

Project finance as a driver of economic growth in Africa

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Declaration

I, Johann J Lübbe, declare that the entire body of work contained in this research assignment is my own, original work; that I am the sole author thereof (save to the extent explicitly otherwise stated), that reproduction and publication thereof by Stellenbosch University will not infringe any third party rights and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

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Abstract

Like many developing countries in the world, African countries face real economic growth, poverty and inequality challenges. To exacerbate these challenges, African countries also face severe infrastructure backlogs. These infrastructure backlogs are not limited to the creation of new assets, but includes the upgrading, refurbishment and rehabilitation of existing infrastructure. Many researchers have investigated the infrastructure-growth nexus and found that infrastructure contributes towards an increase in productivity and national output. It is, therefore, important to understand the role that project finance is, and can be playing in infrastructure development in African countries, with the ultimate aim of increasing economic growth and development.

The question whether or not project finance contributes towards economic growth was based on an empirical analysis, making use of secondary data. The control variables chosen for the study comprised the most common variables used in the literature. A standard panel regression model was used to determine whether project finance had an impact on economic growth in the African countries over the period 2000 to 2013. Both a one-way and two-way fixed-effect model was analysed using three panels.

The research focussed on the finance-growth nexus with a specific focus on project finance. It was shown that the flow of foreign capital into a country is often a function of the level of development of the financial system in that country. Project finance as a specific financing mechanism is particularly successful in attracting local and foreign capital to projects in perceived riskier markets, i.e. growing economies with weak or underdeveloped financial, legal, institutional and governance systems. Project finance is, therefore, an effective tool to finance projects in high-risk environments.

Financial development contributes to both the quality and quantity of capital available in the financial markets. It is, however, the 'quality of capital' that contributes towards, and influences economic growth and development in an economy.

The results of this study are consistent with the literature and imply that project finance fosters economic growth.

Although project finance is a complex financing mechanism, it is particularly successful in economies with weak financial and legal systems, and the use of project finance should be encouraged by governments in Africa for the provision of public infrastructure. Project finance as an alternative financing mechanism can play an important role in eradicating infrastructure backlogs on the African continent and thereby contribute towards economic growth on the continent. Policy changes should create an enabling environment conducive to and promoting project finance as a preferred financing mechanism in African countries.

Key words

Project finance

Economic growth

Financial development

Infrastructure

African countries

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List of acronyms and abbreviations

bn	billion
BRICS	Brazil, Russia, India, China, South Africa
FDI	foreign direct investment
GC	government consumption
GDP	gross domestic product
GMM	generalised method of moments
IMF	International Monetary Fund
MSE	mean squared error
OECD	organisation for economic cooperation and development
PF	project finance
PICC	Presidential Infrastructure Coordinating Commission
PG	population growth
PPP	public-private partnership
SOC	state owned company
SPV	special purpose vehicle
SSA	sub-Saharan Africa
SSE	sum of squared errors
US	Unites States of America
US\$	United States of America dollars
WDI	world development indicators

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Many factors influence and/or cause economic growth and development. For many years, researchers, economists, policy makers and governments have investigated and researched the causal link and relationship between financial development and economic growth. However, researchers have conflicting views on the finance-growth relationship and the impact or importance of financial development on economic growth. Some researchers argue that financial development does not cause or is not important for economic growth, but rather follows or is a consequence of economic growth (Lucas, 1988; Robinson, 1952). On the other hand, some researchers have found that financial development and the strength or depth of a country's financial systems (sophistication of financial systems) do contribute towards economic growth (Miller, 1998; Schumpeter, 1911; King & Levine, 1993; Thiel, 2001; Ndikumana, 2000). For the latter school of thought the question is not 'if', but rather 'how' financial development can affect economic growth. Financial development contributes to both the quality and quantity of capital available in the financial markets. It is, however, the 'quality of capital' that contributes towards and influences the economic growth and development in an economy (Kleimeier & Versteeg, 2010).

Financial development consists of many financial instruments that can potentially contribute to economic development. One such specific instrument is 'project finance', which is of particular importance due to its ability in facilitating and promoting infrastructure development, specifically in underdeveloped financial markets. Infrastructure in itself is also a contributor to economic growth (Sanchez-Robles, 1998; Egert, Kozluk & Sutherland, 2009). The World Bank recognised the importance of infrastructure and found that a one per cent increase in the overall infrastructure stock translates into a one per cent increase in gross domestic product (GDP) (World Development Report, 1994). By its very design, project finance is intended to promote investment management, good governance and management of project risks.

Project finance has seen a dramatic increase in recent years, increasing from around US\$12.5 billion (bn) in 1991 (Kleimeier & Versteeg, 2010) to around US\$280 bn in 2013, with a deal count of 548 (Infrastructure Journal, 2013). After reaching record levels of investment in 2007 (around US\$320 bn), the total global project finance volume fell to around US\$180 bn in 2009 following the global financial crisis of 2008/9. Volumes increased in 2010 and 2011 to around US\$242 bn and US\$248 bn respectively and decreased somewhat during 2012 to US\$186 bn (Infrastructure Journal, 2013). According to the Infrastructure Journal (2013), Europe (US\$209 bn) was the leading region in terms of the volume of project finance transactions followed by the Americas

(US\$207 bn) and Asia & Pacific region (US\$189 bn) over the period 2011 to 2013. Africa and the Middle East benefitted the least from project finance transactions with a volume of US\$111 bn.

According to data obtained from the Thomson Reuters Loan Pricing Corporation's Dealscan Database, Africa attracted project finance transactions to the value of US\$80.8 bn over the period 2000 to 2014. South Africa, Egypt and Nigeria were the African countries that benefitted the most from project finance transactions between 2000 and 2014, with transaction values of US\$22.5 bn, US\$15.5 bn and US\$11 bn respectively. The three African countries that benefitted the least over this period were Libya, Malawi and Ethiopia, with transaction values of US\$0.09 bn, US\$0.1 bn and US\$0.2 bn respectively. However, only 24 African countries benefitted from project finance over the period 2000 to 2014, with the remainder of the countries not attracting any project finance transactions. When compared to the BRICS countries (the association of five major emerging world economies of Brazil, Russia, India, China and South Africa), African countries perform poorly. Brazil, Russia and South Africa were the BRICS countries who benefitted the least from project finance transactions between 2000 and 2014, with transaction values of US\$30.7 bn, US\$65.8 bn and US\$22.5 bn respectively. The leading BRICS countries in respect of project finance transactions over this period were India with US\$215.1 bn, and China with US\$241.1 bn.

According to Chan, Forwood, Roper and Sayers (2009), governments around the world are increasingly investing in infrastructure as a means of counteracting the global financial crisis, in an attempt to stimulate their respective economies through, amongst others, job creation and improving economic performance. This infrastructure investment initiative, however, is hampered by the availability of funding, also as a result of the crisis. To support this occurrence, Kumo (2012) found that there was a strong multilateral causal link between economic infrastructure and GDP growth in South Africa. This means that "economic infrastructure investment drives the long term economic growth in South Africa while improved growth feeds back into more public infrastructure investment". Kumo (2012) further found a "strong two way causal relationship between economic infrastructure investment and public sector employment reflecting the role of such investments on job creation through construction, maintenance and the actual operational activities". Increased employment could in turn contribute to further infrastructure investments indirectly through multiplier effects across the economy. In order for South Africa to reach its socio-economic and other growth targets, Kumo (2012) believes that the South African government should increase and sustain the level of infrastructure investment in years to come.

Project finance by its very nature is intended to be used in both developed as well as unsophisticated financial markets and is designed to account for risk and to reduce transaction costs. Project finance further accounts for the inability of developing economies to mobilise and pool savings. Project finance can, therefore, also be used in lower-income and developing countries. Kleimeier and Versteeg (2010) found that project finance was a strong driver of

economic growth in low-income countries with a move from the 25th to the 75th percentile in project finance resulting in an annual growth of 0.67 percentage points.

1.2 PROBLEM STATEMENT

Like many developing countries in the world, African countries face real economic growth, poverty and inequality challenges. To exacerbate these challenges, African countries also face severe infrastructure backlogs. These infrastructure backlogs are not limited to the creation of new assets, but includes the upgrading, refurbishment and rehabilitation of existing infrastructure. Many researchers have investigated the infrastructure-growth nexus and found that infrastructure contributed towards an increase in productivity and national output (Sanchez-Robles, 1998; Egert *et al.*, 2009; Aschauer, 1989; Canning, 1999; Esfahani & Ramirez, 2002; Calderon & Serven, 2008). Calderon and Serven (2008) also found that the lack of adequate infrastructure was a major constraint for economic growth in sub-Saharan Africa (SSA). The South African Presidential Infrastructure Coordinating Commission's (PICC) research showed that for every three per cent rise in infrastructure spending, South Africa's GDP increased by one percentage point (Engineering News, 2015c).

