South African National Infrastructure Development Plan: Assessing the investment case for pension fund participation.

Douglas Davids[1] and Nthabiseng Moleko[2]

—Abstract —

The role the private sector, via pension funds, can play in funding infrastructure investment opportunities has not been extensively researched in emerging economies. The growth of pension fund assets within many African countries and the growing need for alternative forms of investment in infrastructure projects remains an investment opportunity and the subsequent economic contribution resulting from these investments likely significant. Despite this, there remains a paucity of empirical studies focusing on the role of African pension funds' participation in infrastructure projects and the subsequent economic benefits derived from these investments.

The use of non-probability convenience sampling research approach this paper assessed pension funds portfolio contribution through infrastructure investment. The findings concluded that apart from the economic and social benefits derived from infrastructure investment, the inclusion of infrastructure assets in a pension fund's portfolio contributes positively to the fund. Infrastructure assets are a stable low-risk form of investment, which provides investors with stable cash flows while providing the portfolio with risk-diversification benefits. The research concludes that the National Infrastructure Development Plan presents the ideal collaborative investment opportunity between government and the private sector which will contribute to the economic growth of South Africa.

Keywords: *Infrastructure Investing, Pension Funds, National Infrastructure Development Plan, Social and Economic growth*

[1] ddavids@mweb.co.za, University of Stellenbosch Business School, South Africa

[2] nthabisengm@usb.ac.za, University of Stellenbosch Business School, South Africa,

1. **Introduction**

The post-apartheid South African government essentially inherited infrastructure stock that was disproportionately positioned to serve the needs of the minority. Pillay, Tomlinson and Du Toit (2006) stated that "South African cities were characterised by dire housing and service backlogs, inequalities in municipal expenditure, the spatial anomalies associated with "apartheid" cities, high unemployment and many poverty-stricken households". Several strategic initiatives by the post-apartheid government to address these historical imbalances have been initiated over the past 20 years. Strategic national initiatives include the Reconstruction and Development Plan (RDP) programme in 1994, the Growth, Employment and Redistribution (GEAR) strategy in 1996, the Accelerated and Shared Growth Initiative for South Africa *(*ASGISA) in 2006, the New Growth Path (NGP) in 2010 and, most recently, the National Development Plan (NDP) in 2012. Strategic initiatives at a more localised level include the Urban Development Strategy in 1997, the Rural Development Framework in 1999, the Municipal Integrated Development Plan and the Breaking New Ground housing policy of 2004. The underlying aim of all these initiatives was to stimulate economic growth, address the high levels of unemployment and reduce poverty.

In April 2010, President of South Africa appointed a National Planning Commission (NPC), which had as its mandate "to take a broad, cross-cutting independent and critical view of South Africa, to help define the South Africa we seek to achieve in 20 years and to map out a path to achieve these objectives" (NPC, 2011). In June 2011, the NPC released its diagnostic report, which set out South Africa's failures and shortcomings since 1994. The report identified the failure to implement various policies and an absence of broad partnerships as the reasons for the slow progress in eliminating poverty and reducing inequality. The report set out nine primary challenges that impacted the rate of growth negatively, namely: - poor education outcomes; high disease burden; divided communities; public services performance is uneven; spatial patterns marginalise the poor; too few South Africans are employed; corruption; resource intensive economy; and crumbling infrastructure. The outcome of this diagnostic report led to the development of the National Development Plan (NDP). The main objective of the NDP was to design a road map to eliminate poverty and reduce inequality in South Africa by 2030. The NDP asked for a major change in how South Africans go about their daily lives. The NDP (2011) aptly stated:

> *In the past we expected government to do the things for us. What South Africa needs is for all of us to be active citizens and to work together – government, business*

> *and community – so that people have what they need to live the lives they would like*.

While the NDP states its intended objectives, it does not provide a concrete implementation plan on how these objectives are to be met. The following statement by the chair of the NPC (NPC, 2011) best captures this position: "Learning as we implement allows us an opportunity to get better at implementing rather than become better at planning". The NDP proposes to create 11 million jobs by 2030 in a variety of methods including promotion employment in labour absorbing industries; raising exports and competitiveness; creating environment for inclusive growth and mobilization of all sectors of society towards the national vision.

Infrastructure development is a central aspect of the NDP. The NPC identified 18 strategic integrated projects (SIPs). These 18 SIPs are clusters of infrastructure projects deemed to be key to driving economic growth through which unemployment and poverty alleviation would be addressed in South Africa.

The aim of these strategic investments is to rectify inequalities and inefficiencies in the existing infrastructure by improving and maintaining the current infrastructure environment that will stimulate economic growth and job creation. This infrastructure network will improve service delivery to the poor with positive effects on the eradication of poverty.

Empirical research has shown that infrastructure investing has a positive impact on investment and economic growth in Africa (Allen & Ndikumana, 2000). Banks, which have been the traditional sources of infrastructure funding within many African countries, are unable to continue to provide the resources to meet the continued infrastructure investment needs of Africa due to the legaslitive changes restricting the use of its avaliable capital. In Africa, to continue along its development path it is important to explore alternative sources of funding. South Africa's historical social imbalance and the need to address social and economic imbalances continue to place significant strain on the government's available financial resources. It has become a major challenge for the South African government to distribute its available financial resources adequately between social and infrastructure needs. One possible source of funding is the pension fund industry. Kaniki (2010) argued that pension funds are an underdeveloped source of domestic finance, with the potential to play a significant role in meeting long-term investment needs on the African continent.

2. South African economic overview

The South African economy showed signs of steady growth from the start of the new millennium to around 2008 with an average growth rate of around 4.3 percent, as seen in Figure 1. The effects of the global economic crisis in 2008 filtered into the South African economy during 2009, resulting in a negative GDP growth rate of minus 1.5 percent. While South African financial institutions remained mostly unaffected by the global financial fall-out, the economy was impacted by the slow-down in exports, due to recessionary economic conditions experienced by many of South Africa's economic trading partners. For the period 2010 to 2015, South Africa saw a steady decline in its GDP, from 3.1 percent in 2010 to a level of 1.3 percent in 2015. GDP growth rate for 2016 as provided by Stats SA was closer to the zero-percentage level (Statistics SA, 2017). Following the release of two consecutive quarterly negative growth rates – 0.7 percent for the first quarter of 2017, combined with the 0.3 percent contraction during the fourth quarter of 2016 – pointed South Africa towards an entry into a recession. The economy however managed to recover during the second half of the year resulting in an annual GDP growth rate of 1.3% for 2017.

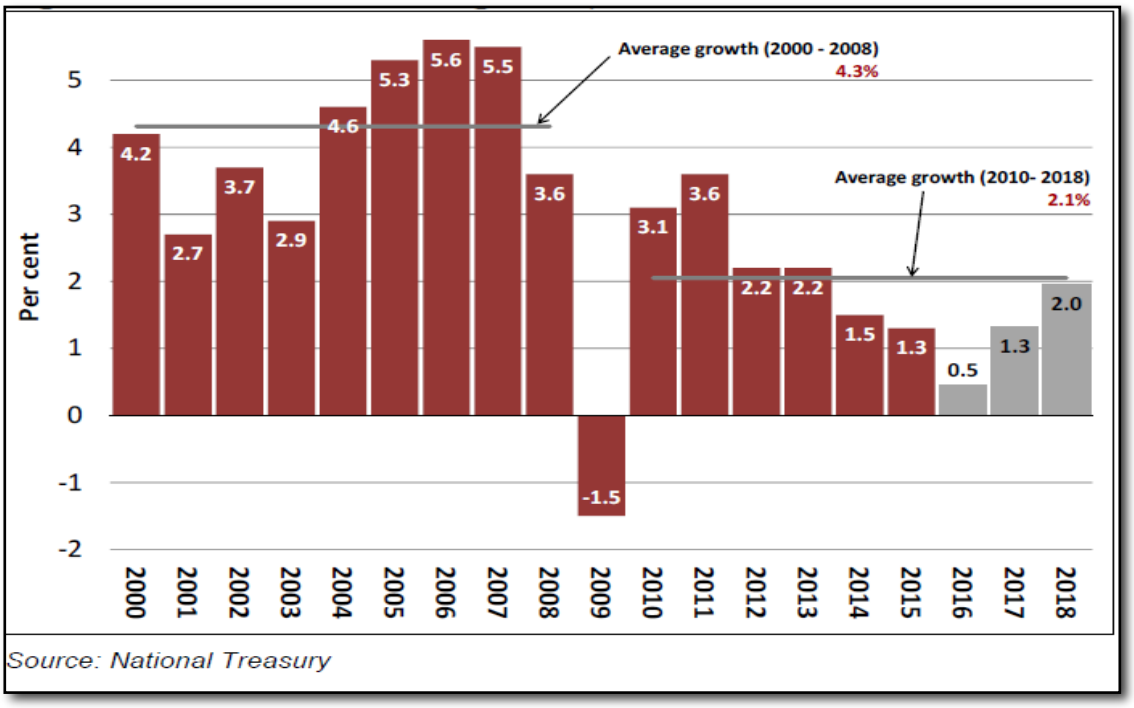


Figure 1: GDP growth rate

Source: National Treasury

The need for prioritising unemployment as part of the NDP is highlighted in Figure 2 and Figure 3 below. Total unemployment rate in South Africa during the first quarter of 2017

increased to 27.7 percent, up from 26.5 percent the previous quarter (see Figure 2). The 2017 unemployment rate is the highest it has been since 2004. The unemployment rate in South Africa was on average 25.4 percent for the period from 2000 to 2017, with an all-time high of 31.2 percent during the first quarter of 2003. The lowest rate of unemployment seen during this period was during the fourth quarter of 2008, at 21.5 percent.

