the equitable allocation of risks, a project's financial and economic viability, and government guarantees. This suggests that the financing practices for the successful implementation of PPPs requires an independent assessment that is area-, stage- and sector-specific.

Chapter 3 : Research Methodology and Data

3.1 Introduction

This section outlines the methods and techniques that were used to address the research question. Specifically, research design, study population, data collection and analysis techniques are discussed, as are the research ethical procedures followed.

3.2 Research design

This study adopted a qualitative exploratory research design to answer the research question (Creswell, 2014). A research design is a set of plans developed to provide criteria and specifications for how a study is to be conducted (Onwuegbuzie & Leech, 2005). It is regarded as the blueprint for the data collection, measurement and analysis of data (Kothari, 2013).

An exploratory case study design was used to explore the critical success factors in financing PPP projects in the roads and transport sector in Gauteng province. This method is suitable for building cases where little is known, or practical experiences need to be compared with scripted practices (Creswell & Plano Clark, 2011). Using this design, it was possible to contextualise the success factors for effectively financing PPPs in the roads and transport sector in Gauteng.

Studies on the critical success factors of public private partnerships have been conducted across the globe using various research designs. A mixed method design is when a qualitive approach is used in the form of interviews with industry experts and focus groups, followed by a quantitative survey questionnaire, with the results being analysed using various statistical tools (Muhammad & Johar, 2018; Babatunde, Perera, Udeaja & Zhou, 2014). The most common method utilised is a quantitative survey questionnaire, which normally utilises a Likert scale, and various statistical tools are used to analyse and rank the findings (Babatunde; Opawole & Akinsiku, 2012; Cheung, Chan, Lam, Chan & Ke, 2012; Almarri & Abu-Hijleh, 2017; Osei-Kyei, Chan & Ameyaw, 2016; Maseko, 2014).

The researcher opted to follow a qualitative exploratory approach over a mixed method as discussed above as there are only a few PPPs in the roads and transport sector in Gauteng, all of which were selected as case studies. The choice of research design was also found to be the

most appropriate as candidates interviewed were mainly on an Executive level and best suited and informed to partake in the study and provide the necessary information required through an interview process. A survey utilising the Likert method for example would not have provided the researcher with sufficient qualitative information which was obtained through interviews. Further the researcher would not have had the necessary time to quantitively analyse the results of survey and statistically analyse the information.

3.3 Population of the study

The population of a study is described as the total set of individuals or units from which data are obtained (De Vos *et al*., 2011; Kumar, 2019). This study's population was comprised of selected PPP experts from various government agencies and concession company representatives responsible for the management and oversight of roads and transport PPPs in Gauteng. Those with intimate knowledge of the financial management of operational PPP projects in the sector were of key interest. Moreover, four case studies of completed PPP projects at a provincial level were selected as a data source.

3.4 Unit of analysis

3.4.1 Sampling.

Sampling refers to the selection of a representative number of individuals to provide information or data for a study. A sample is a subset of the total population that is carefully chosen to represent the rest of the population. In this study, a thorough literature review was first conducted to identify case studies on operational PPP projects that could help identify the success factors in financing PPPs. Sim, Saunders, Waterfield and Kingstone (2018) identified various methods that have been used to select a sample for qualitative studies, which include rule of thumb. It was recommended from the study that four to five cases were suitable for case study research using this method.

According to the National Treasury Online Budget (2020/21), 28 PPPs are currently active and accounted for by the National Treasury. Out of the 28 PPP projects, six relate to roads and transport PPPs, and five are within Gauteng or cut through Gauteng. They all followed the Design, Build, Finance, Operate and Transfer (DFBOT) PPP model. Four case studies were selected for the purposes of this research; the inclusion criteria were that they had to be at the provincial level, in the roads and transport sector, in Gauteng, and information related to the

project had to be accessible. Only one project/case was not selected out of the five cases identified in Gauteng. The researcher chose roads and transport projects in Gauteng as it is the economic hub of South Africa.

The snowball sampling technique was used to identify the first few respondents who matched the criteria and characteristics of the target population (Creswell, 2014). Thereafter, the identified respondents were asked to identify other respondents with relevant expertise on the phenomenon under investigation. The total sample size depended on the availability of the identified respondents. Sim, Saunders, Waterfield and Kingstone (2018) identified various sampling techniques that can be utilised for qualitative studies in the selection of the number of interview participants. Rule of thumb is one technique identified, where it was found that a sample of between two and 10 participants are required to achieve redundancy or saturation. Data saturation occurred when the respondents were no longer providing new insights into the critical success factors of financing PPP projects. In this study, data saturation occurred with the sixth participant, out of a total of nine. In the same study by Sim, Saunders, Waterfield and Kingstone (2018), numerical guidelines found that data saturation was reached in a thematic analysis within 12 interviews. The study further highlighted the importance of diversity in the experience and characteristics of the participants that are to be interviewed, hence the researcher interviewed participants from the regulator (National Treasury), government agencies (project owners), and the private sector concessionaires.

The researcher initially contacted four participants for the purposes of the research – one from National Treasury, one from academia, and two from the public sector. The two public sector participants recommended four other public sector participants in total, but only two took part in the study as the other two indicated that they did not have sufficient knowledge on the topic. The initial two public sector participants also recommended six private sector participants. Two were lenders who did not respond to the request for an interview, and one was not available. Hence, nine participants were interviewed. The total sample size depended on the availability of the identified respondents . In addition, due to time constraints and the availability of interviewees, nine participants were found to be appropriate.

3.5 Data collection

To collect data, interviews with experts were conducted, with the interview questions being shared beforehand. An interview guide (see Annexure A) with semi-structured questions was

used to gather information about financial practices and challenges in the implementation of PPPs in the roads and transport sector. The use of semi-structured interviews was advantageous in that it did not strictly follow a formal list of questions, but rather allowed the interviewees to express themselves and explain their circumstances regarding how they understood the phenomenon under study (Longhurst, 2003). Moreover, the researcher was able to obtain clarity on emerging issues raised by the interviewees. The semi-structured interviews thus gave the respondents an opportunity to offer a detailed picture about the success factors and hindrances to the successful financing of PPP projects. Field notes were collected during the interviews for purposes of data analysis, and videos or voice recordings of the interviews were made and stored.

The interviews were conducted with the nine participants online via Microsoft Teams or Zoom. Due to the Covid pandemic and the geographic location of some of the participants, face-to-face interviews were not possible. The interviewer did not ask leading questions in order to eliminate bias. The questions were semi-structured and open-ended in nature to allow each participant to provide their own views based on their experience.