According to Rabinowitz (2008), South Africa is faced with two key infrastructure challenges, namely (i) the significant infrastructure backlog and the spend that will be required to eradicate this backlog; and (ii) the limited borrowing capacity of government and State-Owned Companies (SOC). Financing of infrastructure will, therefore, have to be done using alternative funding mechanisms such as off-balance sheet or project finance models. The provision and financing of public infrastructure will also have to involve the private sector. During the recent Gauteng Infrastructure Investment Conference (held on 16 and 17 July 2015 in Johannesburg, South Africa), various speakers confirmed the need for the South African Government to partner with the private sector to ensure that the required infrastructure was provided. The Gauteng Premier, Mr David Makhura, reiterated that the Gauteng Government would have to partner with the private sector to respond to the R1 300 billion (over 15 years) social and economic infrastructure requirements in the province (Engineering News, 2015a). The Minister in the Presidency of South Africa, Mr Jeff Radebe, warned that 'on budget' resources are limited and that 'off budget' solutions would have to be pursued in order to address the infrastructure challenges faced by South Africa. Mr Radebe noted the 'user pay' principle as one of the mechanisms to finance critical infrastructure projects (Engineering News, 2015d). This view was supported by the Industrial Development Corporation's Khumo Morolo, who warned that conventional investment mechanisms to fund public infrastructure development was no longer sufficient and that innovative financing mechanisms and models are needed to fund public infrastructure. Morolo suggested the establishment of special purpose vehicles with the ability to enable revenue-generating infrastructure projects (Engineering News, 2015b).

It is, therefore, important to understand the role that project finance is, and can be playing in infrastructure development in African countries with the ultimate aim of increasing economic growth and development.

Very little research exists on project finance in Africa and South Africa, and project finance (in its purest form) in South Africa is rare (Rabinowitz, 2008). The recent Independent Power Producer programme in South Africa has, however, resulted in increased project finance transactions.

Nevertheless, the real impact that project finance has had on economic growth in Africa remains unclear. Although Kleimeier and Versteeg (2010) included some African countries in their study, a study on the effect of project finance on economic growth in African countries alone has not been done. African countries probably find themselves in the unique situation of facing specific challenges (of governance, large infrastructure backlogs, corruption, conflict and perceived lawlessness, being landlocked, large unemployment, low levels of human capital development, etc.), while at the same time experiencing extraordinary growth prospects and opportunities. This study is aimed at answering the following research question:

- To determine whether project finance has contributed towards economic growth and development in African countries over the past 14 years.

1.3 RESEARCH OBJECTIVES

Esty (2004) argued that due to the growing demand for investment in infrastructure and the increased importance of project finance as infrastructure financing mechanism, both public and private sector role players (corporate executives, engineers, lawyers, bankers, government officials and politicians) need to understand what project finance is, its benefits and value, and how to structure projects that are bankable.

The purpose of this research is to:

- i) Illustrate the fact that project finance contributes towards economic growth;
- ii) Create awareness and highlight the importance of project finance for economic growth and development in a country;
- iii) Motivate and promote the use of project finance as an appropriate financing mechanism in Africa and specifically South Africa; and
- iv) Motivate policy changes that will create an enabling environment conducive to and promoting project finance transactions in South Africa.

1.4 IMPORTANCE/BENEFITS OF THE STUDY

This research investigated and determined whether project finance was a contributor to economic growth in Africa over the past 14 years. The research is important for the following reasons:

- To increase the awareness that project finance contributes towards economic growth;

- To promote project finance as an alternative funding mechanism for infrastructure development in Africa; and
- To facilitate the development of infrastructure in Africa upon the acceptance of project finance as a preferred financing mechanism for infrastructure in Africa.

1.5 CHAPTER OUTLINE

The first chapter of the research assignment sets the context and background to the study and includes the research problem, research question and objectives of the research. The second chapter provides a theoretical framework for the research in the form of a comprehensive theoretical and empirical literature review. Chapter 3 presents the research methodology and data used, while Chapter 4 reflects the results of the empirical analysis. Chapter 5 contains the summary, conclusion and recommendations of the research assignment.

1.6 SUMMARY

Researchers have investigated the link and relationship between financial development and economic growth for many years. Financial development contributes to both the quality and quantity of capital available in the financial markets and Kleimeier & Versteeg (2010) argued that it was the 'quality of capital' that contributed towards and influenced the economic growth and development in an economy. Project finance is a financial instrument that can potentially contribute towards economic development, especially in undeveloped financial markets. Project finance is intended to be used in both developed and undeveloped financial markets and is designed to account for risk and to reduce transaction costs. Project finance is an alternative financing mechanism that can be used to raise project capital in low-income and developing countries where capital and investment is scarce. The next chapter will explore the theoretical and empirical literature to investigate the finance-growth relationship as well as to determine whether project finance contributes to economic growth.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

A literature review is performed to determine and investigate the theory behind the link between financial development and growth. Specific focus is on project finance as a financial instrument to promote economic growth. The literature review firstly focused on the theory behind the finance-growth nexus, whereafter the growth enhancing properties of project finance was investigated.

2.2 THE FINANCE-GROWTH NEXUS IN THEORY

The traditional literature argues that economic growth is determined mainly by the quantity of capital as the key determinant of financial development, i.e. financial development will lead to an increase in capital, which in turn leads to economic growth. However, Schumpeter (1911) argued that finance stimulated growth not through the creation of more capital (by increasing savings), but rather through the improved allocation of savings, i.e. improving the quality of capital. Hasan, Koetter and Wedow (2009) confirmed this view in a recent study, which compared the importance of the quality of finance and the quantity of finance in Europe. Hasan *et al.* (2009) found that “an increase in the efficiency (i.e. quality) of bank finance creates up to five times more growth than a corresponding increase in the quantity of bank finance”.

Merton and Bodie (1995) defined the primary function of financial systems as the facilitation and allocation of resources across space and time in an uncertain environment. Levine (1997) and Levine (2004) analysed this primary function and broke it down into five ways in which financial markets could contribute towards the quality of capital. Firstly, financial markets facilitate the trading, hedging, diversification of portfolios and pooling of risk, through various instruments and mechanisms such as insurance products and pension funds. Secondly, sophisticated financial markets (i) improve access to capital and (ii) improve capital allocation. This will result in the lowering of financial restraints as well as lowering the cost of capital. Thirdly, financial markets promote and enforce good corporate governance and control, which deals with information asymmetries and agency costs. Fourthly, financial markets mobilise savings and facilitate the pooling of funds. Lastly, financial markets facilitate the production and exchange of goods and services.

This view that financial markets increase economic growth is supported by empirical evidence and research. King and Levine (1993) found that an improvement in a financial system would result in an increase in economic growth. Levine and Zervos (1996, 1998) found that well developed stock markets had a direct positive impact on economic growth.

Emerging economies and developing countries are, however, faced with the challenge of increasing their economic growth while it is still developing, reforming and improving its financial systems. One way of achieving this is by importing finance in the form of international capital flows. International capital can increase the quantity of capital, lower the cost of capital, and, if structured correctly, increase the scope of risk diversification (Kleimeier & Versteeg, 2010). However, it is important to maintain and focus on the quality of capital rather than on the quantity of capital in emerging markets. It is also imperative that proper consideration is given to the riskiness and cost of foreign capital so that it is not to the detriment of emerging economies.

The question, therefore, remains which types of finance is available to emerging economies where financial markets are still underdeveloped and international capital flows are risky. Kleimeier and Versteeg (2010) identified two types of capital, namely portfolio equity investments and foreign direct investment (FDI). International equity investments are, however dependent on well-developed stock markets, which are often not available in emerging economies. According to Hausmann and Fernandez (2000), FDI was not dependent on sophisticated domestic financial markets and could be used to substitute domestic financial markets. However, some research has shown that FDI is only beneficial if a certain threshold of development has been reached. A lack of human capital, underdevelopment of financial markets or institutions and trade restrictions can hamper the positive impact of FDI on economic growth (Borensztein, De Gregoriob & Leec, 1998; Alfaro, Chanda, Kalemli-Ozcan & Sayek, 2004; Durham 2004; Balasubramanyam, Salisu & Sapsford, 1996). Similarly, Blomström, Lipsey and Zejan (1992) and De Mello (1999) found that only high-income countries and Organisation for Economic Co-operation and Development (OECD) countries would benefit from FDI. Reisen and Soto (2001) found that developing countries should not rely solely on domestic savings, but should also encourage and facilitate FDI and portfolio equity inflows to stimulate long-term growth prospects.