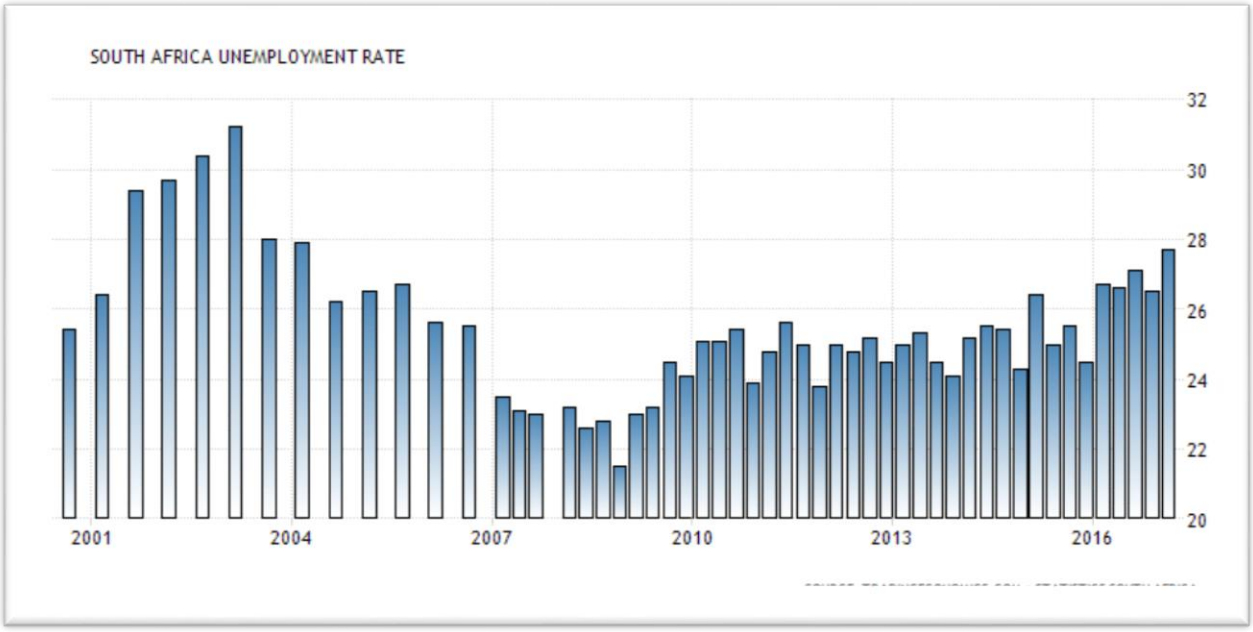


Figure 2: Total unemployment rate

Source: Stats SA, 2017.

Youth unemployment rates remain stubbornly high when compared to international norms. In South Africa, youth unemployment rates reduced during the fourth quarter of 2016 to a level of 50.9 percent, down from 54.2 percent during the third quarter of 2016 (see Figure 3). During the four year period from the start of 2013 to the fourth quarter of 2016, youth unemployment rates have remained well above the 50 percent level, with the average for the period being 51.5 percent. The unemployment rate for this period reached a high of 54.5 percent during the first quarter of 2016 and a low of 48.8 percent during the fourth quarter of 2014. The challenge faced by the greater proportion of the unemployed youth is the lack of formal skills. A large number of unemployed youths do not have any formal education beyond grade 12. The consequence is that young job seekers with post-secondary qualifications tend to have a much better chance of finding sustainable employment. The risk to the country is that these high levels of unemployment could lead to social unrest, which ultimately can lead to heightened political instability. If unemployment is not addressed in a sustainable manner, South Africa

faces the risk of creating a cycle of chronic employment. These young people will become parents whose children will grow up in an environment where unemployment is seen as the norm, thereby creating an intergenerational poverty environment.

Figure 3: Youth unemployment rate

Source: Stats SA, 2017.

Total infrastructure investment spending in South Africa fell from an average of almost 30 percent of GDP in the early 1980s to about 16 percent by the early 2000s (SA National Treasury, 2015). Similarly, public infrastructure spending is at low levels by historical standards. South Africa significantly reduced capital investment over the last two decades, specifically in roads, rail, ports, electricity, water sanitation, public transport and housing. In recent years, the public sector has favoured consumption over investment. The government's 2017 Medium Term Budget Policy Statement acknowledges this and signified a shift in the composition of expenditure towards socially orientated investment (National Treasury, 2017).

While private sector investment in infrastructure assets is a function of current and projected growth and profitability expectations, such investment is also a function of mutual trust and confidence in economic policies. The lack of private sector confidence following the 2008 global financial crisis has manifested itself in the reduction in private sector infrastructure investment spending (Figure 4 and Figure 5).

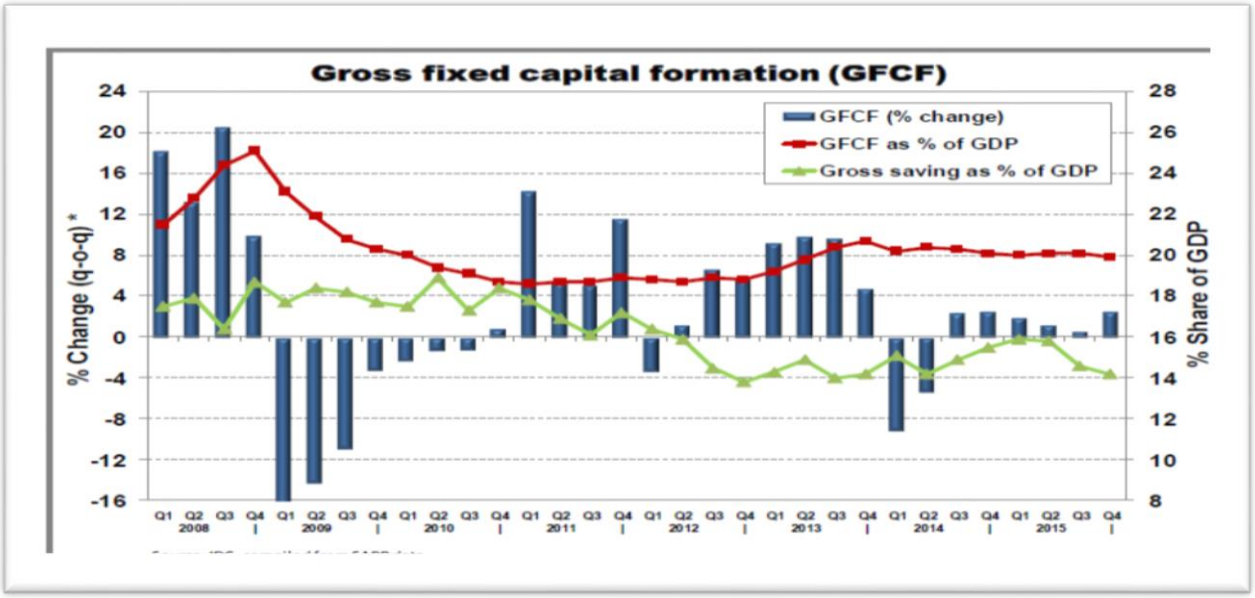


Figure 4: Infrastructure investment as percentage of GDP

Source: SARB, 2017.

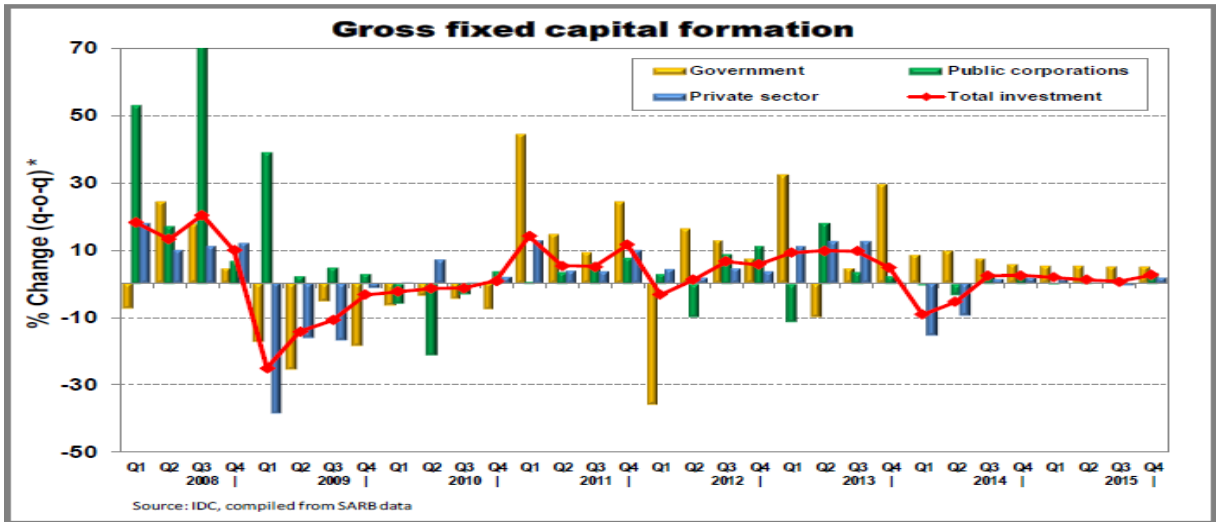


Figure 5: Infrastructure spending by type

Source: IDC, SARB 2017

3. Empirical literature review

The failure to provide modern and efficient infrastructure can be considered one of the biggest obstacles to economic growth across Africa (Fedderke & Garlick, 2008; Della Croce, 2011; KPMG, 2016). OECD countries as well as emerging economies such as India, China Brazil and South Africa are constantly highlighting the need for improved infrastructure to ensure economic growth and the drive to remain globally competitive. Africa's infrastructure investment needs are further negatively impacted by the extent to which funding required for many infrastructure developments have grown beyond the means of many governments on the African continent. Not only is there a need to maintain and upgrade existing infrastructure, an aging population, migration and urbanisation are all factors impacting the reliability and availability of infrastructure assets.