The use of multiple sources of data is important for cross validation, which ensures the credibility and reliability of the findings (Ameyaw, 2015; Cheung, 2009).

3.6 Data analysis

The primary qualitative data were analysed utilising a thematic analytical approach, which was based on Braun and Clarke's (2006) step-by-step guide on performing a thematic analysis. The researcher followed the guide to generate a report that identified the success factors surrounding the financing of roads and transport projects. Based on the results identified from the analytical approach, a recommendation was made on how practitioners can successfully finance PPPs in the roads and transport sector.

Table 3.1: Phases of a thematic analysis

No	Phase	Description
1	Get familiar with the data	Transcribing data (if necessary), reading and re-reading the data, noting down initial ideas.
2	Generating initial codes	Coding interesting features of the data in a systematic fashion across the entire data set, collating data relevant to each code.
3	Searching for themes	Collating codes into potential themes, gathering all data relevant to each potential theme.
4	Reviewing themes	Checking if the themes work in relation to the coded extracts (Level 1) and the entire data set (Level 2), generating a thematic 'map' of the analysis.
5	Defining and naming themes	Ongoing analysis to refine the specifics of each theme, and the overall story the analysis tells, generating clear definitions and names for each theme.
6	Producing the report	The final opportunity for analysis. Select vivid, compelling extract examples, final analysis of selected extracts, relating back of the analysis to the research question and literature, producing a scholarly report of the analysis.

Source: Braun and Clarke (2006)

3.7 Trustworthiness

Golafshani (2003) indicated that qualitative research is a type of study where a researcher arrives at findings without using a statistical approach or quantification. This is mainly achieved through producing research based on real world settings. The process can thus result in biases emanating from the researcher's own perspective that can affect the reliability and validity of the study.

Reliability and validity are terms most often used in quantitative research; in the case of qualitative research, both these terms are conceptualised as trustworthiness, objectivity and quality. To eliminate bias, the researcher used triangulation, which involved the cross validation of multiple sources of information to identify themes in the study, resulting in the trustworthiness of the findings that are reported.

3.8 Ethical considerations

In research, ethical considerations is one of the most important aspects that deserve attention. It is required that before conducting a study, respondents must expressly or tacitly consent to partake in the study, and should understand the aims, purpose, implications and possible risks

of their involvement in the study. This study followed the below procedures to ensure that the study was performed ethically.

Firstly, the researcher obtained approval from the University of Cape Town Ethics in Research Committee. An ethical clearance certificate was obtained on 23 June 2021. A consent form and the interview questions were sent to all the participants prior to the interviews. The researcher enquired with each participant about the permission processes for each of their organisations to enable them to partake in their study. One government agency required a non-disclosure agreement to be signed between itself and the researcher, while another government agency required a letter of introduction, proof of registration with the university, and a copy of identification to be sent to the learning and development departments before approval was provided. The concessionaires did not have any specific organisational requirements.

Before interviewing the respondents, the purpose of the study was explained to them, and consent was obtained from them to partake in the study both verbally and in written format. The right of respondents to withdraw at any stage of the research was made known to them before starting any interview . The data collected are being held in confidence and will be used for academic purposes only. Moreover, they will be safely kept in electronic devices and remain accessible only to the researcher and her supervisors. Upon completion of the study, the findings will be reported and relayed back to the participants. Any publication of the data shall be in the form of academic journals.

Chapter 4: Discussion of Findings

4.1. Introduction

Chapter 4 discusses the findings identified based on the data that were collected. Section 4.2 highlights the unit of analysis, which is the four case studies that were selected and information about the interviewees who participated in the research. Section 4.3 discusses the findings identified from the interviews with the participants, while Section 4.4 reflects on how the validity and reliability of the findings were tested.

4.2. Profile of unit of analysis

4.2.1. Profile of PPP projects

4.2.1.1. N3 Toll Road

SANRAL entered into a 30-year concession agreement in 1999 with the N3 Toll Concession Pty (Ltd) (N3TC), which is a private entity specifically incorporated to manage and operate the concession (http://www.n3tc.co.za/). The concession is for the design, construction, finance, operation and maintenance of the N3 toll route, which begins at the Cedara interchange in KwaZulu-Natal and ends at the Heidelberg South Interchange in Gauteng. The N3TC has the right to collect toll tariffs from road users in order to service the debt raised to finance the capital works, and to operate and maintain the road (SANRAL, 2020). Some of the shareholders of the N3TC are Old Mutual Life Assurance Company Limited, Public Investment Corporation Limited, and AFC Equity Investments Limited. SANRAL does not make any financial contributions to the concessionaire in the form of capital grants, nor does it contribute to the operational expenditure of the concessionaire.

4.2.1.2. N4 East Toll Road

The government of South Africa through SANRAL, and the Mozambiquan government through its agency Administracao Macional de Estradas, entered into a 30-year concession agreement with TRAC N4, a private entity formed to design, construct, finance, operate and maintain a portion of the N4 toll road starting from eMalahleni (Mpumalanga) to Maputo (Mozambique), which subsequently expanded to Solomon Mahlangu drive interchange in Gauteng (https://tracn4.co.za/). The TRAC N4 utilises revenues collected from toll fees to service its debt, fund further capital works, and operate and maintain the road. Both

governments do not make a financial contribution to the TRAC N4, nor do they provide any government guarantees.

4.2.1.3. N4 West Toll Road

The Bakwena signed a concession agreement with SANRAL for the design, construction, operation and management of the N1 from Tshwane moving towards Bela, and the N4 running from Tshwane westwards towards Rustenburg. The initial equity partners comprised of international and local construction companies including Dragados and Murray & Roberts. They subsequently divested after the initial construction works were completed and the traffic patterns were known to existing institutional investors that were also shareholders. A special purpose vehicle was formed to operate and maintain the roads, Pt Operational Services (Pty) Ltd, which is comprised of a Spanish operator and a South African toll operator. The private sector raised all the capital necessary for the financing of the initial capital works and necessary upgrades, and subsequent maintenance and upgrades have been mainly funded from toll fees. (https://www.bakwena.co.za/)