2.3 PROJECT FINANCE AS A CONTRIBUTOR TO ECONOMIC GROWTH

Gatti (2013) defined project finance as “the structured financing of a specific entity – the SPV, or special purpose vehicle, also known as the project company – created by sponsors using equity or mezzanine debt and for which the lender considers cash flows as being the primary source of loan reimbursement, whereas assets represent only collateral”. According to Yescombe (2014), project finance is “a method of raising long-term debt financing for major projects through ‘financial engineering’, based on lending against the cash flow generated by the project alone; it depends on a detailed evaluation of a project’s construction, operating and revenue risks, and their allocation between investors, lenders and other parties through contractual and other arrangements.” By design, project finance is aimed at large-scale, complex projects (often infrastructure related) with significant risk and information asymmetries. Project finance transactions are characterised by high leverage, i.e. relatively low levels of equity (provided by project sponsors) compared to high levels of debt. Debt is either in the form of limited or no-recourse loans. Project finance

transactions are further aimed at allocating risk (construction, operating, demand, price, etc.) to the parties best equipped to manage and mitigate the risk (Gatti, 2013). Chan *et al.* (2009) argued that the choice of a financing mechanism was often influenced by the project risk and the most appropriate mechanism was the one that would ultimately best manage the project risk (assigning a specific risk to a party best placed to manage/mitigate the risk).

Project finance transactions are designed around the establishment of a ring-fenced special purpose vehicle (SPV) and a number of contractual arrangements. Project finance as a financing mechanism is, therefore, able to be implemented in undeveloped financial markets where it will, through the characteristics listed above, emulate and 'artificially create' well-developed financial markets. Project finance is, however, dependent on a strong legal and regulatory environment where contracts are honoured and the rule of law is enforceable. Kamanga (2008) found that governance (and in particular the rule of law) played a major role in attracting private sector investors in project finance deals. Project finance is often implemented as an alternative to corporate finance, but has the following advantages over corporate finance. Firstly, it increases the availability of finance and, secondly, it reduces the overall risk associated with the project (Ahmed & Fang, 1999). Project finance is, therefore, an attractive alternative financing mechanism, especially in developing countries and emerging economies (where it has seen significant expansion during the 1990's according to Ahmed & Fang, 1999) where financial development remains low.

Project finance is strongly associated with the provision of long-term finance, which in turn will support future economic growth. The Group of Thirty (2013) promulgated four principles that should govern the provision of long-term debt. First, the Group of Thirty (2013) argued that in order to meet the investment needs of the real economy, financial systems should be designed to pool individual and corporate savings into an adequate supply of financing with longer-term maturities. This may typically be in the form of pension funds and insurance products. Second, that long-term finance should be provided by entities with longer-term financing horizons. Third, that long-term investment should be supported by a range of financial instruments. Fourth, that an efficient global financial system (including regulation) should promote economic growth through stable cross border flows of long-term finance.

It is important to measure the effectiveness and advantage of project finance against the five ways in which financial markets can contribute towards the quality of capital as defined by Levine (1997), in order to substitute domestic financial markets and to manage transaction costs:

- Risk management: Like most financial products and instruments, project finance is also characterised by the risk/return principle where a high risk investment will require a high return. However, Kleimeier and Versteeg (2010) argued that when capital was scarce (particularly in domestic markets) and investors were risk averse, they would prefer low risk/low return investments. This phenomenon will have a negative impact on economic

growth as higher risk projects, which often have a higher growth impact, will be overlooked. Project finance may not change the investment behaviour of domestic investors, but will continue to attract international investors and ensure capital flow towards growth enhancing projects (Kleimeier & Versteeg, 2010).

- **Capital allocation:** Project finance improves the efficiency of capital by allocating capital to growth enhancing infrastructure sectors. Project finance further provides for all aspects of capital requirements such as operation, maintenance and replacement, and, therefore, further enhances the allocation of capital. However, care should be taken to prevent improved capital allocation that will reduce risk to such an extent that it will lower saving rates (Levine 2004).
- **Corporate governance:** The design and structure of project finance lends itself to promote good corporate governance and to substitute for lacking domestic structures. The advanced legal and risk management structures, which is integral to project finance, is based on international best practise and intended to facilitate and promote investment in projects. Hainz and Kleimeier (2006) found that project finance is the preferred financing mechanism in countries with high political (sovereign) risk and poor governance structures.
- **Mobilise savings and facilitate transactions:** Project finance by definition is aimed at facilitating large investments and transactions by crowding in a number of investors. This is done through syndication where syndicates often comprise large international banks and financing institutions. Project finance is, however, often aimed at pooling international funding and does not always contribute towards mobilising domestic savings and transactions (Kleimeier & Versteeg, 2010).

Chege (2001) identified the following conditions as essential for the success of project finance transactions:

- A supportive policy environment, which creates a conducive macro-economic environment;
- A stable economic environment;
- An economic and country environment where business is transparent, contracts are respected and disputes are resolved efficiently and fairly; and
- A stable legal and regulatory environment conducive to private sector investment and activity.

2.4 INFRASTRUCTURE DEVELOPMENT IN AFRICA

Governments are traditionally responsible for the provision (owning, operating and maintaining) of public infrastructure (such as water services, roads and transportation, electricity, and social amenities such as schools, hospitals, etc.). According to Chege (2001), infrastructure expenditure

in developing countries is mostly funded by host governments directly from the fiscal budgets. It is estimated that countries in SSA finance around 65 per cent (approximately four per cent of SSA's GDP) of its infrastructure expenditure from public sector budgets (International Monetary Fund, 2014). Governments, however, do not always possess the required skills and expertise to access the different sources of funding and are often reliant on the private sector for this expertise. Increased private sector involvement in the financing of infrastructure projects are, therefore, critical to provide for the increasing demand for infrastructure. While trading services (water and sanitation and electricity services) provide an opportunity for the private sector to become involved in the provision of infrastructure through the implementation of user charges, the non-trading services will mostly remain a public service. A government's involvement in the provision of infrastructure may also be required where the benefits of an infrastructure project will extend beyond the direct users and may exceed the potential revenue from user charges (Chan *et al.*, 2009).

The National Treasury of South Africa has developed a public private partnership (PPP) model and established a PPP unit in the National Treasury with the mandate to identify, prepare and close PPP transactions in the public infrastructure space in South Africa. PPPs seem to have fallen into disfavour in both the public sector as well as the private sector. It is important to explore the reasons why PPPs have not met expectations in South Africa. A general perception exists that PPPs are synonymous with privatisation. Privatisation has met with strong resistance in South Africa and the privatisation perception even extends to the concept of private finance. More importantly, PPPs are seen as being synonymous with project finance. This misconception has led to a legislative framework being established for PPPs instead of a more general framework that would enable and indeed facilitate project finance transactions – of which both PPPs and private concessions would form subsectors.

The African continent has seen strong economic growth in recent years, but despite a significant infrastructure backlog, only ten per cent of global private investment flowed to infrastructure in Africa between 1990 and 2011, compared to 40 per cent to Latin America over the same period (Wentworth, 2013). International infrastructure experts attribute this to the “shallowness of national utility markets in Africa” and highlight the strategic importance of presenting regional infrastructure projects to the private sector (Wentworth, 2013). Harris (2003) identified overstaffing and mismanagement in the public sector in Africa as two of the factors that contributed towards insufficient investment in infrastructure, inadequate planning, poor maintenance and unsustainable sector governance in Africa. Chege (2001) identified the barriers to private sector involvement in infrastructure projects as policy and regulatory concerns, weak domestic capital markets and the high transaction and bidding costs. South Africa, however, has advanced financial and utility markets, but still struggles to prepare bankable infrastructure projects.

Calitz and Fourie (2010) highlighted the importance and increasing acknowledgement by the public sector of the need to separate bankable from non-bankable infrastructure projects. To this effect a larger portion of traditionally tax-financed projects are now being regarded as self-financing projects that can be financed within or outside government budgets. Calitz and Fourie (2010) further made the very important observation that if more projects were financed on a self-financing project finance basis, it would leave additional fiscal space on government budgets to finance the non-bankable portion of the public infrastructure projects, i.e. where a 'user pays' principle could not be applied. Calitz and Fourie (2010) identified the following factors as the main reasons why South Africa's ability to mobilise private capital (loans and equity) ranked superior to that of other developing countries:

- South Africa's well developed financial markets (trading of bonds and shares and in which institutional funds represent an important source of funding);
- The South African government's status as a borrower of good standing with a relatively good credit rating;
- A programme of gradual and phased privatisation of public enterprises; and
- Steady development of public-private partnerships.