The relationship between economic growth and infrastructure investing remains an important economic topic amongst academics and policy makers. Scholars and policy makers are in agreement that a positive correlation exists between economic growth and infrastructure development (Fedderke & Bogetic, 2006; Beeferman, 2008; Kularatne, 2006; Della Croce, 2011). Empirical research concluded that infrastructure investing has a positive impact on investment and economic growth in Africa (Allen & Ndikumana, 2000). Infrastructure development holds significant benefits for an economy. Kodongo (2013) stated that infrastructure provides services that form part of residents' consumption bundle and augments capital and labour as an input to the production process (Kodongo, 2013). Stanley (2011) further stated that maintaining and building infrastructure that provides collective benefit is critical for economic growth.

Internationally, pension funds have traditionally invested in infrastructure assets through listed companies and fixed income instruments. It's only been in the last two decades that institutional investors have been investing in infrastructure assets through unlisted investment instruments. One of the driving forces behind the move towards direct infrastructure investment is that empirical research identified that listed infrastructure instruments tend to move in line with listed equity markets (Latham, 2008). Empirical research confirmed that unlisted infrastructure investment instruments, while being illiquid, can offer diversification to pension fund portfolios as their investment performance tends to react differently to that of listed investment instruments (Latham, 2008; Della Croce, 2012)

While international pension funds have been investing in infrastructure since the mid-1990s, Australian and Canadian pension funds seem to be the exception to the global average with regard to the extent of investing. Australian pension funds have been investing in infrastructure since the early 1990s, driven mainly by the privatisation of a number of large-scale infrastructure assets. These assets were primarily in the energy, transport and the communications sectors. Canadian pension funds have been investing since the mid-2000s. The main driver for the growth in Canadian pension fund investing in infrastructure was the launch of project PPP Canada in 2008. This project saw the coming together of federal government, provisional government and the private sector to support a greater adoption of public-private partnerships in infrastructure procurement. The result is that these two countries have the highest asset allocation of dedicated infrastructure investment by pension funds, at a level of close to 5 percent against a global average of 1 percent (Inderst, 2014)

Infrastructure assets are diverse assets with very different physical characteristics. The construction of a toll road has totally different requirements to the construction of solar energy power-generating facility. Even within the same asset types there can be significantly different characteristics. The construction of a toll road connecting two major cities has a totally different structural profile to that of a road connecting two cities with low population densities. Apart from having different types of infrastructure assets, investors also need to be aware of the asset as either being a greenfield or an existing (brownfield) project, whether the investor will invest in the equity or the debt or a combination of these investment classes, or if the investment is a direct investment or through an indirect investment vehicle. Given the wide range of investment approaches, it is imperative that these investment approaches are applied within the clearly defined investment frameworks of the pension fund.

As with any type of investment class, there are positives and negatives associated with pension fund investing in infrastructure. The positives for pension funds include stable cash flows, the long-term nature of the asset, which allows for liability matching as well as diversification benefits. The negative factors associated with infrastructure investing include the associated regulatory environment, especially the possibility of political interference in the management of the asset. Furthermore, infrastructure assets come with inherent risks such as political, regulatory, construction, liquidity as well as credit risk.

Research literature provides a number of reasons why pension funds should invest in infrastructure assets (Andrews & Wahba, 2007; Weber & Alfen, 2010; Sawant, 2010). The reasons can be grouped into six principles:

- The long-term maturity profile of infrastructure assets fits neatly in the long-term profile of pension funds.
- Due to infrastructure assets' monopolistic or oligopolistic nature, these assets tend to have more stable asset values.
- Unlisted infrastructure assets have a lower correlation with other asset classes.
- The regulatory framework governing the operational environment of infrastructure assets provides a natural inflation hedge.
- Previous infrastructure investments have provided investors with an acceptable risk–return profile.
- Infrastructure assets generally have stable cash flows.

Economists generally describe economic growth as a function of goods and services produced based on production inputs. Economic growth can be viewed both from a demand-side perspective and a supply-side perspective. Demand-side economic growth is defined as "a macroeconomic theory which argues that economic growth is most effectively created by high demand for products and services" (Investopedia, Investopedia, 2015). Demand-side economic growth, which is also known as Keynesian economics, developed in response to the great depression when conventional supply-side economics failed to explain why the mechanics of the free market were seemingly unable to restore balance to the economy as expected. Supply-side economic growth is defined as "a macroeconomic theory that argues economic growth can be most effectively created by investing in capital and by lowering barriers on the production of goods and services" (Investopedia, Investopedia, 2015).

In the study four linkages based on the supply-side growth theory have been identified where infrastructure can form part of the economic growth model. First, infrastructure can be regarded as a direct input into the production process. The generating of power is an example where infrastructure can be seen as a direct input factor. Secondly infrastructure can be a component of other factors. An improvement in the surrounding infrastructure can lead to a reduction in production cost. An example could be the improvement of a road leading to the production site. Thirdly infrastructure can be a stimulus for aggregated demand. While the production factors consider the aggregated growth in production, each of these factors of production is itself an outcome of a specific production process. Labour is one of the factors of production. The improvement in the infrastructure in the form of a school is likely to be an important determinant in the labour production factor. Finally infrastructure can be used as a policy tool

to drive economic growth. In an attempt to drive private sector investment into a specific area, government can either invest in or provide incentives for infrastructure investment.

During the 1990s a number of South African research studies were undertaken with the objective of determining the relationship between infrastructure development and economic growth. Abedian & Van Seventer (1995), using public sector infrastructure financial measures, concluded that the output elasticity from the infrastructure–growth relationship was between 0.17 and 0.33, with an economic rate of return between 0.2 and 0.23. Stated differently, for every 1 percent invested in infrastructure, the economy grew by between 1.17 percent and 1.33 percent with an economic return of between 1.2 percent and 1.23 percent. A similar conclusion was reached by Coetzee & Le Roux (1998), determining an output elasticity from the infrastructure–growth relationship of 0.3 and an economic rate of return of 0.24. The Development Bank of South Africa (1998) reached a similar conclusion, with an output elasticity of between 0.15 and 0.3, and an economic rate of return between 0.11 and 0.9 with infrastructure investment impact on output. At the start of the 2000s South African empirical research firmly supported the view that infrastructure development positively impacts economic growth. These findings were soon challenged.

In a series of South African studies, Perkins, Fedderke and Luiz (2005) concluded that the strength of the relationship between infrastructure investment and output varied across different infrastructure measures, thus:

- Aggregated public-sector investment and public-sector fixed infrastructure drive GDP.
- Roads infrastructure drives GDP.
- GDP drives ports freight handling levels and airport passenger levels.
- The direction was inconclusive for measures of railway, power generation and telecommunication infrastructure.

Building on this research, Fedderke and Bogetic (2006) investigated the relationship between GDP growth and a wider range of infrastructure measures for the period between 1875 and 2001. The research concluded that a rise in infrastructure stock encourages investment in fixed capital, which subsequently drives economic growth. Infrastructure stock had a positive elasticity to fixed capital investment of 1.06 percent for every 1 percent invested, and that infrastructure investment had a positive elasticity to fixed capital investment of 1.37 percent for every 1 percent infrastructure investment made. The research study further concluded that road infrastructure investment drives GDP growth while infrastructure stock such as

telecommunication, ports and airport infrastructure are driven by GDP growth. Electricity generation is positively correlated to GDP growth with an elasticity of 0.2.

Kularatne (2006) investigated both economic and social infrastructure and tested for directional causality, as well as examining the relationship between two measures of infrastructure, private investment and gross value added gross value add in the context of the research, referred to remuneration employees received, profits being generated and net indirect taxes. The inclusion of the private investment variable measured the transmission effect of direct or indirect impact via private investment (Kularatne, 2006). Kularatne (2006) concluded that social infrastructure drives economic infrastructure, private investment and gross value add directly, and that gross value add is positively correlated to social infrastructure spending with an elasticity of 0.06. The study also concluded that a positive relationship exists between infrastructure development and both social and economic infrastructure investment.

Mabugu, Chitiga and Rakabe (2009) analysed the impact of increasing public infrastructure investment in South Africa, using a computable general least squares approach, and concluded that an increase in public infrastructure investment, above that budgeted for, increases GDP. This was confirmed by Ngandu, Garcia and Arnodt (2010), who analysed the economic impact of planned infrastructural investment programmes on the South African economy, using a multiplier analysis, multiplier decompositions, and structural path analysis.

The analysis concluded that planned infrastructure programmes stimulate production activities and households at all income levels (Ngandu et al., 2010). A recent research study (Mbanda & Chitiga, 2013) used a dynamic CGE analysis to investigate (1) the impacts of increasing public economic infrastructure investment on economic growth and employment in South Africa, (2) the financing infrastructure investment through a government deficit, direct tax on firms and (3) a combination of both. The study concluded that increasing public infrastructure investment has an overall positive impact on the economy. It was determined that increasing public infrastructure investment also increases GDP and employment in South Africa regardless of which method is used to fund infrastructure investment. The study further found that private investment suffers crowding-out effects (Mbanda & Chitiga, 2013).

Despite the lack of sustained South African empirical research, the available research presents strong supporting evidence that infrastructure investment positively drives economic growth. Empirical evidence clearly points to the existence of a positive relationship between infrastructure investment and economic growth. The theory largely supports the view that

building sustainable infrastructure would offer great potential to improve the overall quality of life for the people of South Africa. In addition, with the right policies and incentives, private sector investors could make a profit financing these much-needed infrastructure initiatives, thereby to a large extent ensuring the realisation of the national development objectives.