4.2.1.4. Gautrain rapid rail link

The Gauteng Provincial Government (GPG) announced the Gautrain rapid rail project in 2000. Treasury Regulation 16 PPP process was followed and in 2006, the Bombela Concession Company (BCC) was awarded the bid. In the same year, the GPG established the Gautrain Management Agency to be the implementing agent of the Gautrain project, manage the relationship between the concessionaire and GPG, and manage the assets of the Gautrain, to mention a few (https://gma.gautrain.co.za/). The BCC holds a 20-year concession agreement to design, build, operate, maintain and part finance the Gautrain project. The shareholders of the BCC are Murray & Roberts Ltd, J&J Group Ltd and SPG concessions Ltd (https://www.bombela.com/shareholding/). The operations and maintenance of the Gautrain is performed through the Bombela Operating Company (Pty) Ltd (BOC) which is an arm of the BCC. The BOC shareholders include RATP Dev, which is an international company that maintains and operates inner city and urban rail networks across the world, and Strategic Partners Group, which is a South African broad-based empowerment company that invests in various business ventures (https://bombelaop.com/). The Gauteng provincial department provides a patronage guarantee to the concessionaire in the event that the revenues made by the concessionaire during the operational phase are below the minimum required total revenue

capped to the concessionaire demand forecast. The GPG further funded 87% of the capital costs of the project in the form of a grant.

Table 4.1: PPP project data

Project Name	Year	Concession period	Project owner	Concession company	PPP model	Project value	Funding source
N3 Toll Road	1999	30	South African National Roads Agency (SANRAL)	N3TC	DFBOT	R3 billion	Debt: 80% Equity: 20%
N4 East Toll Road	1998	30	SANRAL	TRAC N4	DFBOT	R3.2 billion	Debt: 80% Equity: 20%
N4 West Toll Road	2001	30	SANRAL	Bakwena Toll	DFBOT	R3.2 billion	Debt: 80% Equity: 20%
Gautrain Rapid Rail Link	2006	20	Gauteng Management Agency on behalf of Gauteng Provincial Government	Bombela Concession Company	DFBOT	R31.8 billion	Debt 11% Equity: 2% Govt: 87%

Source: https://vulekamali.gov.za/infrastructure-projects

4.2.2. Profile of participants

Overall, nine participants took part in the study who were employed in the private or public sector within roads and transport infrastructure, public private partnerships. Eight of the participants provided consent by signing the GSB-approved consent form as well as verbally before the start of their interview. One of the participants only provided consent verbally prior to their interview. Four case studies were selected as detailed in Section 4.2.1, which were the N3 Toll Road, N4 East Toll Road, N4 West Toll Road and the Gautrain rapid rail link. All the interviews were conducted either via Zoom or Microsoft Teams, and were recorded. Due to Covid and the limited availability of the participants, the researcher found it appropriate to interview the participants online. Most (78%) of the participants were male and 22% were female. The average age of the participants was 51 years old. They had a combined experience in the areas of infrastructure development, financing and PPPs of 198 years; 67% were executives within the organisations listed in Table 1.

Table 4.2: Biographical details of the interview participants

Variable	Attributes	Frequency	Percentage
Gender	Female	2	22%
	Male	7	78%
Age	30 – 40	2	22%
	41 – 50	2	22%
	51 – 60	3	34%
	61 +	2	22%
Role in organisation	Executive	6	67%
	Senior Management	3	33%
Qualifications	Certificate/Diploma	0	0
	Degree	0	0
	Postgraduate	9	100%
Years of experience	10 – 20	3	33%
	21 – 30	3	33%
	31 – 40	3	34%

Source: Research data 2021

4.3. Critical success factors for financing PPP projects

This study sought to explore the critical success factors for successfully financing PPP projects within the roads and transport sector in Gauteng. Critical success factors are those activities or conditions that need to be present or performed to reach a certain desired outcome. The results of the thematic analysis conducted identified eight factors as critical for financing PPPs:

- Financial markets
- Experienced and skilled private sector consortium
- Value for money
- Government support
- Procurement processes
- Learning from others and experience
- PPP finance structure
- Risk allocation

The discussion of the findings is detailed in the upcoming sections.

4.3.1. Financial markets

Well-developed capital markets enable the private sector or the government to access long term funding through debt instruments or attract equity investors within the financial markets of the country in local currency. PPPs are capital intensive – the average project value of the toll roads in this study was R3.1 billion (see Table 1). The availability of financial markets makes it possible to implement projects of this scale. The majority of the participants indicated that there is sufficient capital available in the financial markets of RSA for the private sector to invest in infrastructure projects and the financial markets are well developed. However, they did note that there is a lack of well packaged, financially feasible and bankable projects within the country. Participant 1 stated the following:

"Yes, there is sufficient capital available in the financial markets provided that the project is appropriately designed looking at the engineering element, the more clarity on the outcomes/output specifications there more responsive the financial markets are. Financial model and scoping of tolling must be clear as the private sector costs based on risk and if the project is too risky, they won't invest."

One participant, when requested to identify challenges in financing PPPs, indicated that a significant portion of debt financing is sourced from banks and thus they ordinarily dictate the terms of financing. The participant further highlighted that pension funds are reluctant to fund greenfield projects as there is no proven track record of the project, thus making the risk too high.

Policy certainty was also highlighted as a factor that motivates the markets to invest in projects within the country, as the tenure of the PPP agreements normally run for 30 years.

Participant 4 stated that in the roads sector, there is an opportunity to retender and incorporate more roads for tolling. In addition, there is an opportunity to concession public rail networks, thus the government is able to dictate the movement of goods between roads and rail.

The above findings are consistent with the literature, where it was identified in a study that South Africa's financial markets are positively focused for infrastructure development, which is credited to its strong regulatory and legal frameworks (Young, 2013).

4.3.2. Experienced and skilled private consortiums

One of the key benefits of a government utilising PPPs to deliver infrastructure is that they are able to leverage private sector expertise, efficiency, skills and experience. Partnering with an experienced and skilled private sector consortium thus contributes towards the success of the project. This study identified that in order to mitigate challenges in the financing of PPPs, a team of experts needs to be utilised by both the private and public sector to identify the deliverability of finance, financial feasibility, and the financial impact on the public sector through the risk assessment processes in the inception, feasibility and procurement stages of a PPP (see Figure 2.1).

Participant 8 stated that the project provides value for money for the public sector "*as the system is run like a business* (by the private sector*) and it is clean, safe, well maintained, and professional".*

The negotiations around, and management of, funding for infrastructure are critical components. Two participants indicated that qualified professionals are required to debate the complexity of financing to provide a competitive edge, and the negotiation team must be comprised of professionals from different disciplines such as engineering, finance and legal, as they can provide different perspectives. The former was further identified to be important to ensure that the debt is fairly priced and the shareholders returns are reasonable.