In considering the sources of loan financing, Calitz and Fourie (2010) importantly noted that South Africa (as an upper middle-income country) was increasingly seen as a source of development finance and donor funding rather than a destination. It is for this reason that private capital will remain the primary source of loan and equity finance in South Africa.

In a study on the importance of infrastructure for growth in SSA, Estache, Speciale and Veredas (2005) argued that inadequate infrastructure was a major constraint for sustainable and inclusive growth in SSA. Foster and Briceno-Garmendia (2009) estimated that the SSA region required around US\$ 93 billion per annum to provide for the demand in infrastructure. Estache *et al.*, (2005) estimated the annual infrastructure spending requirement to be between nine per cent and 13 per cent of GDP, against a norm of between five to six per cent (Gutman, Sy & Chattopadhyay, 2015). Policy decisions are amongst the main factors contributing to the current infrastructure gap in SSA. Calderon and Serven (2008) also found that the lack of adequate infrastructure was a major constraint for economic growth in SSA.

Calderon and Serven (2008) identified geographical features (specifically the large number of land-locked countries in SSA) and the remoteness of African economies to global markets as two of the most important reasons why Africa was struggling to compete on global markets. This results in higher transport costs, which directly impacts on the competitiveness of African economies in world markets. High transportation costs further hampers intra and inter-regional trade and economic development in SSA. Low population densities exacerbate the problem. This leads to the importance of infrastructure in SSA in unlocking the region's economic development potential.

Hulten (1996) argued the importance of the effective use of infrastructure and showed that the inefficient use of infrastructure reduced some of the benefits generated by investments in infrastructure. Hulten (1996) compared the growth experience in Africa with that of East Asia and found that more than 25 per cent of the differential growth rate between these two regions could be attributed to the difference in the effective use of infrastructure resources. When comparing low and high-growth economies, Hulten (1996) found that more than 40 per cent of the growth differential could be attributed to the efficiency effect, making it the single most important reason of differential growth performance. Hulten (1996) further noted that private investments in infrastructure (for example through project finance) had a far greater impact on economic growth than public investment in infrastructure.

2.5 SUMMARY

In considering the extent of financial development in a country and the impact it has on economic growth, it is important to consider both the quantity and quality of capital. Although the literature reveals different perspectives, many researchers argue that the quality of capital is more important than the quantity of capital. The quality of capital becomes even more important when considering the primary function of financial systems as the facilitation and allocation of resources across space and time in an uncertain environment.

The challenge remains for emerging and developing markets to grow their economies while domestic financial markets and systems are still underdeveloped. This leads to the challenge of finding the most appropriate type of finance that will attract investments into emerging economies where financial markets are still underdeveloped and international capital flows are risky.

Project finance is a flexible financing mechanism, which can be adapted to different market conditions and risk situations. Therefore, project finance is an ideal mechanism to be utilised in underdeveloped financial markets. Project finance is also ideally suited for infrastructure projects, which are often associated with high-growth investment characteristics.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

The question whether or not project finance contributes towards economic growth was based on an empirical analysis, making use of secondary data. For the purpose of this study, the research methodology and data analysis was based on the research by Kleimeier and Versteeg (2010). The control variables chosen for the study were according to Alfaro *et al.*, (2004), as well as Kleimeier and Versteeg (2010), and comprise the most common variables used in the literature. A cross-country analysis was performed on the African countries over the period 1 January 2000 to 31 December 2013.

3.2 DATA COLLECTION

The set of control variables was obtained through secondary data sources. GDP (in current US dollars) and GDP per capita (calculated as gross domestic product divided by mid-year population) were obtained from the World Bank's World Development Indicators (WDI). Data on project finance (PF) transactions was obtained from Thomson Reuters Loan Pricing Corporation's Dealscan Database. The project finance deals were obtained from the 'Totals & Averages Report' and grouped according to host country and year of financial close. Transaction values were based on the debt component of each deal and excluded any equity component.

With regard to the control variables, data on schooling was obtained from the Barro-Lee Educational Attainment Dataset (Barro & Lee, 2010) and reflects the average total years of schooling in the adult population. Population growth (PG), government consumption (GC), openness (trade volume), inflation and FDI were also obtained from the WDI. Population growth is reflected through the annual population growth rate for year t being the exponential rate of growth of mid-year population from year $t-1$ to t , expressed as a percentage. Government consumption reflects the final consumption expenditure of households and government as a percentage of GDP. Openness is defined as imports plus exports over GDP. Inflation is measured by the annual growth rate of the GDP implicit deflator and shows the rate of price change in the economy as a whole. FDI refers to direct investment equity flows in the reporting economy and is expressed in current US dollars. The law variable reflects the 'rule of law' and captures perceptions of the extent to which agents have confidence in and abide by the rules of society. The law variable was obtained from the World Bank's Worldwide Governance Indicators. Kleimeier and Versteeg (2009) also used the black market premium (difference between the parallel and official exchange rate) as a control variable, but due to this data set not being available for the sample countries over the analysis period, this variable was excluded from the analysis.

3.3 DATA ANALYSIS

The methodology followed to determine whether project finance has an impact on economic growth was analysed by way of a standard panel regression model using the following equation:

$$y_{it} = \sum_{k=1}^K \beta_k x_{itk} + u_{it} \quad (3.1)$$

where K is the number of independent variables/regressors, β is a k -dimensional coefficient vector to be estimated, x_{it} is a k -dimensional vector of independent variables/regressors, and the u_{it} term determines the error structure. Both a one-way (where $u_{it} = \gamma_i + \epsilon_{it}$) and two-way (where $u_{it} = \gamma_i + \alpha_t + \epsilon_{it}$) fixed-effect model were analysed using three panels over the periods 2000 to 2005 (five years), 2006 to 2010 (five years), and 2011 to 2013 (four years).

Missing data was as far as possible imputed by the average value of the corresponding panel, if at least half of the observations for that panel was not missing. By following this approach, a complete dataset could be formed after data aggregation to the three panels, except for the Openness and Schooling variables. For the Schooling variable, missing values were imputed by the average over the entire 14-year period, since the countries that had missing values had missing patterns for more than half the observations in each period/panel. Openness was calculated as (Imports + Exports)/GDP, but only for the years in which all three these variables were present. Thus, for the imputed values, Imports, Exports and GDP were stored only for the years in which none of these three variables were missing. Only those African countries that had a cumulative Project Finance value of greater than zero (23 countries) were included in this study. Table 4.1 contains a list of the countries that formed part of the study.

The aggregation approach and data transformation for the regression were done in the following manner. Countries with no PF volumes during the study period from 2000 – 2013 were excluded, resulting in $N = 23$ countries. Missing data for the years of PG, Inflation, and Law was imputed by the average for the available data for the respective periods/panels. This could be done, since none of these variables had more than half of their observations missing. For the Schooling and Government Consumption variables, missing values were imputed by the average over the entire 14-year period, since the countries that had missing values had missing patterns for more than half the observations in each period/panel. Initial GDP was calculated as the log of the GDP per capita for the first year in each period/panel, i.e. this value will be the same for all years in a particular period/panel. Openness was calculated as (Imports+Exports)/GDP, but only for the years in which all three these variables were present. Thus, for the imputed values, Imports, Exports and GDP were stored only for the years in which none of these three variables were missing.

The variables in the imputed table were then aggregated to create the variables to be inserted in the models. Growth is the dependent variable and the mean value over each period was selected.

The PF values were aggregated (summed) and multiplied by 100 (for expression as a percentage) and then multiplied by 1 000 000 (since the units are in millions of dollars), and divided by the aggregated value of GDP per period. The FDI values were aggregated and multiplied by 100 (for expression as a percentage), and divided by the aggregated value of GDP per period. Population growth was calculated as the mean of the imputed values per period. Schooling was calculated as $\log(1+\text{mean}(\text{Schooling}))$, where the average was taken from the imputed values per period. Inflation was calculated as $\log(3+\text{mean}(\text{Inflation}))$, where the average was taken from the imputed values per period. The '3+' term replaced the '1+' used by Kleimeier and Versteeg (2010), to avoid errors when taking logs. This was necessary, because many African countries experienced negative inflation over the study period. Law was calculated as $\log(\text{mean}(\text{Law}))$, where the average was taken from the imputed values per period. Government Consumption (GC) was calculated as $\log(\text{mean}(\text{GC}))$, where the average was taken from the imputed values per period. Initial GDP had the same values for all years in a particular period. The Imports, Exports and GDP variables used in calculating Openness were as described earlier, i.e. only used for the years in which all three variables are non-missing. Openness was therefore calculated for each period/panel, as the $\log(\text{mean}(\text{Imports}+\text{Exports}) * 100 / \text{mean}(\text{GDP}))$.