While the infrastructure–economic growth relationship is positive, it does not mean that positive economic growth will come about without challenges. There are many challenges that need to be taken into consideration, such as the design of the infrastructure initiative, its construction, the financing of these projects as well as its ultimate successful operation. While there are no simple solutions, it remains an empirical fact that the development of new infrastructure initiatives will positively change the South African economic landscape irrevocably.

4. Pension fund investing in infrastructure

Infrastructure as an asset class speaks to an essential network of services needed to drive an economy. The general characteristics of infrastructure assets hold certain benefits for institutional investors. Infrastructure assets are capable of generating long-term, stable and predictable cash flows with an inflation-protection overlay (Latham, 2008). Beeferman (2008) however argued that while infrastructure investing appears to be attractive as a means for diversifying pension fund portfolios, the diverse ways infrastructure is defined ultimately profile the rewards and risks derived from the underlying individual infrastructure projects. Indest (2009) stated that while the long-term growth and low correlation aspects of infrastructure assets are attractive to pension funds, this new type of investment vehicles brings new risks to pension funds, such as exposure to leverage, legal and ownership issues, environmental risks, as well as other regulatory and political challenges. Della Croce (2011) argued that infrastructure investments are attractive to institutional investors such as pension funds because such investments assist with liability-driven investment matching, as well as provide duration hedging.

The inherent characteristics associated with infrastructure developments hold a certain appeal for pension funds. Infrastructure projects are generally large-scale projects with long lead times, and require a significant amount of funding. The lack of generally available large-scale funding ensures that infrastructure projects typically lack competition, making them ideal candidates for market dominance. While it is reasonably easy to start a new manufacturing or services business, the cost and time associated with constructing an electricity-generating facility becomes a natural barrier to entry. Furthermore, infrastructure projects such as

electricity generation, water or gas supply are typically bound by regional boundaries, the availability of the natural resource or prior investment in the supply pipeline to ensure the final product reaches the end consumer.

While investing in infrastructure projects can generate significant benefits for a pension fund, such investments do not come without inherent risks. The point at which a potential investor makes their investment into an infrastructure project, forms the foundation of its achievable, risk-adjusted returns profile. During the construction and development stages of an infrastructure project, the asset does not typically generate any income. The construction-and-development period represents the highest level of risk to a potential investor. Such risks, generally referred to as construction risk, range from cost over-runs to construction delays. The completion of the project does not automatically reduce the investment risk. The completed project faces market risk, which includes a lack of demand for the final product or a change in the political environment, which could render the demand for the asset obsolete. There is also the risk that the completed asset is not built according to specifications. It should however be noted that as the business matures, the accompanying investment risk reduces. As the asset reaches the maturity stage the inherent business risk reduces, as the asset typically is capable of delivering steady and predictable income streams.

Internationally, governments are encouraging private sector investors to play a more active role in bridging the infrastructure gap. With an estimated annual global infrastructure need of about US$ 3.7 trillion as determined by the World Bank at the end of 2015, institutional investors could be a key source of capital to finance long-term productive activities that support sustainable growth (Maier, 2015). One of the benefits is that the private sector not only brings with it additional capital, but it also brings the required technological and operational skills (Della Croce, 2011).

Poole (2008) argued that Australian pension funds are global pioneers with regard to infrastructure investing. Australia's infrastructure investment market had its beginning with the privatisation of assets in energy, transportation and communication during the early 1990s. One of the major drivers of infrastructure growth in Australia was the role that government played in driving the sector. During 2008, the Building Australia Fund was established to finance investment in transport, communication, water and energy infrastructure. The government also established the Infrastructure Australia entity which had as its main objective the development of a strategic blueprint for unlocking infrastructure bottlenecks and the modernisation of the country's economic infrastructure (Inderst & Della Croce, 2013). According to Inderst and

Della Croce (2013), Australian life insurance companies and superannuation funds generally invest in infrastructure in a number of ways, which include debt instruments, listed equity and unlisted managed funds. Australian pension funds have also been investing in infrastructure projects through direct investments in conjunction with other investors. Beeferman (2008) and Indest (2009) concurred that Australian pension funds invest in infrastructure projects through a number of vehicles, including debt instruments, listed funds and unlisted managed funds. It's been observed that these investors had started migrating towards direct investing, including owning and operating infrastructure assets. It is however noted that direct investing, in particular, is more onerous and riskier than providing debt funding or purchasing units in an infrastructure fund.

Canadian pension funds, like their Australian counterparts, have a long history of investing in infrastructure when compared to their international pension funds peers. Canada's infrastructure growth can be attributed to the involvement of public sector money. The pure privatisation of public assets is not politically very popular in Canada. To address this hurdle, PPP Canada was launched in 2008. This project brought together different sectors of government and the private sector to support the adoption of public-private partnerships in infrastructure procurement. This project provided up to 25 percent of the total direct cost of a project (Inderst & Della Croce, 2013). Canada's two largest pension funds invested in infrastructure are the Ontario Municipal Employees Retirement System (OMERS) and the Canada Pension Plan Investment Board (CPPIB). These two funds' approach to infrastructure investing was mainly through indirect investments in infrastructure bonds. Inderst & Della Croce (2013) found that CPPIB had invested around US$10 billion into infrastructure projects by the end of 2010, and held direct infrastructure investments of around US$7 billion by the end of 2011. One of the essential factors driving both Australia's and Canada's infrastructure growth is the stability of their governments' infrastructure legislation, and tax and other investment policies, including stability of the economic and regulatory environments (Inderst & Della Croce, 2013).

Pension regulation reforms in certain Latin American countries provided the stimulus that encouraged pension fund investing in infrastructure-related investments vehicles. This change in policy allowed these funds to gain exposure to infrastructure-related bonds and equities. Pension funds in regions such as Chile, Argentina, Columbia and Peru were allowed to invest in higher-risk investments, including greenfields projects (Cheikhrouhou, 2007). The authors stated that for the period from 1996 to 2003, an average of US$1 billion Chilean infrastructure

bonds were issued annually. This issuance accounted for over 50 percent of total corporate bonds issued during that period. As a result of the Chilean pension fund reforms, local pension funds became the main purchaser of Chilean domestic currency financial instruments issued by concessionaires (Gomez-Lobo et al., 2000).

Stewart et al (2009) argued that infrastructure is one of the most promising areas for pension funds in Africa to invest in (Stewart et al., 2009). The authors estimated that countries such as Kenya held pension fund assets in the region of US$4 billion and Tanzania with estimated pension fund asset pool of around US$1 billion. These pension funds were largely invested in government securities or real estate. The African insurance industry, the main driver for pension fund growth, was still very under-developed when compared to international norms, and there was very little infrastructure-related investment by African pension funds (Steward et al., 2009). The positive aspect is that the pension fund industry in Africa is growing, which creates the opportunity for the funding of infrastructure-related investments.

The 2015 Africa Construction Trends report (Deloitte, 2015) stated that the Southern African region represented 36 percent of all projects in Africa and 37 percent in dollar value. Energy and power accounted for 34 percent of the projects, transport 27 percent and mining 12 percent, while a third of all these projects were in South Africa, followed by Mozambique at 18 percent and Angola at 17 percent (Deloitte, 2015). These projects were generally funded by international DFIs – 34 percent; governments – 18 percent; private domestic funding – 11 percent; and African DFIs – 9 percent. Most of the DFI funding was being allocated to bolster renewable energy generation infrastructure. In South Africa alone, infrastructure investment in renewable energy accounted for close to R1 trillion over the three-year period to 2014 (Deloitte, 2015). The ownership of these projects reflects a similar trend to the sources of funding, with governments funding close to 57 percent of these projects, private domestic investors accounting for around 23 percent and the balance funded by DFIs.

There is a growing voice supporting the view that private sector investors should consider infrastructure as an investment class. The underlying support for this call is the benefits gained from infrastructure assets, including diversification benefits, together with its stable cash flows. The key driver for the investment outcome for a pension fund is the investment approach adopted by the fund. The investment approach of the fund ultimately determines the fund's investment returns and acceptable level of risk. One of the fiduciary duties of a pension fund trustee is to ensure that the assets of the fund are managed prudently (FSB, 2015). The Financial Services Board prudential guidelines state that trustees should be aware of the risks of all

investments together with ensuring that the fund does not invest too large a portion of its assets in one particular asset class (FSB, 2015) The liability of a pension fund represents the future benefit payments the fund needs to make at a future point in time. Pension funds are structured to ensure that they are able to meet these future liabilities. The long-term investment profile of infrastructure assets could assist a pension fund in meeting these future liabilities (Della Croce, 2012).

The main objective of a pension fund is to ensure that its members have access to a pool of funds when they reach retirement age. Pension fund investing in South Africa is governed by Regulation 28 of the Pension Fund Act of 1956. In accordance with South African regulation, a pension fund may only invest in an asset class to the extent that the fair value of the investment in that particular asset class does not exceed a specified threshold (Pension Funds Act, 1956). Infrastructure investment is not defined as a separate asset class, but is included under the 'other investments' category. The investment limits, as per regulation 28, are summarised in Table 5.1.

Table 5.1: Investment patterns and asset class limits

Category	**Investment limit %**
Cash	100
Debt instruments	100
Equities	75
Immovable property	25
Commodities	10
Investment in participating employers	5
Housing loans granted to members	95
Hedge funds, private equity funds and other investments	15

Source: FSB, 2015.

The overall oversight of the management of a pension fund resides with a board of trustees. The trustee board is normally made up of different stakeholders, including employee-selected members, employer-selected members and independent advisors. The main objective of the board is to protect the interest of the members of the fund. The behaviour of the trustee board is governed by the Pension Fund Act of 1956. The general principle of the pension fund act requires that the trustee board consist of at least 50 percent employee representatives. The employee representatives generally emanate from the labour movement associated with the

industry the employees are aligned too. The overall intended benefit of having labour representation on the trustee board is to allow for union involvement in the overall management of the fund.