The study further identified that following the PPP route allows government to timeously deliver infrastructure, as the private sector raises the required capital and utilises its skills and expertise to deliver on infrastructure projects.

Participant 2 stated that: "*Following a PPP route assists government in the timeous delivery of infrastructure projects, eases the fiscus and stimulates the economy."*

The above is consistent with the literature, as Chan et al. (2010) identified that a strong consortium with the necessary management competence and expertise is necessary for financing and implementing infrastructure developments.

4.3.3. Value for money

As part of assessing if a project will deliver value for money for the government, various factors need to be considered, including affordability for the state; affordability for users; social, economic and developmental impact; and the quality of the service to be provided. Most of the participants indicated that PPPs provide value for money to the state based on reasons such as private sector raising the capital required for the project; value for money must be proven as a constitutional requirement during the feasibility stage of the project before the PPP is approved by the National Treasury; and private sector expertise is utilised to manage and operate the project.

Four participants indicated that PPP projects provide value for money as private capital is utilised and the public sector only has to make repayments over a long period of time, hence providing relief for the fiscus. The projects are generally able to provide long-term cash flows even after the conclusion of the initial concession agreement with the private partner.

Participant 9 stated: "*The cost of the upgrades and further the impact on economic development along the route provides value for money. It further stimulates economic growth.*"

The study also identified that value for money was assessed on the benefit that it will have to the users of the road, where Participant 1 stated that the PPP provides a "*benefit to the public through the reduction of vehicle operating costs* [and] *good working infrastructure*".

Participant 5, when asked what the challenges are in financing PPPs, indicated that: "*The value of the tender during the award phase is often different to the final value upon contracting especially around the equity contribution to be made by private sector. Mainly due to cost of risk being allocated to the private sector. Thus, the government viability gap funding increases. Hence project may cost more than envisioned to the public sector.*"

The above is consistent with the literature as it was found that an infrastructure project must demonstrate economic viability (Geroniks & Legnieks, 2015:30; Schoenmaker, 2018:1). In other words, the infrastructure being developed must be able to generate long-term cash flows, be profitable over time, and must be characterised by minimal competition.

4.3.4 Government support

Government support refers to the extent of the political, financial and legislative backing that the government provides for an infrastructure project to be implementable. The study found that good practice for successfully financing PPP projects is for government to set aside a budget for the funding of feasibility studies. If the government institution does not have sufficient funds to fund a feasibility study, they are able to approach development finance institutions (DFIs) like the DBSA in order to access project preparation funding. It was identified that SANRAL has strong financial governance disciplines and was often able to raise funding for project preparation.

Participant 6 stated that: "*worldwide, priorities are ranked due to long term capital requirements from a financial and engineering perspective. Provision of a budget for the feasibility study by the public sector is important. In some instances, the public sector will obtain project feasibility funding from DFI's such as (IIPSA) which is a grant that must be repaid and forms part of the project costs.*"

The study found that there are instances where the government is not able to set aside funding for a feasibility study as the costs of the study can amount to between 2% and 6% of the total cost of the project. At times the public institution may also not be able to raise the money from the financial markets, hence impacting the ability for the project to kick off. If DFIs are approached, the project outputs have to be aligned with the objectives of the fund that the DFI is managing.

The study found that a well-packaged project is critical in enhancing the ability of the public/private institution to attract equity partners or raise debt from a bank. The project has to be financially feasible and government must back the project to provide comfort to potential investors.

Participant 9 stated that the finance challenges incurred in the Maputo Development Corridor (N4 East Toll Road) were that: "*In the inception of the project in 1996 South Africa had just*

entered a new democratic government, Mozambique had come out of a civil war. Both countries were looking to improve each other's economy. The project started as a protocol agreement between the two countries. There was high political risk, new financial policies were being promogulated which increased the assessed risk of the project. Policy certainty was required. On the onset of the project, it was not financially feasible but it was able to attract investors through risk sharing model and contractual arrangements."

In the instance of the Gautrain project, it was found that a dedicated budget was set aside by the public sector to make unitary payments to the private partner, with restrictions placed on the funds to ensure that they are not used for any other purpose. This provides comfort to the private partner and investors that the government will be able to meet its financial commitments.

The study identified that government has enabling legislation to support the development of PPP infrastructure projects. Participants indicated that the National Treasury Regulation 16 was not in place when the three toll road projects were conceptualised, and the SANRAL Act was used to enable the public sector to follow a PPP process, thus the concessions were approved by National Treasury. The Gautrain followed the Regulation 16 process as it was enacted during the conceptualisation of the project. It was further identified that the South African PPP framework was being adopted by other SADC countries, but is currently under review to benchmark it with worldwide developments.

Challenges were identified by some participants relating to the current legislation and legal frameworks, such as the Gauteng Transport Infrastructure Act not allowing for commercial activity within the Gautrain stations. In addition, the current Infrastructure Development Plan does not make mention of PPPs as a procurement model, and the National Treasury framework for infrastructure delivery should also incorporate the PPP model.

In order to mitigate financial challenges and further attract funding, this study found that government must have clear and specific project outputs/outcomes when going out on tender.

When asked if there is sufficient capital available in the financial markets, Participant 1 stated that: "*Yes provided that the project is appropriately designed looking at the engineering element the more clarity on the outcomes/output specifications there more responsive the financial markets are. Financial model and scoping of tolling must be clear as the private*

sector costs based on risk and if the project is too risky they wont invest. Transparency on what is required from the private sector is NB to allow for innovation."

When participants within the Toll Road projects were asked if the government provided any guarantees, they indicated that it did not. The government only has to make payments to the private partner if the annual toll fee increases were not gazetted by the Minister. If government builds an alternative road, this can result in a *force majeure* and the private party would have a claim against the government. If the government cancels the concession agreement based on contractual reasons, it would have to pay back the equity and debt owed by the private partner at the time.

Participants further highlighted that the Gautrain was the first private passenger rail in the country and ridership numbers were not certain, thus the government agreed to provide a patronage guarantee.

The participants also highlighted that the government should rather utilise in-house skills in the areas of contract negotiation and the evaluation of projects, which would require it to build capacity.

Participant 3 stated: *"Crucial skills need to be inhouse especially cause SANRAL has multiple projects of this nature and should be retained over the life cycle of the concession /PPP as the contract must still be managed over the last span.*"

The above findings are consistent with the literature as good governance, political support and the provision of government guarantees were found to be CSFs in the implementation of infrastructure projects in both the developed and emerging markets (Cheung, Chan, Lam, Chan & Ke, 2012; Babatunde, Opawole & Akinsiku, 2017; Almarri & Abu-Hijleh, 2017; Muhammad & Johar, 2018).