3.4 SUMMARY

The research assignment is based on an empirical analysis of various control variables comprising the most common variables used in the literature. The dependent and control variables were obtained through secondary data sources and a cross-country analysis was performed on the African countries over the period 1 January 2000 to 31 December 2013. A standard panel regression model was used to determine whether project finance had an impact on economic growth in the sample countries over the period 2000 to 2013. Both a one-way and two-way fixed-effect model was analysed using three panels over the periods 2000 to 2005 (five years), 2006 to 2010 (five years) and 2011 to 2013 (four years).

The next chapter reports on the findings of the empirical analysis.

CHAPTER 4

FINDINGS

4.1 INTRODUCTION

The research is based on an empirical analysis making use of secondary data. A standard panel regression model was used to determine whether project finance had an impact on economic growth in the sample countries over the period 2000 to 2013. Both a one-way and two-way fixed-effect model was analysed using three panels. The study focused on African countries with 23 countries forming part of the sample. The remainder of the countries did not have any significant project finance transactions over the study period. The results of the analysis is provided and discussed below.

4.2 MAIN FINDINGS

Africa consists of 54 countries (Worldatlas, 2015). Less than half (23 countries in total) of the countries benefitted from project finance transactions over the period 2000 to 2013. Projects in the 23 countries attracted debt to the value of around US\$ 74 billion over the period. South Africa, Egypt and Nigeria were the African countries that benefitted most from project finance transactions between 2000 and 2013, with transaction values of US\$22.3 bn, US\$14.8 bn and US\$10.2 bn respectively (see Table 4.1 below). The three African countries that benefitted the least over the period were Libya, Malawi and Ethiopia, with transaction values of US\$0.09 bn, US\$0.1 bn and US\$0.2 bn respectively. It is interesting to note that Ethiopia and Libya were amongst the highest growth countries, but had some of the lowest value of project finance over the study period. The volume of project finance transactions is, however, small when compared to the GDP of the recipient countries. When comparing the overall value of project finance transactions in the 23 countries (US\$ 74 billion) over the study period, with the total GDP of the same countries of around US\$ 16 139 billion, it can be seen that the value of the project finance transactions only amounted to around 0.5 per cent of total GDP. The three countries that showed the highest GDP over the study period is again South Africa, Nigeria and Egypt (which countries also attracted the most project finance transactions as was shown above). The value of project finance transactions to GDP in these countries are 0.57 per cent, 0.38 per cent and 0.73 per cent respectively. According to the World Bank Data (2015), out of the 23 countries forming part of the study, eight countries are classified as upper middle-income countries, seven as lower middle-income countries and eight as low-income countries.

Tables 4.2, 4.3 and 4.4 provide descriptive statistics for all 23 countries, the five highest growth countries and the five lowest growth countries respectively. When comparing the annual volume of project finance transactions in Africa, it is clear that the use of project finance has increased from

around US\$ 1.2 billion in 2000 to around US\$ 7 billion in 2013. The value of project finance transactions was at its highest during 2008 and 2012, with values of around US\$ 14.8 billion and US\$ 15.2 billion respectively. It is also evident from Tables 4.3 and 4.4 that higher-growth countries attracted more project finance.

Table 4.1: Project finance-growth relationship for the period 2000 to 2013

Country name	Country income classification (World Bank Data, 2015)	Mean Growth (%)	PF volume (real US\$ x million)	Mean PF (% real US\$ x million)
Gabon	Upper middle income	0.212769	564	0.215261
Cameroon	Lower middle income	1.046502	1 248	0.635688
Malawi	Low income	1.246199	145	0.205881
Kenya	Lower middle income	1.559665	1 308	0.252453
Mali	Low income	1.685984	253	0.504239
South Africa	Upper middle income	1.862886	22 349	0.571436
Algeria	Upper middle income	1.986483	4 751	0.249991
Egypt	Lower middle income	2.577357	14 845	0.729362
Burkina Faso	Low income	2.821458	250	0.264322
Tunisia	Upper middle income	2.931335	1 398	0.255139
Botswana	Upper middle income	2.96008	1 670	1.130666
Uganda	Low income	3.178182	492	0.551537
Morocco	Lower middle income	3.330512	2 481	0.205143
Mauritius	Upper middle income	3.352427	262	0.192569
Tanzania	Low income	3.814725	792	0.391206
Zambia	Lower middle income	4.074455	1 696	0.751948
Ghana	Lower middle income	4.104203	6 778	1.559789
Libya	Upper middle income	4.234792	89	0.008854
Mozambique	Low income	4.342680	971	0.707251
Nigeria	Lower middle income	5.157684	10 240	0.384311
Ethiopia	Low income	5.912857	230	0.050647
Angola	Upper middle income	6.018554	902	0.065024
Liberia	Low income	6.639700	240	0.878688

Source: Author, 2015.

Table 4.2: Descriptive statistics per year for all 23 countries

Year	PF volume (real US\$ x million)	Project finance in % of GDP		
		Mean	Standard deviation	Maximum
2000	1 212	0.219483	0.830615	3.927041
2001	1 812	0.145331	0.878887	6.228519
2002	2 933	0.282349	1.159406	7.477466
2003	645	0.055727	0.320671	2.228796
2004	1 800	0.124973	0.526224	3.344153
2005	2 689	0.057826	0.229751	1.370341
2006	5 007	0.052641	0.270753	1.660875
2007	4 543	0.208301	0.688964	3.700511
2008	14 760	0.309532	1.078687	6.928921
2009	8 871	0.539523	2.257389	14.495140
2010	3 856	0.101266	0.445340	2.695963
2011	3 667	0.181171	0.777848	5.345665
2012	15 188	0.268582	0.748032	4.490860
2013	6 971	0.372647	1.748590	12.301640

Source: Author, 2015.

Table 4.3: Descriptive statistics per year for five highest-growth countries

Year	PF volume (real US\$ x million)	Project finance in % of GDP		
		Mean	Standard deviation	Maximum
2000	-	-	-	-
2001	-	-	-	-
2002	1 477	0.499688	1.117337	2.498441
2003	104	0.445759	0.996748	2.228796
2004	120	0.027321	0.061091	0.136604
2005	870	0.155013	0.346621	0.775067
2006	-	-	-	-
2007	325	0.039050	0.087320	0.195252
2008	1 822	1.538129	3.019719	6.928921
2009	259	0.195883	0.309841	0.709058
2010	-	-	-	-
2011	501	0.064234	0.115756	0.267010
2012	5 562	0.248342	0.525777	1.187958
2013	1 543	2.627158	5.410872	12.301640

Source: Author, 2015.

Table 4.4: Descriptive statistics per year for five lowest-growth countries

Year	PF volume (real US\$ x million)	Project finance in % of GDP		
		Mean	Standard Deviation	Maximum
2000	127	0.801283	1.633801	3.715197
2001	600	1.245704	2.785478	6.228519
2002	-	-	-	-
2003	-	-	-	-
2004	213	0.732221	1.466551	3.344153
2005	-	-	-	-
2006	-	-	-	-
2007	552	0.376873	0.628193	1.448768
2008	213	0.118679	0.265374	0.593395
2009	250	0.633191	1.263294	2.882337
2010	-	-	-	-
2011	316	0.256104	0.419806	0.966627
2012	629	0.488503	0.536112	1.148857
2013	618	0.425309	0.676800	1.550908

Source: Author, 2015

Table 4.5 below provides detailed descriptive statistics for the variables used in the panel regressions. On average, the cumulative inflow of project finance amounted to 0.47 per cent compared to FDI inflow of around 4.5 per cent. It was, however, shown that the ratio of project finance to GDP in a recipient country remained small. Table 4.1 also illustrated that some countries experienced significant growth while the value of project finance in these countries remained low.