Further investment oversight of a pension fund is attained through the FSB, whose main objective is to ensure good governance in the management of pension funds in South Africa. The FSB periodically provides guiding notes with regard to the code of conduct of trustees and the respective investment service providers. These notes include prudent investment approaches, as well as overall fund performance appraisal methods. In conjunction with the Pension Funds Act, the role of the FSB is to ensure trustees act with integrity and the utmost good faith towards the fund, and in the best interest of its members.

The 2007 financial crisis and the subsequent investment volatility sent shockwaves through the investment industry. The increased volatility resulted in many investment managers seeking alternative ways of reducing portfolio volatility. Characteristics such as its high entry barriers together with stable cash flows make infrastructure assets the ideal investment class to support the defensive qualities of an investment portfolio. The risk-return profile, together with the lower earnings volatility of infrastructure investing supports a case for portfolio diversification

While the inherent characteristics of infrastructure assets present significant benefits to a balanced pension fund portfolio, the caveat to enjoying these benefits is ensuring the associated investment risks can be managed. It remains the trustees' responsibility to ensure the benefits to be derived from investing in infrastructure can be obtained in an environment that ensures the appropriate level of risk mitigating processes are in place.

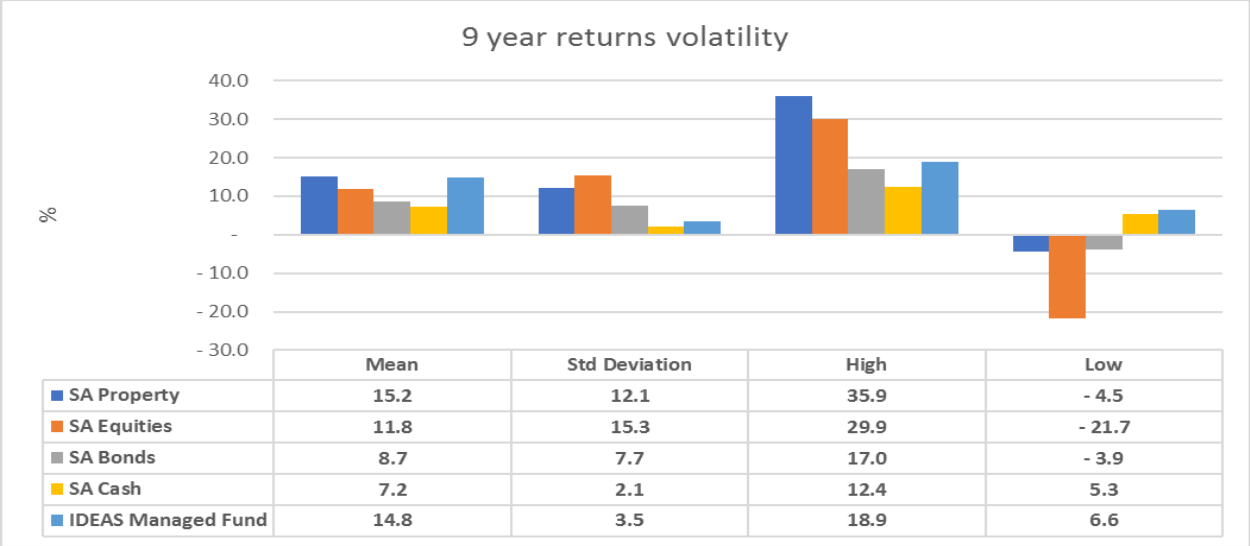
5. Results and empirical analysis

Historically, South Africa's infrastructure needs have been funded through public sector funding. The required funding was raised either through tax revenues, public borrowing from multilateral institutions, national or international capital markets, or through grants from foreign governments and institutions. Mezui and Hundal (2013) concluded that the most effective approach to addressing Africa's growing infrastructure funding shortfall is through the creation of a series of initiatives, which would allow a broader spectrum of players to participate in addressing the infrastructure needs. One of the ways the authors propose, is through creating greater collaboration between the public sector and private institutions. The

need to add to and improve existing infrastructure requires alternative sources of funding. One such source of funding could be pension funds.

Empirical research studies support the view that infrastructure investment can lead to a reduction in the volatility of a balanced portfolio (Latham, 2008; Della Croce, 2012). To explore this theory, a case study was designed, which assessed the volatility of each of the four major asset classes available for investment over a nine-year period. The volatility of the four major asset classes was determined by their respective annual performance standard deviation over this nine-year period, ending December 2016. The four asset classes used in the case study were: the FTSE/JSE SWIX All Share Index, as a representation for South African-listed equity; the All Bond Index, as a representation for South African listed bonds; the FTSE/JSE SA Listed Property Index, as representation for the South African listed property sector; and the Alexander Forbes Money Market Index, as a representation of the South African money market sector. Infrastructure investment returns are generally not publicly available, as the data is either proprietary data or there is a general reluctance to report unlisted infrastructure investment returns. The Infrastructural, Developmental and Environmental Assets (IDEAS) Managed Fund was selected as a proxy for infrastructure investing in South Africa, as it had the most publicly available investment returns. Founded in 1999, IDEAS managed fund is South Africa's oldest and largest domestic infrastructure equity fund, which holds the greatest mix of infrastructure assets (Company website, 2017). The IDEAS managed fund invests in economic infrastructure (roads and railways) and social infrastructure (housing and public private partnerships), as well as renewable energy infrastructure (solar, wind and hydro-generation projects).

The volatility in annual performance of these four asset classes were compared to the volatility in investment returns of the IDEAS infrastructure managed fund. The present case study, as seen in Figure 6 below, revealed that the IDEAS fund had the second lowest returns volatility of the five investment classes, surpassed only by SA cash. While no statistical inferences is being drawn from these findings, as this is outside the scope of this research project, the results do allow for the possibility of further research if a larger volume of data could be obtained.



	Mean	Std Deviation	High	Low
SA Property	15.2	12.1	35.9	- 4.5
SA Equities	11.8	15.3	29.9	- 21.7
SA Bonds	8.7	7.7	17.0	- 3.9
SA Cash	7.2	2.1	12.4	5.3
IDEAS Managed Fund	14.8	3.5	18.9	6.6

Figure 6: Returns volatility comparison

Source: Alexander Forbes Annual Surveys (2010 – 2016); Inet; own calculations.

The study further included interviews conducted amongst a group of fourteen South African investment stakeholders. Participants were selected for their specific knowledge and skills set within the infrastructure investment arena and because the researcher believed they would add value to the research. The representation of respondents is summarised in Figure 7. It was not the intention, nor was it within the scope of the research, to obtain a statistically representative sample of the investment stakeholder community. The information collected was based on the respective individuals' subjective views towards infrastructure investing in South Africa. The responses provided during the interviews were those of the individuals and do not represent the views of the organisations the respondents are associated with or work for.

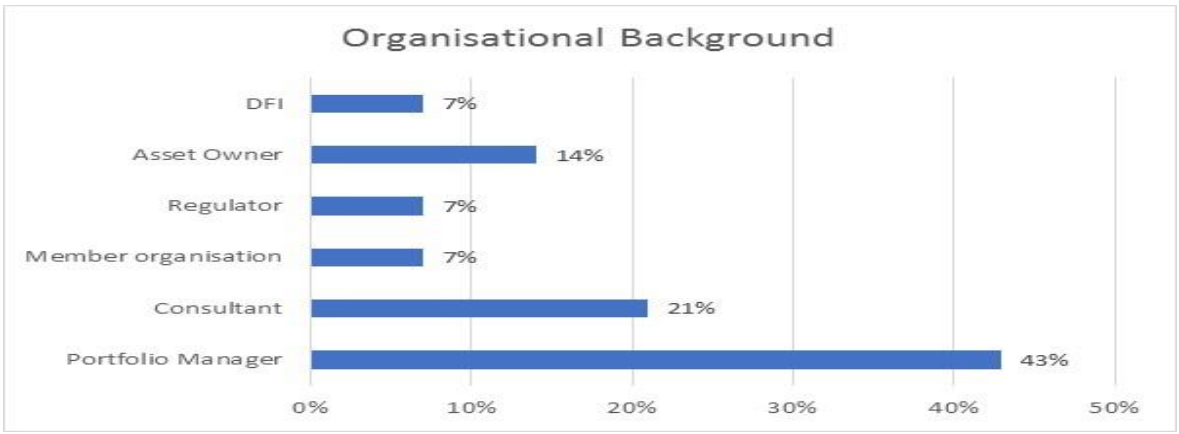


Figure 7: Organisational background

Source: Own calculations

The view expressed by 86 percent of respondents was that the South African infrastructure investment sector is only in its beginning stage compared to international standards, as illustrated in Figure 8. One of the reasons provided for the lack of growth within the sector is the confusion between what constitutes infrastructure investing and what is meant by environmental, social and governance (ESG). Respondents stated that pension fund trustees generally believe that infrastructure investing is ESG. The research established that a lack of a clearly defined infrastructure investment policy within pension fund investment policy statements was driving this confusion. Respondents were of the opinion that most pension fund trustees believe that infrastructure investing is included in their ESG investment policy. The research found that the lack of experience amongst most pension fund trustees to evaluate infrastructure projects effectively further resulted in the sector not growing faster (PWC, 2014). While the bigger pension funds have the required teams in place to do the necessary infrastructure project review, the medium and smaller pension funds have to rely on third party advisors to provide the necessary investment guidance.

Internationally, there has been significant growth in global pension fund investment in infrastructure (Fedderke, et al. 2008; Della Croce, 2011; Inderst, 2013). Respondents stated that this should not be any different in the South African infrastructure investment space. Respondents supported the view that infrastructure assets as part of a balanced portfolio improve the fund's diversification risk, meet pension fund liability matching requirements and provide a stable cash flow (Inderst, 2014). It is these factors respondents believed should be driving more pension fund participation in infrastructure projects.