4.3.5. Procurement process

The South African government's procurement-related legislation is highly regulated and promotes fairness and competitiveness, which is supported by the Constitution. Procurement relates to needs assessments, sourcing, evaluations, contract awarding and contract management. Figure 2.1 details the stages of a PPP stemming from the National Treasury guidelines.

All the interviewees indicated that the procurement processes in the awarding of a PPP are competitive and fair.

Participant 2: "*Bidding processes are competitive if there is sufficient interest in the expression of interest stage of the bid. Normally three bidders is enough.*"

Participant 9: "*Yes the process is competitive as the technical proposal is evaluated and not only the price is looked at including the legal requirements, environmental, funding model, toll pricing and strategy hence not only about competitiveness of toll tariffs.*"

The study found that the procurement processes followed are in line with Section 217 of the Constitution of South Africa, which requires that a government institution should put in place a system that is fair, equitable, transparent, competitive and cost effective when contracting for goods and services. The study further found that PPP procurement processes are transparent and the nature of the projects are highly technical in nature, hence corruption is minimal.

Participant 7 stated that the: "*procurement process was well designed and implemented, stages in the procurement process were clearly articulated, multi stage bidding process was followed and it took five years but based on the size it could have taken longer.*"

Eight participants however indicated that the PPP processes are inefficient as the process of going to market, evaluating the bid and negotiating the contract with the winning bidder takes to long. It was further identified that within the operational stage of the PPP, the procurement processes are inefficient as there are multiple stakeholders that need to approve the awarding of contractors for goods and services based on the technicality of the work that needs to be done and the structure of the special purpose vehicle.

Participant 5 stated that the, "*Procurement process* [is] *not efficient. Procurement processes take to long especially around going to market which occurs in two stages example Request For Proposal must first be issued, then evaluation done internally by public sector, then Request for Quotation (RFQ) is sent out (Closed tender) then RFQ must be evaluated. Evaluation processes are long as there must be a bid specification/technical committee to sit and approve specifications/outputs; bid evaluation to evaluate RFP and RFQ.*"

Two participants highlighted that legislation states that 30% of the work being contracted should be awarded to the local community, which at times is a challenge during the operational

phase. This is due to the fact that some of the work is highly technical in nature and members within the local community do not have the necessary experience and expertise to perform the work, thus if the contractor is appointed outside the local community, they will need to insource labour. Unrest in local communities can also occur if their demands and expectations for the project are not met. The concessionaire must provide three months for the awarded contractor to set up community structures before they start with the work. It was, however, highlighted that the benefit of the legislation is that skills and expertise are retained locally. It was further highlighted that community unrest impacts investors' appetite to invest in similar projects.

Participants highlighted that it is important that the scope of the work and the service level agreement be clear between the private and public sectors during the contracting stage, including the level of service, further capital works required which have a monetary impact, and the engineering requirements which must be met.

Participant 9 stated that: "*All parties need to have a clear understanding of the scope and the solution being provided and how it must be evaluated including the level of service requirements, pavement, riding speed. The process also helps the government to understand the risks of the project from the onset and further how they should be priced and further evaluated.*"

Similar findings were found in studies on mainland China and Nigeria, where it was identified that a transparent and efficient procurement process is critical for the implementation of PPP (Cheung, Chan, Lam, Chan & Ke, 2012; Babatunde, Opawole & Akinsiku, 2017).

4.3.6. Learning from others and experience

This section mainly highlights how government and the private sector leverage knowledge sharing through case studies, working groups and collaborations with other government or private sector institutions that have completed similar projects.

When participants were asked how they identify and mitigate challenges with financing PPPs, they indicated that a lot of emphasis is placed on obtaining an understanding of international best practice. They also build relationships from the public sector side with other foreign government institutions, such as the UK Treasury in the case of the Gautrain rapid rail link project, as they have a lot of experience in projects of this nature. It was also found that case studies on concluded transactions are also utilised locally to share knowledge on best practices

and areas of improvement to assist other government institutions that are developing new projects.

Participant 4 stated that: "*A lot of emphasis was placed on understanding international best practice and further bringing in international experts to mitigate risk of knowledge gap. Failures and successes of other countries were assessed e.g. South America over estimated the traffic flows hence unsuccessful*."

The interviewees also indicated that during the negotiations on funding, international best practice should be taken into account. They noted that PPP contractual agreements are complex in nature and there is a risk of differences in interpretation, adding that there needs to be more flexibility with regards to how risk is allocated upon contracting and the practical implementation thereof during the operational phase. It was identified that other governments and private institutions that are considering PPPs can learn from contractual issues identified in PPPs that are currently in the operational phase.

4.3.7. PPP finance structure

This section details the type of funding model that was utilised to raise capital to finance the PPP projects under consideration. It further discusses the types of challenges and best practices that were employed in the financing of the PPP projects.

The study found that funding was obtained from various sources, including private local and international investors, pension funds, government grants or guarantees, and equity investors. The operations and debt service costs of both the SANRAL toll roads and the Gautrain are mainly funded by the users in the form of toll fees and ticket sales respectively. However, in the case of the Gautrain, the government also pays a patronage guarantee to the concessionaire if ridership drops below a certain agreed upon level as per the calculated minimum required total revenue.

Investors make their returns from the successful operation of an infrastructure asset. It was identified that the source of financing is dependent on the outcome of a financial feasibility study, specifically the financial model, the objectives of the state institution, and how the PPP is structured. It was identified that bankers would normally require a gearing ratio of 80%/20% locally based on the assessed risk; in international projects within developed countries a gearing ratio of 90%/10% is often acceptable. Hybrid funding, where the government and the

private sector contribute towards the initial capital infrastructure costs, is used when it is not financially viable for the private sector to fund the full capital costs on its own as the assessed risk of the project is too high.

Participant 6 stated, "*Bankers recommend a gearing ratio of 80%/20% locally and 90%/10% internationally. SPV normally uses an overdraft facility until the construction is completed (draw downs). It is thus converted into long term loan after construction. Interest rate risk normally hedged/ fixed. SPV can raise bonds but not happening in RSA. World wide, Export credit agencies can provide funding for importing of equipment up to 30% of the total project cost.*"

It was found that the public sector must be actively involved in the funding negotiations if they will be financing a portion of the project, and the bidders must clearly define their financing strategies in their submitted bid. In all four cases under discussion, special purpose vehicles were established by the concessionaires for the purposes of the initial capital works/development phase, as well as the operation and maintenance of the infrastructure assets.