Table 4.5: Descriptive statistics of variables

Variable	Label	Mean	Std Dev	Min	25 th Pctl	50 th Pctl	75 th Pctl	Max
Growth	Growth (%)	3.26	8.10	-62.47	1.21	3.03	4.82	102.78
Initial GDP	Initial GDP per capita (real US\$)	1390.69	1670.76	124.84	236.10	406.12	2245.33	6548.57
PF perc	PF (% of GDP)	0.47	1.49	0	0	0	0.12	14.50
FDI perc	FDI (% of GDP)	4.55	8.90	-5.98	1.07	2.81	4.76	91.01
Schooling	Schooling (years)	4.07	1.85	0.91	3.05	3.76	5.44	8.28
PG	Population growth (%)	2.43	1.01	-2.63	1.67	2.63	3.01	6.68
GC	Government consumption (% of GDP)	82.03	19.59	32.18	75.95	83.88	91.22	187.53
Law	Law	28.60	20.73	0	9.13	27.38	44.98	82.69
Inflation	Inflation (%)	9.93	15.32	-32.81	2.84	6.39	12.64	142.48
Openness perc	Openness (% of GDP)	72.74	27.03	30.73	53.88	66.62	90.87	179.12

Source: Author, 2015.

The analysis followed a systematic process of removing insignificant variables in both the one-way and two-way fixed-effect models. The fit diagnostics of the one-way and two-way fixed-effects models were then compared to assess whether the time-effect plays a significant role in the fit of the model. Tables 4.6 and 4.8 present the one-way and two-way fixed-effects models. The adjusted r^2 value is included as an additional measure. Tables 4.7 and 4.9 present the correlations between the various parameters. A diagnostic plot for each of the two models is provided in Annexure A.

Table 4.6: Diagnostic summary of the one-way fixed-effects model

Step	Action	SSE	MSE	Root MSE	r^2	F-test	Adj r^2
1	Removed Ethiopia, Mali and Namibia	111.87	3.4959	1.8697	0.6357	0.4503	0.294169
2	Replaced countries, removed Schooling	126.4499	3.2423	1.8006	0.6545	0.0355	0.371013
3	Removed FDI	126.5593	3.164	1.7788	0.6542	0.0262	0.386205
4	Removed Initial GDP	127.3472	3.106	1.7624	0.652	0.0081	0.397366
5	Removed Intercept	127.3472	3.106	1.7624	0.652	0.0031	0.397366
6	Removed GC	128.6444	3.063	1.7501	0.6485	0.0026	0.405798
7	Removed Law	130.38	3.032	1.7413	0.6437	0.0020	0.411691

Source: Author, 2015.

Table 4.7: Correlations of parameter estimates of the one-way fixed-effects model

	PF	PG	Inflation	Openness
PF	1.00000	-0.08953	-0.07033	0.03111
PG	-0.08953	1.00000	0.08758	0.16627
Inflation	-0.07033	0.08758	1.00000	0.03179
Openness	0.03111	0.16627	0.03179	1.00000

Source: Author, 2015.

Table 4.8: Diagnostic summary of the two-way fixed-effects model

Step	Action	SSE	MSE	Root MSE	r^2	F-test	Adj r^2
1	Removed Ethiopia, Mali and Namibia	109.5791	3.6526	1.9112	0.6432	0.5611	0.262613
2	Replaced countries, removed Schooling	124.2405	3.3579	1.8324	0.6605	0.0633	0.348527
3	Removed FDI	125.0819	3.2916	1.8143	0.6582	0.0510	0.361374
4	Removed Initial GDP	126.0385	3.2318	1.7977	0.6556	0.0181	0.373015
5	Removed Intercept	126.0385	3.2318	1.7977	0.6556	0.0076	0.373015
6	Removed GC	127.6436	3.1911	1.7864	0.6512	0.0067	0.380880
7	Removed Law	130.2724	3.1774	1.7825	0.6440	0.0058	0.383512

Source: Author, 2015.

From Tables 4.6 and 4.8 it is shown that the additional α_i vector estimated for a time-fixed effect is not significant, and that the one-way fixed-effects model for the cross-sections (countries) only yields a better fit. The full set of estimated parameters for the model is presented in Table 4.10.

Table 4.9: Correlations of parameter estimates of the two-way fixed-effects model

	PF	PG	Inflation	Openness
PF	1.00000	-0.13179	-0.13235	0.12595
PG	-0.13179	1.00000	0.17202	0.09482
Inflation	-0.13235	0.17202	1.00000	-0.05827
Openness	0.12595	0.09482	-0.05827	1.00000

Source: Author, 2015.

Table 4.10: Parameter estimates

Variable	Estimate	Standard Error	t value	Pr > t	Label
CS1	-5.00254	7.4111	-0.68	0.5033	Cross sectional effect 1
CS2	-3.11613	8.2846	-0.38	0.7087	Cross sectional effect 2
CS3	-5.61394	7.9294	-0.71	0.4828	Cross sectional effect 3
CS4	-2.65833	6.5795	-0.40	0.6882	Cross sectional effect 4
CS5	-5.08968	6.7144	-0.76	0.4526	Cross sectional effect 5
CS6	-4.31646	6.9417	-0.62	0.5373	Cross sectional effect 6
CS7	1.07445	6.7542	0.16	0.8744	Cross sectional effect 7
CS8	-6.87914	7.9590	-0.86	0.3922	Cross sectional effect 8
CS9	-4.01114	7.9077	-0.51	0.6146	Cross sectional effect 9
CS10	-4.06085	7.1817	-0.57	0.5747	Cross sectional effect 10
CS11	-0.93697	8.3283	-0.11	0.9109	Cross sectional effect 11
CS12	-4.10879	7.8831	-0.52	0.6049	Cross sectional effect 12
CS13	-6.53483	7.4865	-0.87	0.3876	Cross sectional effect 13
CS14	-5.01326	7.4484	-0.67	0.5045	Cross sectional effect 14
CS15	-4.43604	8.4341	-0.53	0.6016	Cross sectional effect 15
CS16	-2.90112	7.6586	-0.38	0.7067	Cross sectional effect 16
CS17	1.75474	7.6520	-0.23	0.8197	Cross sectional effect 17
CS18	-3.64583	8.1638	-0.45	0.6574	Cross sectional effect 18
CS19	-0.49379	7.2295	-0.07	0.9459	Cross sectional effect 19
CS20	-5.05137	7.2142	-0.70	0.4876	Cross sectional effect 20
CS21	-2.82323	7.0913	-0.40	0.6925	Cross sectional effect 21
CS22	-5.06788	8.0022	-0.63	0.5299	Cross sectional effect 22
CS23	-2.96034	6.8524	-0.43	0.6679	Cross sectional effect 23
CS24	-3.08691	7.4070	-0.42	0.6789	Cross sectional effect 24
PF	0.790896	0.3539	2.23	0.0307	
PG	-1.39942	0.4975	-2.81	0.0074	
Inflation	-0.87849	0.4200	-2.09	0.0424	
Openness	2.84282	1.6553	1.72	0.0931	

Source: Author, 2015

For completeness, a one-way random-effects model was also fitted to the data. The same model that was developed for the fixed-effect models was used, but now assuming a random cross-sectional effect, instead of a fixed-cross-sectional effect. The model fit statistics are shown in Table 4.11.

Table 4.11: Model fit statistics for a one-way random-effects model

SSE	MSE	r^2	DFE	Root MSE
144.4694	2.1563	0.4052	67	1.4684

Source: Author, 2015.

Although the mean squared error (MSE) and root MSE values are smaller than that of the one-way fixed-effects model, the sum of squared errors (SSE) and r^2 values are larger and smaller respectively, which indicate that the fit has not improved. The corresponding adjusted r^2 value is 0.017888, which is much smaller than the 0.411691 for the comparative fixed-effects model.

The Hausman test for random effects indicates that the random-effects model is valid (because of the large p-value, the null hypothesis cannot be rejected).

Table 4.12: Hausman test for random effects

DF	m value	Pr > m
4	0.43	0.9802

Source: Author, 2015.

The Breusch-Pagan test comes to the same conclusion (because of the small p-value, the null hypothesis of no random effects is rejected).

Table 4.13: Breusch Pagan test for random effects (one way)

DF	m value	Pr > m
1	6.84	0.0089

Source: Author, 2015.

Under the one-way random-effects model, the model parameters are presented in Table 4.14.

Table 4.14: Parameter estimates for one-way random-effects model

Variable	Estimate	Standard error	t value	Pr > t
PF	0.780659	0.2942	2.65	0.0100
PG	-1.39002	0.3884	-3.58	0.0006
Inflation	-0.85213	0.3435	-2.48	0.0156
Openness	1.964547	0.3357	5.85	<0.0001

Source: Author, 2015.

A two-stage dynamic panel was also estimated, using generalised method of moments (GMM), to ensure that the possible endogeneity issues that may arise are accounted for. Following Kleimeier and Versteeg (2010), two instruments were incorporated: PF (Project Finance) and Inflation were used along with their two lags, and in addition, a constant 'intercept' term, and the dependent variable itself. The model fit statistics are shown in Table 4.15.