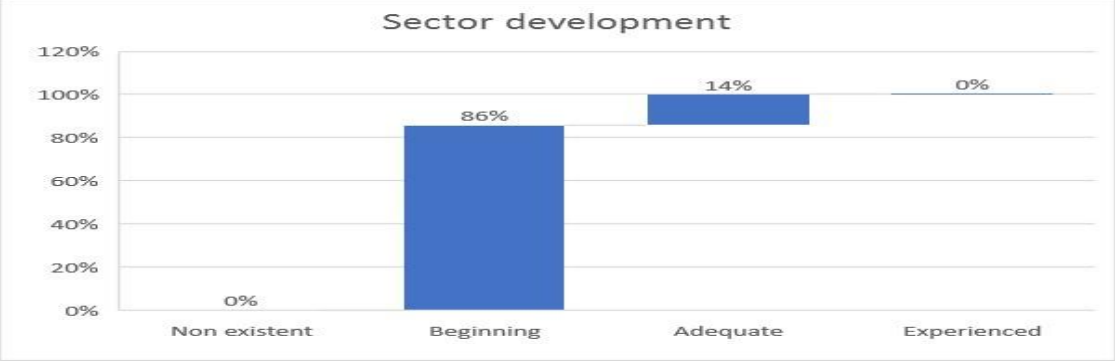


Figure 8: Infrastructure sector

Source: Own calculations

Infrastructure investing can be done either through listed investment instruments or through unlisted investment instruments. All else being equal, infrastructure asset ownership (listed or

unlisted) does not change underlying cash flows or characteristics of the investment (Davis, 2005). Figure 9 shows that 65 percent of respondents preferred an unlisted investment approach. Respondents preferred an unlisted investment approach as it provides the opportunity to exercise management control over the asset as well as allows for a greater range of investment opportunities. Experience amongst respondents was that unlisted investment transactions are generally designed to suit the investment objectives of the investor. Respondents believed that while listed infrastructure investing would improve investment liquidity, listed infrastructure instruments have similar investment characteristics to other listed assets, such as listed equities or listed bonds.

The argument in favour of listed investing (supported by 21% of respondents) is that it brings about investment liquidity to the sector. Listed instruments would create a secondary investment market, which would allow smaller pension funds to gain investment exposure to infrastructure projects. Empirical research found that listed investment instruments tend to display similar characteristics to other listed investment assets, whilst unlisted infrastructure investment instruments' behaviour is driven by the underlying asset (Latham, 2008). A listed-investment approach is seen as having significantly lower investment risk compared to an unlisted-investment approach.

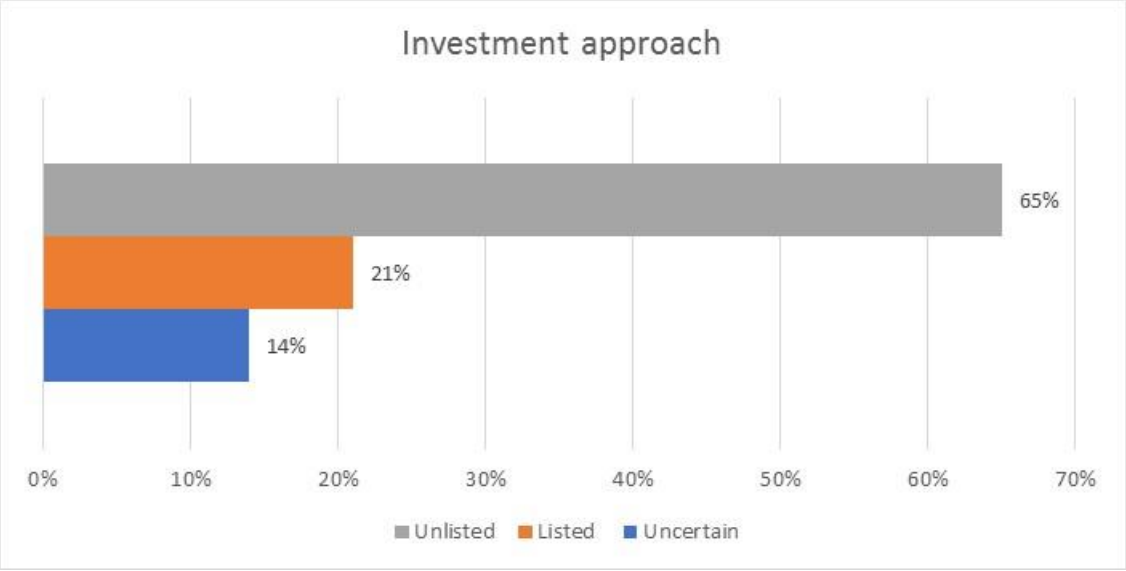


Figure 9: Preferred investment approach

Source: Own calculations

Figure 10 identified that respondents were equally divided with regard to infrastructure investment as a separate asset class. Consultant and asset manager representatives were of the opinion that infrastructure investments should be grouped into a separate asset class. They believed that as a separate asset class, more attention would be given to infrastructure investing, especially from pension fund trustees. The group conceded that infrastructure assets as a separate asset class mainly holds true for unlisted infrastructure assets. Listed infrastructure assets present a problem to asset allocation, as listed infrastructure instruments, such as bonds and equity, may display the same investment characteristics as other listed equities and bonds.

Asset owners and the regulator representative identified asset class investment behaviour as a limiting factor in making infrastructure a separate asset class. Further arguments made, was that for an asset class to be defined as a separate asset class, that group of assets needs to represent certain distinct characteristics and show investment behaviour very different to other asset classes (Greer, 1997). Therefore, while unlisted infrastructure assets may show distinctive investment qualities when compared to other asset classes, this view falls short when the discussion includes listed infrastructure assets.

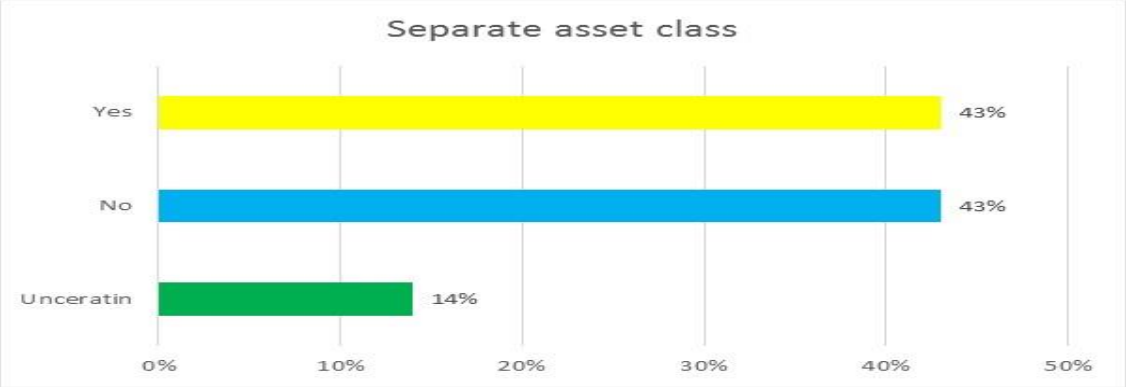


Figure 10: Infrastructure as a separate asset class

Source: Own calculations

The present study found that 65 percent of respondents believed that legislation does not currently encourage infrastructure investment growth, as illustrated in Figure 11. Respondents stated that updates to Regulation 28 during 2013 greatly improved the legislation, as it provided clarity relating to the inclusion of infrastructure assets in the pension fund portfolios. Respondents felt disappointed that the updated legislation did not include infrastructure assets as a separate asset class.

None of the participants expressly stated that they would like to see an increase in pension fund exposure to infrastructure beyond the general rule of 5 percent of the fund. This 5 percent general rule emanated from previous pension fund legislation, specifically pension fund notice PF130, which has subsequently been repealed (National Treasury, 2014). PF 130 stated that pension funds should not invest more than 5 percent of their assets in socially responsible investments. Pension funds in countries such as Australia and Canada have infrastructure holdings close to 15 percent (Della Croce, 2012). Respondents believed that a 5 percent investment exposure is adequate for the pension funds.

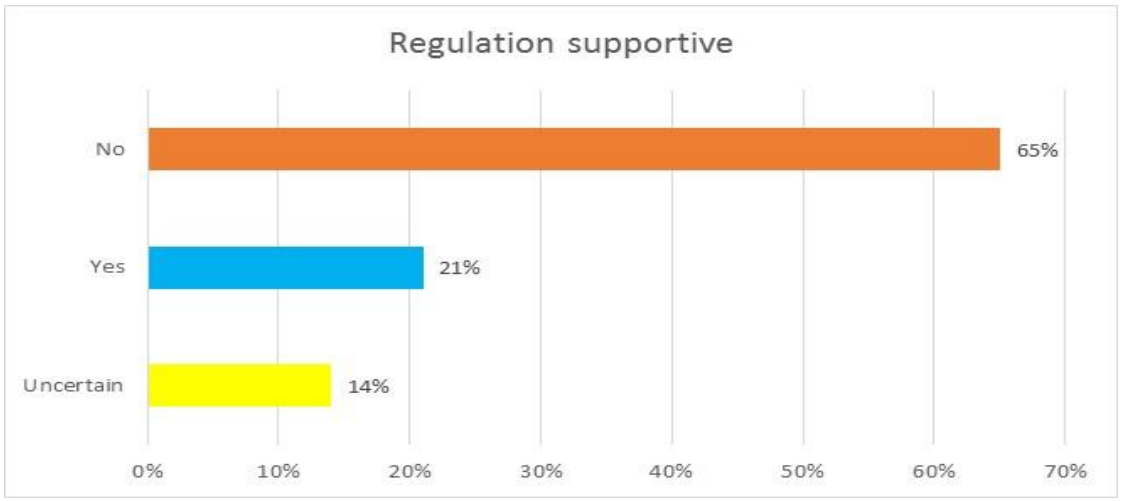


Figure 11: Regulation supportive of infrastructure investing

Source: Own calculations

Respondents agreed that there is definitely a shared responsibility in delivering on government's social and economic agenda, and 72 percent of respondents were supportive of the intentions of the NDP and would positively consider participating in the NIDP, as seen in Figure 12. Respondents were all in agreement that there has to be a shared responsibility in delivering on social and economic needs.