When participants were asked what the best financing practices are, one participant indicated that in the case of SANRAL's toll plazas, the public sector did not have to make a capital contribution for the early works. It also does not fund the operations, as all capital and operational funding requirements are addressed by the concessionaire. The participants also indicated that in the case of the SANRAL toll roads, no government guarantees have been provided and the concessionaire carries all the market and traffic risks.

Two participants indicated that one of the best financing practices in the case of SANRAL's toll roads is that the concession agreement allows for a profit share between the private sector and public sector when the profits being made by the concessionaire reach a certain level. This occurs after a certain period of time when the capital repayments have been met by the concessionaire, which may occur around year 18 to 20.

Participant 1 stated: "*Profit sharing is possible over a certain period of time with the concessionaire. The first half of the concession agreement the concessionaire has to service its debt as per its cash flow cascade . In year 18/20 the concession starts to generate a significant amount of profit and the concession agreement has a clause in the contract where a formulae is applied to share profits.*"

The study also found that in the instance of SANRAL's toll roads, there is a cap on the profits and returns that can be made by investors. This ensures that the road users are not disadvantaged by high toll fees and that the concessionaire does not make super profits.

When asked if the concession provides value for money, Participant 3 stated that, "*the concessionaire is profit driven hence not all decisions are for benefit of users for example no special rates offered during weekends to road users. Concessionaire often wants to stay within the confides of the contract including instances were early expansion of roads must be done*".

This study found that challenges around the financing of PPP projects were identified during the preparation of the financial feasibility study. A financing challenge that was identified in the implementation of a PPP by Participant 1 was around deliverability of finance. Participant 1 stated the following:

"*An assessment is done on how feasible the finance plan is by financial advisors and further an independent assessment is performed. Letter of commitment is required from a financial institution. The cost effectiveness of the proposed financial solution is assessed including the hedging strategy proposed. The cost of the goods and services that will be delivered per financial model. Assumed terms and the level of contingency required and further if sufficient due diligence is performed. Financial plan must be robust and sensitivity assessed in an instance of downside risk. The quality of the shareholders - The financial strength and experience of the shareholders is assessed.*"

Another financing challenge that was identified by a participant is that it is important for the government to include a clause within the concession agreement that in the instance of a project being refinanced, they will share in the upside. This is important as the financing risk is often high at the onset of the project as there is a lot of uncertainty. However, as the PPP starts to demonstrate over a number of years that it is operating successfully, operational costs are known and profits are starting to be made, then the concessionaire is able to renegotiate the conditions of the debt financing received.

Due to the size (Rand value) and complexity of the projects discussed, it was identified that the reporting requirements to lenders and equity partners are quite rigorous especially those of lenders, as their financing model is risk-based and they continual need to manage their risk. However, it was further highlighted that the concessionaire or government (in instances where

they have taken out financing) put controls in place to satisfy the lender's reporting requirements and debt service coverage ratio, for example.

4.3.8. Risk allocation

A key aspect of a PPP is that risk is transferred to the party that is best able to manage it. This section details how some of the risks stemming from the projects were shared among the private and public sectors, and further how risk is being managed.

The participants were asked about the process that is followed in the allocation and management of risk between the public and private sector. The study found that risks are allocated to the party that is best able to manage the risk, and the risk allocation process must be fair and equitable. Risks are initially identified during the feasibility study process, which is performed by the government. It was identified in the study that the probability of the risk occurring is assessed, the risk is quantified, a mitigation plan is developed, and the risk is then allocated to the party best able to mitigate it. It was found that the allocation also occurs when the private partner and government are negotiating the terms of the contract. Risks are continually identified and mitigated throughout the duration of the projects as the concession arrangements are roughly 30 years. Risk management is thus an ongoing process. If the risks are not appropriately identified and mitigated, they may result in a legal dispute between the parties to the implementation of the project.

Participant 7 stated that: "*Risk assessment is done as per the National treasury guidelines. National treasury has a standardised contract it has developed for PPP which allocates risks and forms the basis of the concession agreement. Standardised contracts are cost effective for other government institutions as there is no need to reinvent the wheel.*"

In the case of the SANRAL toll roads, the following risks were transferred to the concessionaire: traffic, revenue, financing, design, construction (traffic flow should be reasonably known otherwise the public sector will take on construction risk) and operational risks. The study found that the public sector carries risks relating to environmental management, public participation and law enforcement (illegal overloading, public unrest, etc.).

Participant 8 stated: "… *Some of the risk that were allocated had materialised and some of the mitigation plans were found to be ineffective. Some of the risk that was allocated did not make*

commercial sense especially on the side of the concessionaire. The concessionaire has their own internal risk management framework and mechanisms to mitigate risks… The management of risk is a partnership."

It was further found in the study that if the capital funding requirements of the private sector are too high, it may reduce the risk appetite of investors, for example in the case of the Gautrain. The government contributed 87% of the capital requirements, which made the project more financially viable for investors. The project was the first private rail network and there was insufficient data around ridership, market, etc.

A financing challenge that was identified was that government needs to assume more risk in the concession agreements, as the more risk that is allocated to the private partner the more expensive the project becomes.

It was identified in the study that concession agreements need to be more flexible as they are long term in nature. Amendments to contracts are often done, in the case of the Gautrain, through a variation process where a memorandum of understanding was entered into between the two parties that formed part of an annexure to the contract, i.e., no amendments were made to the original signed contract. This occurs in the instance, for example, where a clause in the contract is impossible to achieve. It was thus found that it is important to have effective systems in place to monitor the contractual agreements as they are complex in nature, and there should further be an effective change management process.

The study found that the banking sector provides a significant portion of the debt financing, thus they often dictate the terms of financing and are only interested in financing financially viable projects. Toll tariffs increase according to the inflation rate on a year-by-year basis, which forms a natural hedge for inflation-linked loans and mitigates price risk. It was also found that because the private sector carries all the traffic risk in the case of toll road projects, the debt service costs are high. In addition, government policy and the stability thereof is priced in as a risk in the cost of funding, as are security and exchange rate risks. In the instance of the N3 toll route, there were existing traffic and toll roads on the route, hence it derisked the expected revenue risk.

The study found that the risk profile of the projects change over time. This is often due to the construction risk being minimal after the development stage of the project; there being demonstratable revenue streams after operating for a certain period of time; and the project

being able to show a return on investment. The private partner is thus able to approach lenders to renegotiate the terms of their loans, as they provide funding according to a risk-based model. In addition, when there is a demonstrable reduction in the risk profile of a project, more favourable terms may be negotiated, for example lower interest rates.