Table 4.15: Model fit statistics for a two-stage dynamic panel

SSE	MSE	DFE	Root MSE
116.7750	6.1461	19	2.4791

Source: Author, 2015.

The Sargan test indicates that this model is also valid (because of the large p-value) as shown in Table 4.16.

Table 4.16: Sargan test

DF	Statistic	Prob > ChiSq
39	18.52	0.9978

Source: Author, 2015.

The model parameters and their associated p-values are shown in Table 4.17.

Table 4.17: Parameter estimates for two-stage dynamic panel model

Variable	Estimate	Standard error	t value	Pr > t
PF	0.644383	0.0873	7.38	<0.0001
PG	-1.88654	0.3055	-6.18	<0.0001
Inflation	-0.62731	0.0376	-16.68	<0.0001
Openness	2.151087	0.2032	10.59	<0.0001

Source: Author, 2015.

The conclusion is similar to that of Kleimeier and Versteeg (2010), in that a valid model may still be obtained, even after making absolutely sure that the endogeneity is accounted for.

The one-way fixed-effects model provided the best fit, with Project Finance, Population Growth, Inflation, and Openness as regressor variables. Of these, the second most influential variable (after Openness) proved to be Project Finance.

4.3 SUMMARY

An empirical analysis was done making use of secondary data. A standard panel regression model was used to determine whether project finance has an impact on economic growth in the sample countries over the 14-year period. Both a one-way and two-way fixed-effect model was analysed using three panels. The analysis eliminated various countries from the initial group of

African countries due to the unavailability of data and concentrated on a sample of 23 African countries. The results of the analysis proves that Project Finance is the second most influential variable and that it did contribute towards economic growth in the sample countries over the study period.

The next chapter provides a summary, conclusion and recommendations of the research assignment.

CHAPTER 5

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

In this study, the finance-growth nexus was investigated, with a specific focus on project finance. It was shown that foreign capital flow into a country is often a function of the level of development of the financial system in that country. Project finance as a specific financing mechanism is particularly successful in attracting local and foreign capital to projects in perceived riskier markets, i.e. growing economies with weak or underdeveloped financial, legal, institutional and governance systems. Project finance is, therefore, an effective tool to finance projects in high-risk environments.

Financial development contributes to both the quality and quantity of capital available in the financial markets. However, it is the 'quality of capital' that contributes towards and influences the economic growth and development in an economy.

5.2 SUMMARY OF MAIN FINDINGS

Fixed-effects models were developed for modelling growth in African countries, as measured by the log change in GDP. The one-way fixed-effects model provided the best fit, with Project Finance, Population Growth, Inflation, and Openness as regressor variables. Of these, the second most influential variable (after Openness) proved to be Project Finance. A one-way random-effects model was also developed, but although valid, proved to have a poorer fit than that of the fixed-effects model. A dynamic panel was used to assess the effect that possible endogeneity may have on the model. For this, the coefficient for PF lowered from 0.790896 to 0.644383.

If all other model inputs are held constant at c , then the estimated coefficient of PF acts as a slope parameter in a straight-line formula. An increase of one per cent in the aggregated (over three years) value of PF, as a percentage of the aggregated (over three years) value of log change in GDP, will have a 0.79 per cent increase in the average growth for that same three year period.

The results of this study are consistent with the literature and the findings of Kleimeier and Versteeg (2010), and imply that project finance fosters economic growth. Kleimeier and Versteeg (2010) specifically found that the effect of project finance was more profound in low-income countries compared to middle and high-income countries. It was shown in this study, which comprised low income, lower middle-income and upper middle-income countries that project finance did contribute towards economic growth in the sample countries. This proves significant given the specific challenges faced by the African continent in order to realise the growth opportunities experienced over the past decade.

The importance of project finance for economies in Africa should, therefore, not be underestimated. Not only does project finance provide a mechanism to finance large-scale infrastructure (which is often the only financing mechanism available), but at the same time contributes towards economic growth in a country. Improved economic growth will in turn lead to a reduction in poverty and inequality and will contribute to the much-needed human capital development on the African continent.

Although project finance is a complex financing mechanism, it is particularly successful in countries with weak financial and legal systems. The use of project finance should be encouraged by governments in Africa for the provision of public infrastructure. Project finance as an alternative financing mechanism can play an important role in eradicating infrastructure backlogs on the African continent. Policy changes should create an enabling environment conducive to and promoting project finance as a preferred financing mechanism in African countries.

5.3 POLICY IMPLICATIONS

5.3.1 Africa

Sawant (2010) found in a study conducted on the economics of large-scale infrastructure investment that “host governments can reduce the costs of project finance by implementing a stable policy environment for project finance investments”. In a study conducted on infrastructure finance in developing countries, Estache (2010) found that one of the main challenges to improve service delivery was “the inability of reforms to address the complex institutional and political characteristics of the infrastructure sector”.

It is, therefore, important for governments in Africa to encourage the use of project finance as a mechanism to finance infrastructure by creating an enabling environment for the use of project finance. Although project finance can be used in emerging markets and underdeveloped economies, political support for the use of project finance is essential. Without a willingness by governments to use project finance as a financing mechanism, the use of project finance will not yield the intended results.

The following policy considerations will contribute towards creating an enabling environment for the use of project finance:

- Support the notion of the private sector investing in, and sharing in the risk and profits of providing infrastructure;
- Support the establishment of special purpose vehicles;
- Consider legislation that will streamline and simplify the legal environment to support the use of project finance without compromising on best practice and the rule of law;
- Support the ‘user pays’ principle, encourage society to pay for services and encourage appropriate cost recovery mechanisms;

- Establish a project preparation environment where projects are properly prepared, structured and 'de-risked' to ensure bankability; and
- Create capacity within the public sector by providing training, skills development, and ensuring continuity at official level.

It is further important for governments in Africa to consider and employ appropriate activities to prepare projects and progress these projects to bankability. Such project preparation activities should aim to successfully 'de-risk' projects in order to make them attractive for commercial banks, development finance institutions and other funders to invest in the projects.

5.3.2 South Africa

It was mentioned above that South Africa is also facing significant infrastructure backlogs with simultaneous pressure on the public sector responsible for the provision of the required infrastructure. South Africa is in search of alternative funding sources and the involvement of the private sector would relieve the pressure on the public finances.

Project finance provides a real solution to the problem. While project finance will enable the provision of much needed infrastructure, it will, at the same time, contribute towards economic growth in South Africa as was shown in this study. The South African government should, therefore, consider project finance as an alternative financing mechanism, which can specifically be applied to the trading services in the municipal environment, for example water supply, sanitation, electricity and solid waste removal. South Africa is facing looming water shortages and the municipal water services (water supply and sanitation services) sector requires critical interventions. South African municipalities are primarily responsible for the provision of water services. These municipalities are, however, facing increasing balance sheet lending constraints and are consequently struggling to provide the required services and to meet the increasing demands. It is specifically in this sector where the benefits of project finance can be maximised.

Project finance, however, is often incorrectly viewed as being synonymous with privatisation. This misconception ultimately leads to strong resistance from civil society, labour unions, etc., especially with the provision of potable water supply being an essential service. Project finance should, however, not be confused with privatisation as it is possible to apply the principles of project finance in the public sector without relinquishing ownership and control to the private sector.

The success of project finance in South Africa (and specifically in the municipal environment) is dependent on the following factors:

- The political will to employ project finance for the provision of public infrastructure;
- Application of the 'user pays' principle and the will to enforce the necessary cost recovery;
- Cross-subsidisation between the rich and the poor to account for economic vs. social projects;

- Consolidation and gearing of grant funding (to unlock commercial funding and ensure affordability);
- Capacity, expertise and continuity of municipal officials at local government level; and
- Acceptance and support by organised labour of the use of project finance.

5.4 RECOMMENDATIONS

It is recommended that governments throughout Africa take notice of the benefits of project finance in the provision of infrastructure and the way in which it contributes towards economic growth. It is important for governments to provide the enabling environment to support the use of project finance. By creating a friendly and conducive environment for the use of project finance, governments will be able to attract foreign capital to perceived high-risk environments, which would otherwise not receive quality capital investments. This will relieve the pressure on the public sector for the provision of infrastructure, which will in turn support economic growth.

Governments should make the necessary policy changes to ensure the successful implementation of project finance. Policy changes may include amendments to existing legislation to facilitate the establishment of special purpose vehicles, changes to the legal system governing the public sector, changes to procurement systems and the manner in which unsolicited bids are considered, and strengthening public sector institutional capacity.