The NIDP includes both economic and social infrastructure projects. All respondents stated that they would consider investing in both economic infrastructure and social infrastructure. Support for both economic and social investing, however, had to be done under the right investment conditions. Respondents stated that participation in the national infrastructure development plan needed to be preceded by a new approach to collaborative efforts between government and the private sector. Respondents were unanimous that the NIDP presents an ideal investment opportunity for private sector participation in the delivery of the NDP objectives.

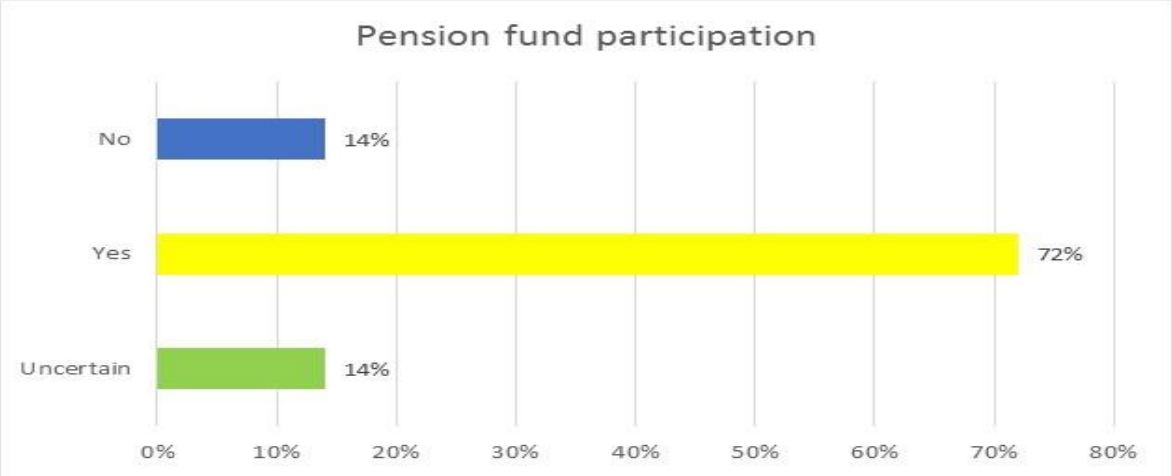


Figure 12: Pension fund participation in NIDP

Source: Own calculations

Research has shown that there is a link between infrastructure investing and economic growth (Coetzee & Le Roux, 1998; Perkins et al., 2005; Fedderke, 2008). Figure 13 shows that 65 percent of respondents were in agreement that infrastructure investing does lead to economic growth, while 21 percent disagreed. The respondents who disagreed believe that economic growth cannot be obtained through infrastructure investment alone. Unless other factors such as inequality, unemployment, education and access to basic services are addressed, the economic benefits that could be derived from infrastructure investing may not necessarily materialise.

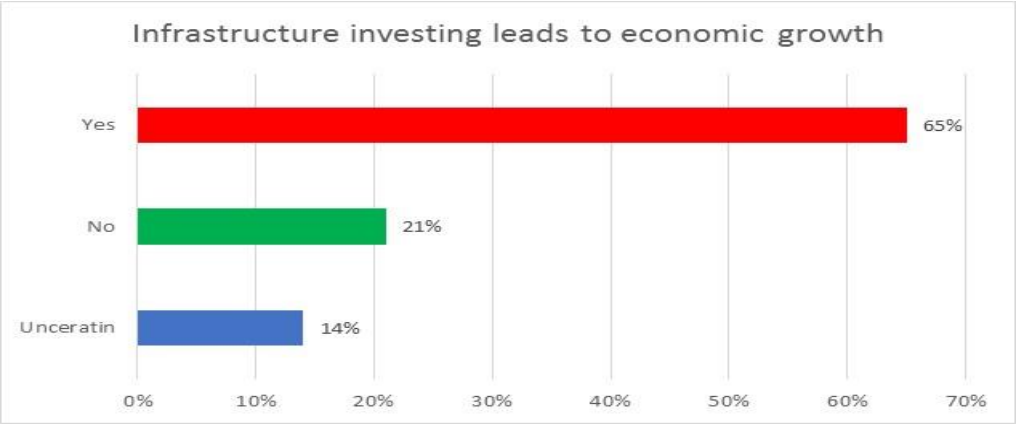


Figure 13: Infrastructure leads to economic growth

Source: Own calculations

Respondents agreed that the NDP is a plan that both government and the private sector can rally around to drive social and economic change. This collaborative effort can become a new approach to driving social and economic change. Respondents see a stable political environment as an investment imperative. While investors can reduce or mitigate project risk, they have limited control over external risk factors. The recent investment downgrading of South Africa's sovereign debt by rating agencies has resulted in an increase in the cost of debt to the private sector. Foreign investors, who are seen as significant strategic investment partners, are avoiding South Africa, as they cannot invest in projects below a certain investment grade.

6. Policy Recommendations

Investing is inherently a risky process. Investment objectives, together with how the fund's assets are allocated and managed, are ways to minimize investment risk. Infrastructure investing by South African pension funds is a relatively new investment approach when measured by global standards. Research has shown that infrastructure investing has a unique set of risks, not normally found in other asset classes. Listed infrastructure instruments, by contrast, have the same investment characteristics as other listed asset classes. Investment risk is especially prevalent when investing in unlisted infrastructure projects. The risks generally associated with unlisted infrastructure investing include contractual risks, construction risks, market risks and product risks. The management of these risks comes at a cost to the investor. Depending on the size of the fund, the cost of managing these risks can be substantial. The cost of managing these risks can adversely affect the investment returns of the investment. Furthermore, unlisted infrastructure instruments tend to be illiquid instruments. These investments generally require investors to remain invested for a substantial period.

Investing in infrastructure projects requires long-term investment commitment. An uncertain economic environment is negative for long-term investment. Respondents to the study required from government to institute transparent economic policies with clearly defined long-term goals. The current perception of instituting investment policies designed to suit certain investors is seen as overall negative for economic growth. The risk associated with investing in the NIDP's designated infrastructure initiatives needs to be shared more broadly. Government or DFIs need to either provide investment guarantees to these projects or invest significantly in these projects. Government needs to clearly specify the extent to which it will

carry investment risk. These clearly defined investment risk levels would allow pension funds to determine the extent to which they are willing to accept investment risk associated with the respective projects.

Investment legislation needs to be reviewed to allow pension funds to invest in lower-rated investment instruments. Legislation needs to be reviewed regarding the manner and the frequency of valuing investments. Legislation pertaining to the inclusion of infrastructure-specific investment into pension fund portfolios needs to be reviewed, or exceptions should be made if pension funds are expected to participate in the NIDP. Pension funds in South Africa are not all the same size; it is, therefore, important that alternative ways be found that would allow participation by all pension funds, irrespective of size.

Infrastructure projects all have different investment profiles, which deliver different investment returns. A new benchmark should be designed, which will calculate investment returns for the different investment projects. Through a process of consultation, clearly defined benchmarks and expected returns need be agreed upon for both economic infrastructure and social infrastructure projects.

The successful implementation of government-led infrastructure projects requires a high-level political will. High-level support for such projects would provide comfort to potential investors and reduce investment risk. It is in the interest of all parties that project risks be identified and addressed at the planning stage of each project. All the required contractual agreements need to be in place prior to commencement of the project. Critical success factors will include how risks are to be shared, who the developers will be and previous experience of developers. Further risks to be identified would include whether the construction contract is a fixed-price contract or not and methods identified to determine how the operators will be remunerated. Respondents believe project risks are controllable and can be reduced or mitigated at the planning stage of the project. Unless these risks are identified and risk-mitigating processes are identified, project costs could end up making or breaking a potentially good project.

Investors have less control over the behaviour of external risk factors. Mitigating processes can include the securitisation of debt instruments. Securitisation allows for the transfer of risk, normally interest rate risk, from one entity to another. Through securitisation, government or a development finance institution can guarantee the debt and allow pension funds to subscribe to the debt instruments. Financial involvement by government in these projects can further reduce investment risk to investors. Private sector investment risk can be reduced by ensuring that

government or the DFI is responsible for an initial percentage of investment risk. Only once a certain investment percentage threshold has been reached, would private investors incur investment risk. External risk can be reduced through the use of a wider spread of investors, each with their own level of risk appetite. Pension funds can therefore invest based on the level of risk the fund is willing to accept.

Pension funds can invest in infrastructure assets indirectly through listed investment vehicles such as publicly traded instruments and investment funds, or acquire shares in listed companies that focus on infrastructure investing. Alternatively, pension funds can invest directly in infrastructure projects. The indirect investment approach is similar to investing in other asset classes; an approach which most trustees are familiar with. The investment model proposed uses a direct investment approach, which is less familiar amongst small and medium-sized pension funds, and the preferred investment approach amongst practitioners. The proposed pension fund participation investment model is set out in Figure 14.

The model differentiates between project, or internal risk and external risk. Project-related risk includes: constriction risk – examples include construction delays, cost over-runs, unforeseen expenses, contractor lacking the required skills; operational risk – examples include labour unrest, accidents, vandalism, operator not having the required skills; and commercial risk – examples include wrong cost estimates, decline in demand for the product, increased competition. External risk identified includes: political risk – examples include changes to policy relating to the project, government intervention, regulatory changes; and financial risk – examples include significant fluctuations in exchange rates, fluctuations in interest rates, incorrect inflation assumptions.