Participant 9 stated: "… *in 6/7 years the project builds up financial history hence risk has reduced e.g. traffic flows can be accurately predicted and operational expenditure is clearly known and hence the project becomes a going concern. A refinancing exercise can be done if the risk is lower to obtain new terms like a reduced interest rate hence the debt service costs become cheaper, which can result in an upside for the shareholders....*"

4.4 Summary of critical success factors

The below chart depicts the critical success factors of financing PPP projects in the roads and transport sector in Gauteng, as identified in the study.

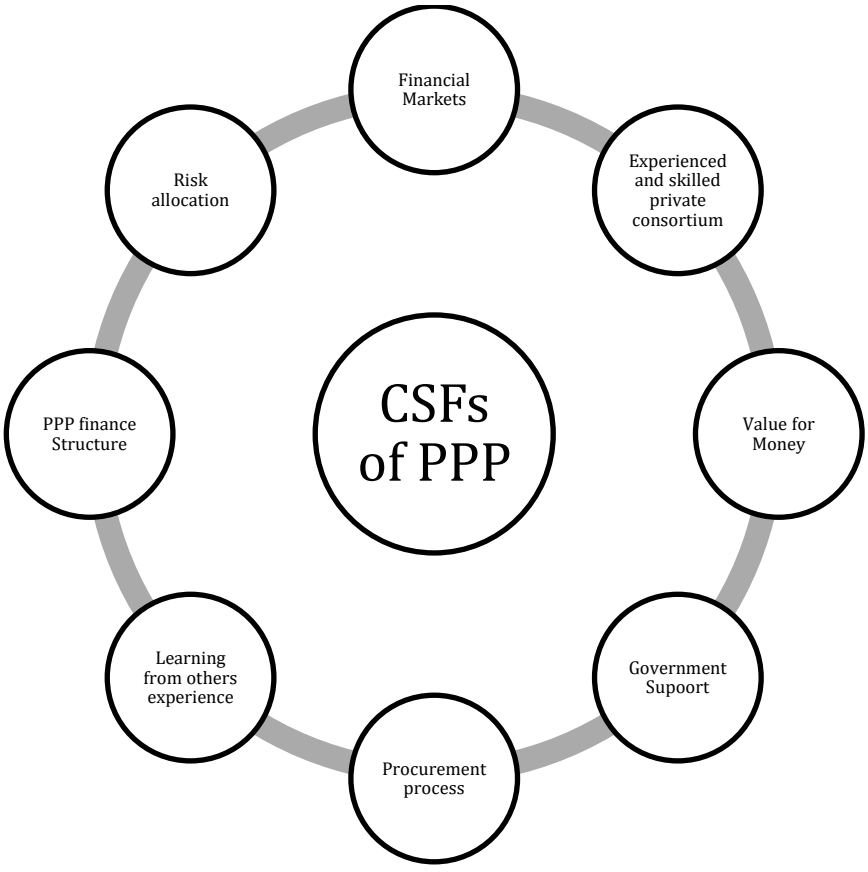

Figure 4.1: Critical success factors of financing PPPs

The critical success factors of financing PPPs in the roads and transport sector in Gauteng have been identified as being similar to those identified by the researcher in her empirical framework. Learning from others' experience, the PPP finance structure and government support in its varying forms were also found to be contributors to the success of the PPPs examined in the study.

Chapter 5 : Conclusion

5.1. Introduction

The purpose of this study was to identify the critical success factors in financing roads and transport sector PPPs within Gauteng province. An extensive literature review was performed on the critical success factors for PPPs, looking at global and local studies. Interviews were conducted with experts from the private and public sectors who have experience in PPPs in South Africa. This chapter highlights the findings and the limitations of the study, and concludes with suggestions for further studies.

5.2. Summary and conclusions

In order for the country to achieve the targets set out in the National Development Plan, there is a great need for investment in infrastructure to support the social and economic goals of the country. These include electricity, water, roads, schools and housing infrastructure to create a facilitating environment for businesses to operate within the country, to improve the quality of lives of citizens, and to stimulate job creation to address the high unemployment rate. The National Infrastructure Plan of 2050, which was sent out for public comment by the Department of Public Works in September 2021, highlights the use of public private partnerships as a key mechanism to finance public infrastructure. This stems from the constrained fiscus and the vast backlog in infrastructure development.

The study found that government support, which includes the development of enabling legislation to support the implementation of PPP projects, creating in-house capacity for project development within government institutions, and further investment in project preparation, are critical for the successful development and implementation of PPP projects. The government is moving in the right direction with the proposed National Infrastructure Plan as well as the review of the PPP legislation to align it with international best practice.

Government, as legislated in the National Treasury regulations relating to PPPs, requires PPPs to provide value for money for the state. This could be in the form of social and/or economic benefits, i.e., it is not sufficient for PPPs to solely address the financing gap.

One of the key reasons, which was also identified as a critical success factor, for government to choose to enter into PPP agreements with the private sector, is for the purpose of risk allocation and mitigation. In a PPP structure, risk is transferred to the party best suited to manage that risk. The private sector also brings its expertise, skills and experience in the development and operationalisation of PPPs.

Procurement processes must be transparent, fair, competitive and efficient. In addition, the manner in which the funding of a PPP is structured is critical. The study found that special purpose vehicles are created for the development and operation of PPPs by the private sector; in the instances of toll roads, the public sector mainly did not make a financial contribution to the upgrades/development of the roads infrastructure, nor did it bear operational costs. The government further required equity partners to come on board from the private sector concessionaire so that the private partner will show commitment to the success of the project.

Finally, learning from others through case studies, research and sharing of knowledge amongst government agencies both locally and internationally contributes to the ability of government institutions to identify challenges and further best practices.

5.3. Limitations

In Gauteng there are a limited number of PPPs relating to roads and transport. It was further found through the interview process that a point of saturation was reached and responses were similar in nature. The researcher did not have sufficient time to expand the study to other provinces within the country, or to interview a wider pool of participants, such as financiers.

5.4. Recommendations

5.4.1. The best team for the job

For the successful development and implementation of PPP projects, it is critical that the public sector identifies and partners with the private partner that has the necessary skills and experience. Government further needs to develop internal capacity to support the PPP development and implementation phase, as well as protect its interests. The skills required for the development and implementation of PPPs are highly specialised in nature, thus government should provide competitive remuneration packages to retain these skills in-house. Internal knowledge management and sharing of best practices across government institutions, both locally and internationally, are also vital to not repeat others' mistakes.