By creating a conducive policy and regulatory environment, governments will be able to create international best practice and attract foreign investors to invest in much needed infrastructure in Africa.

5.5 FURTHER RESEARCH

This research has shown that project finance in general serves as a driver of economic growth in African economies. Future research can focus on:

- Appropriate project preparation methodologies to effectively structure projects for project finance transactions;
- Determining whether there are specific sectors in which project finance are more successful than others; and
- Determining the key bottlenecks that impact on the application of project finance in the municipal sector in South Africa.

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APPENDIX A: DIAGNOSTIC PLOTS

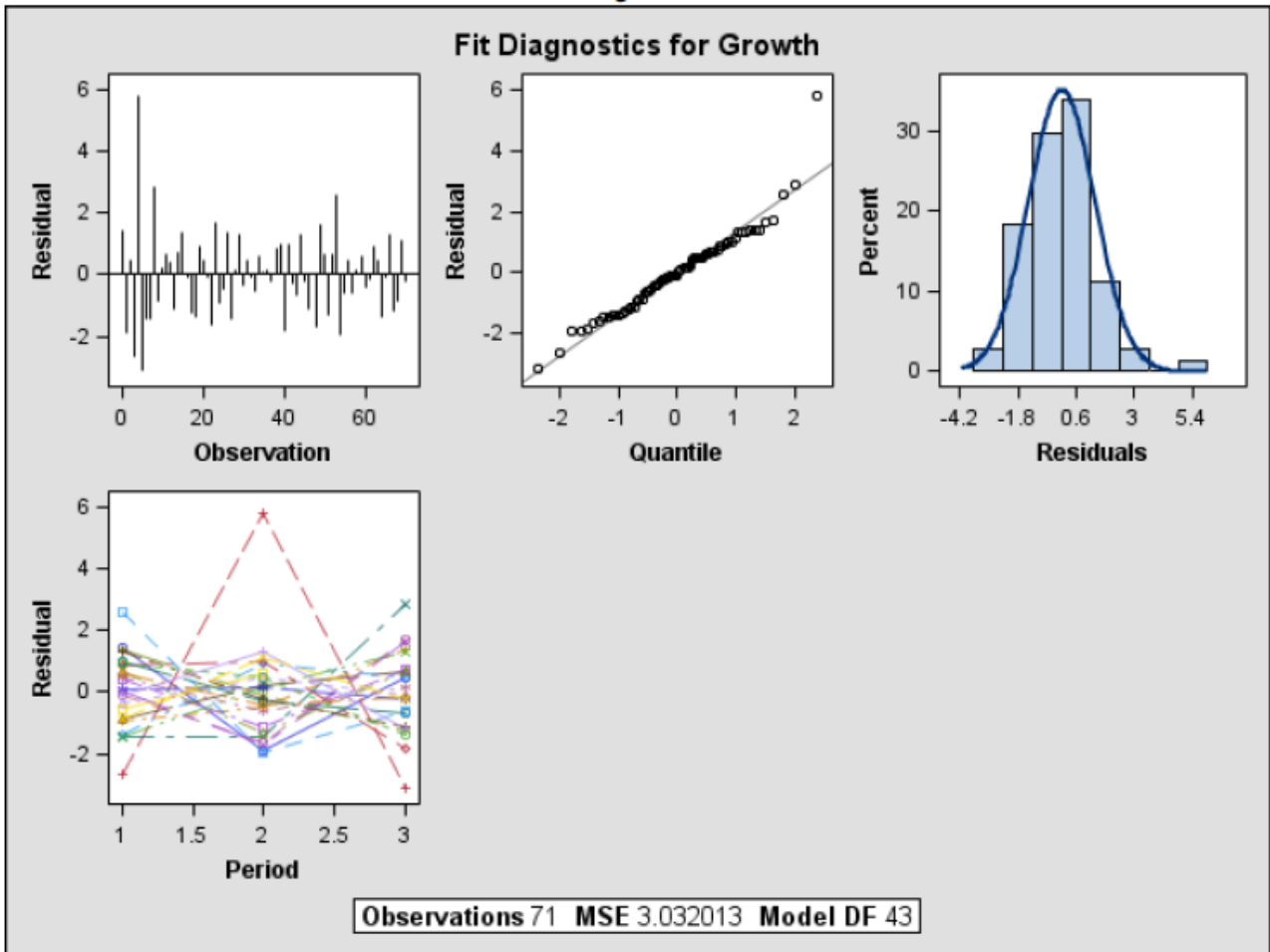


Figure A.1: Diagnostic plot for the one-way fixed-effects model

Source: Auhtor, 2015.

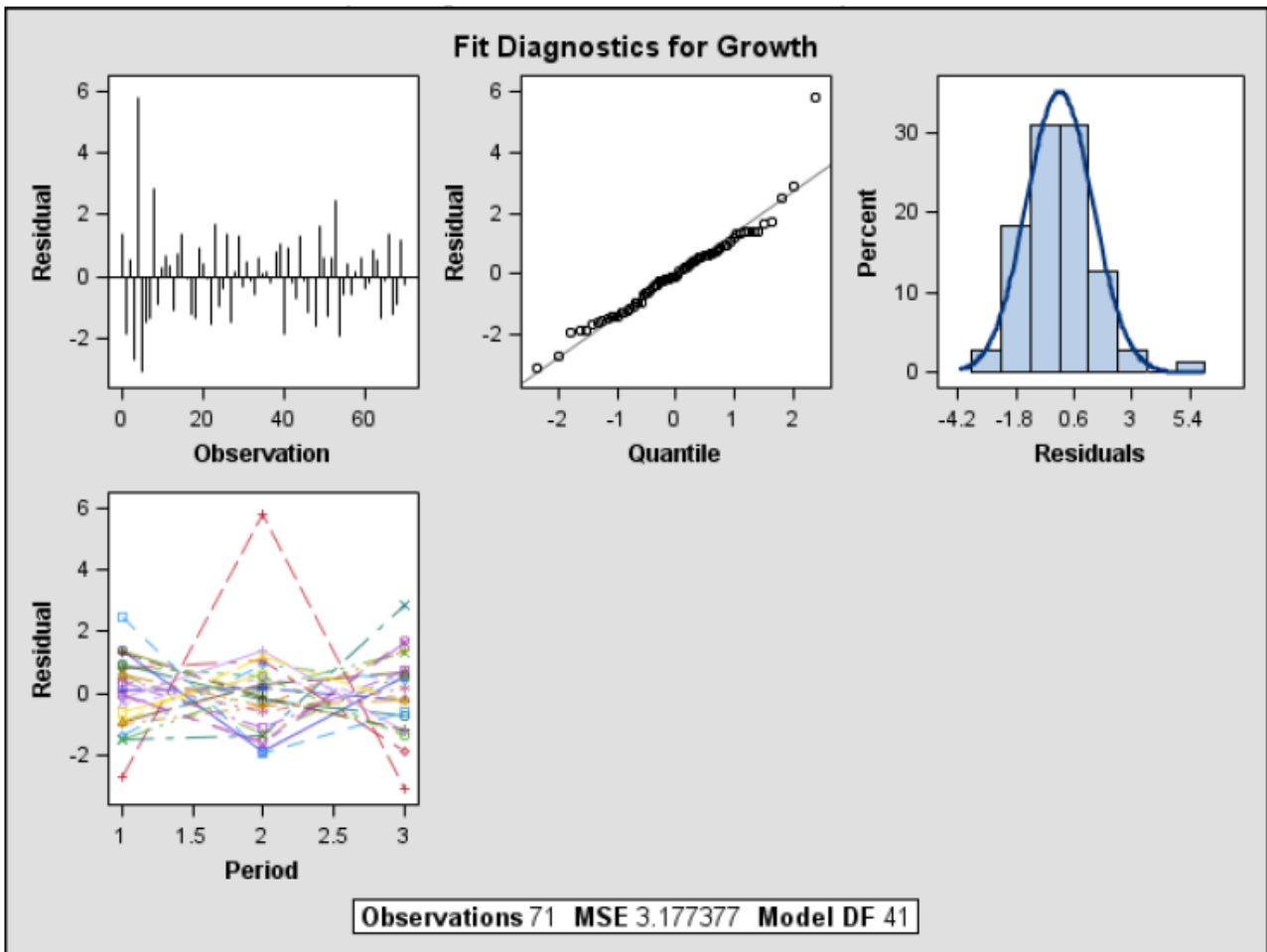


Figure A.2: Diagnostic plot for the two-way fixed-effects model

Source: Auhtor, 2015.

The correlation pattern is changed somewhat as compared to the one-way fixed-effects model however, none of these correlations are particularly large.