5.4.2. Investment in training and development

National Treasury, as the oversight body for PPP projects, should invest in training private sector and government agencies so that they are able to understand the PPP processes and the benefits, and can develop and implement PPPs. Training is specifically required in the legislative requirements, including the PPP procurement processes. Government employees who are within the institutions that are responsible for infrastructure role-out and are directly involved should have training on PPPs and further project preparation as a standard item in their skills development plans. Building internal capacity will further allow government to retain more risk and reduce the cost of funding, as the more risk that is transferred to the private party, the more expensive debt and equity funding will be. This would impact the net cash flow of the project in the short to medium term, and hinder the government's ability to start realising a share of the profits in the medium to long term.

5.4.3. Government involvement in the negotiation of funding

The negotiation of funding should include all parties, even if the private sector is providing 100% of the funding. In the instance where the private sector is providing 100% of the funding, the public partner should provide oversight of the process as the terms of condition of the funding being obtained by the private partner may impact the cash flows of the project and thus project continuity. Further, clauses within the contractual agreements may have a negative impact on the going concern of government agencies when guarantees are required. It is also critical if co-funding is being provided that the contractual clauses relating to termination and default be fair to both parties, and that the remedies stipulated impact both parties depending on the nature of the breach. Revenue sharing clauses between the government and private sector should also be included in contractual agreements once the project starts to generate profits and the equity partners have made a return on their investment.

5.4.4. Procurement process

The procurement processes of PPP should be fair and competitive. This includes during the operational phase, where a portion of the goods and services are required to be awarded to local communities. The private sector should also invest financial resources into the training and development of local communities to enable them to be competitive.

5.4.5. Community protest

All spheres of government, including local government and law enforcement, should actively work together to reduce community unrest and vandalism to infrastructure. Community protests delay project implementation and reduce private party involvement in PPP projects. There is a growing number of business forum mafias who take over projects unlawfully and make unrealistic demands on project implementors, which hinders progress on infrastructure projects. These can be addressed through advocacy, where the community is engaged on the economic and social impact of the project and the detrimental impacts of disruption on the livelihoods of local communities and further continuation of the projects. Law and order should also be instilled without fear or favour. Agreements between the local communities and the implementing agencies should also be beneficial to all parties involved.

5.5. Future areas for research

Future studies could assess the economic impact if the infrastructure needs of the country are not met in 2030, as envisioned in the National Development Plan.

Another area of future study could be to assess the criticality of developing an effective and efficient transport infrastructure network within the SADC region to promote inter-African trade and enable the achievement of the goals and ambitions set out in the African Continental Free Trade Agreement.

5.6. Conclusion

Transport and rail infrastructure are critical for trade as they are vital for the enhancement of inter-African trade initiatives and agreements. The study's findings on the critical success factors of financing transport infrastructure are consistent with international best practice, i.e. an available financial market which enables the private and public sectors to raise capital funding in their local currency; a sound legislative environment; government support; value for money to the public sector throughout the project's life cycle; and clear economic and social benefits. Risk allocation and management should also consistently be managed and understood, and appropriate risk mitigation strategies must be implemented throughout the project. In addition, procurement processes should remain fair and competitive, and learning from others' experiences and knowledge sharing is critical. Sound management should be a critical aspect throughout the project development and implementation phase, and lastly, a skilled and

experienced private party should consistently be utilised in the development and implementation of PPPs.

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ANNEXURE A

UNIVERSITY OF CAPE TOWN

Master of Commerce in Development Finance

INTERVIEW/SURVEY CONSENT FORM

Participant name: ……

I volunteer to participate in a research project conducted by **Lufuno Mudau** as partial fulfilment of the requirements for the **Master of Commerce in Development Finance Degree** at the UCT Graduate School of Business. I understand that the research is designed to gather information about **Exploring the Critical Success Factors For The Successful Financing Of Private-Public Partnerships In The Roads And Transport Sector: A Case Study Of Gauteng Province** and that I will be one of approximately eight (8) people being interviewed for this research.

Objective(s) of the research

- To explore the critical success factors for the financing of PPPs in the roads and transport sector in Gauteng province

Ethics approval

The ethical clearance for this study was approved by the UCT GSB Research and Ethics Committee on **23 June 2021**.

Participation and confidentiality

I understand that my participation in this research is voluntary, that I will not be compensated and that I may withdraw at any time. The interview will take approximately 45 - 60 minutes to complete and will be audio recorded.

I understand that I will not be identified by name in any reports using information obtained from this interview and that my confidentiality as a participant in this study will remain secure. Subsequent uses of records and data will be subject to standard data use policies which protect the anonymity of individuals and institutions.

Should you have any questions or concerns please contact me on email at lmudau001@gmail.com or on my cell phone on 083 946 6554 or my supervisor at Latif.alhassan@gsb.uct.ac.za.

Consent

I consent to participate in this interview, based on the terms outlined above and subject to the following additional condition of my own (if any).

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Signed by interviewee **Date**

…….. …….

Signed by Student **Date**

Questions

Section 1: Demographic information

1. Gender of respondent:
2. Age of respondent:
3. Nature of business:
4. Years of experience:
5. Current role in business:

Section 2: Interview/Survey questions

1. To explore the critical success factors for the financing of PPPs in the roads and transport sector in Gauteng province

1.1. What are/were the best financing practices in the implementation of PPP(s) projects? Follow up:

1.1.1. What sources of funding were used?

1.2. What are/were the financing challenges in the implementation of PPP(s) project? Follow up:

1.2.1. How are/were these financing challenges identified?

1.2.2. How are/were these financing challenges mitigated?

1.3. What is the process that is followed in the allocation and management of risk between the private and public sector and is it effective in your view?

1.4. Are there any shortfalls or guarantees that need to be covered by Government over and above the amounts received from the users? (case specific)

1.5. Is there sufficient capital available in the financial markets to fund PPP projects

1.6. In your view does the PPP project provide value for money to the government?

1.7. Does the policy and legal framework in RSA support the procurement of a project in the form of a PPP and are the legislative processes efficient? Follow up:

1.7.1. What needs to be changed to in terms of legal framework and government support to improve Financing in the PPP projects?

1.8. Are the procurement processes efficient and competitive?

2. Other questions

2.1. How were or should the funding negotiations be managed or organised?

2.2. In what instance will the agreement/contract be renegotiated?