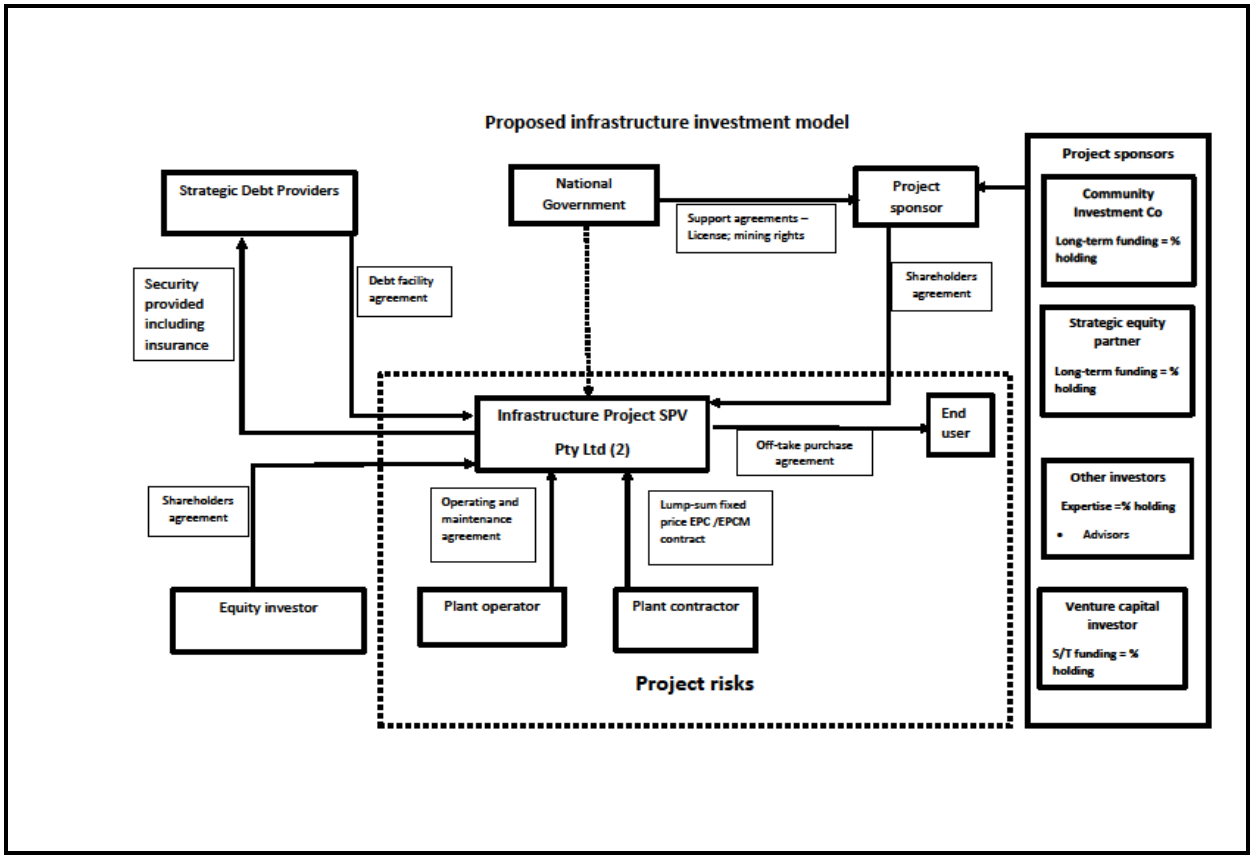


Figure 14: Proposed infrastructure investment project model

Source: Own calculations

Practitioners are in agreement that the NIDP can serve to assist in addressing the social and economic needs of South Africa. The South African economy is in dire need for some new stimuli. Research supports the view that the NDP's infrastructure development plan provides the required investment opportunity needed to grow investing in infrastructure in South Africa. Private sector participation in the NIDP can be that stimulus that the economy requires. The infrastructure plan provides the ideal investment opportunity for greater private sector involvement in developing the country's infrastructure assets while making a social and economic difference.

The growth path the South African government chooses to take, requires corporate South Africa's involvement. Given the imperative of addressing basic needs, the focus of the democratic government in the first twenty years was to roll out social infrastructure. Consequently, the focus for the next ten to twenty years has to be the redress of economic infrastructure backlogs and inadequacies, which have become a strain to economic growth.

7. Conclusion

The research study found that there is a lack of access to good quality independent infrastructure investment data. The lack of access to independent data makes the comparison amongst different projects difficult, limiting empirical studies. The South African infrastructure investment sector has the potential of becoming a significant role player in the rest of the African continent. Pension funds in other African countries are growing with the potential to become an important source of funds for infrastructure practitioners. Withholding infrastructure investment data does not serve the greater good of either the sector or potentially new investors. Access to good quality independent data would certainly encourage more research into the sector, which ultimately would benefit all involved in infrastructure investment space.

REFERENCES

Abedian, I & Van Seventer, D. (1995). *Production and Multiplier analysis of Infrastructure Investment in South Africa.* Pretoria: Ministry of Finance.

Allen, DS and Ndikumana L. (2000). Financial intermediation and economic growth in Southern Africa. *Journal of African Economics, 9*, 132-160.

Andrews, A; Wahba, S. (2007). Investing in Infrastructure: A Pimer. . *Infrastructure Paper Series no. 2. Morgan Stanley*.

Babbie, E. (2013). *The practice of Social Research* (Thirteenth ed.). Wadsworth.

Baxter, P and Jack, S (2008). *Qualitative Case Study Methodology: study Design and Implementation for Novice Research.* The Qualitative Report pg 544-559

Beeferman, L. (2008). *Pension Fund Investment in Infrastructure: a resource paper.*

Behar, A; Manners, P. (2013). *Logistics and exports CSAE working paper.* Oxford University.

Bianchi,R; Bornholt, G; Drew, M; Howard, M. (2014). Long-term U.S Infrastructure returns and Portfolio Selection. *Journal of Banking and Finance, 42*, 314-325.

Bielenberg,A; Kerlin, M; Oppenheim,J & Roberts, M. (2016). *Financing change: How to mobalize private-sector financing for sustainable infrastructure.* McKinsey Centre for Business and Environment.

Cabot-Allerzhauser, A. (2009, November). A Simple Framework for Investment decision-making. *Enterprise Risk*, pp. 20-21.

Chambers, J. (2007). Infrastructure research report. *Pension Consulting Alliance*.

Cheikhrouhou, J (2007). *Structured Finance in Latin America: Channeling Pension Funds to Housing, Infrastructure and Small Businesses*. World Bank

Coetzee, Z & Le Roux, E. (1998). Does Public Infrastructure Affect Economic Growth. *Annual EBM Conference of the National Production Institute.*

Courtois, Y. (2013). Infrastructure: An Emerging Global Asset Class. *CFA Institute Magazine*, 16.

D. Strugell, K. Dreyer, H. Du Toit and N. van der Walt. (2011). *DC through the rearview mirror.* Presented at the Actuarial Society of SA 20111 convention.

Dailami, M & Klein, M. (1998). *Government support to Private Infrastructure Projects in Emerging Markets.*

Davis, E. (2005). *The role of pension funds as institutional investors in emerging markets.*

Della Croce, R. (2011). *Pension Funds Investment in Infrastructure: Policy Actions, OECD working papers on Finance, Insurance and Pensions.* OECD Publishing.

Della Croce, R. (2012). *Trends in Large Pension Funds investment in Infrastructure: OECD working paperon Finance, Insurance and Private Pensions No 29.* OECD Publishing.

Deloitte. (2015). *African Construction Trends 2015.* Cape Town: Deloitte.

Fedderke, J and Bogetic, Z. (2006). *Infrastructure and growth in South Africa: Direct and indirect produ tivity impacts of 19 infrastructure measures.* Economic Research Southern Africa.

Fedderke, J and Garlick , R. (2008). *Infrastructure Development and Economic Growth in South Africa: A Review of the Accumulate Evidence.*

Fedderke, J and Wollnik, A. (2007). *The Spartial Distribution of Manufacturing in South Africa 1970-1996 and its Determinants.* Cape Town: Univ of Cape Town School of Economics.

Financial Services Board. (2002). *Registrar of Pension Funds Annaul Report 2002.* Financial Services Board.

Financial Services Board. (2012). *Registrar of Pension Funds Annual Report 2012.* Financial Services Board.

Financial Services Board. (2015). *Annual Report to March 2015.* Pretoria: Financial Services Board .

Finkenzeller, K; Dechant, T; Schafers, W. (2010). Infrastructure; a new dimension of real estate. *Journal of Property Investment and Finance, 28*(4), 263-274.

Fombad, M. (2014). Enhancing Accountability in Public-Private Partnerships in South Africa. *Southern African Business Review*, 66-92.

Frankel, J; Smit, B; and Sturzenegger , F. (2006). *South Africa: Macroeconomic Challenges Afyer a Decade Success.* Centre for International Development.

FSB. (2015). *2015 Registrar of Pension Funds Annual Report.* Financial Services Board.

GEPF. (2017). *Chairman's report.* GEPF.

Given, L. (2008). *The Sage encyclopedia of Qualitative Reasearch Methods.* CA: Sage Thousand Oaks.

Gomez-Lobo, A and Hinojosa, S. (2000). *Braod roads in thin Country: Infrastructure consessions in Chile.*

Greer, R. (1997). What is an Asset Class Anyway. *Journal of Portfolio Management, 23*(2), 86-91.

Griffiths, S. (2005). Smalltime savers Bigtime capital. *African Investor*(September).

Harris, & Tadimalla, S. (2008). *Financing the boom in PPP's in Indian Infrastructure.*

Inderst, G. (2013). *Private Infrastructure Finance and Investment in Europe.*

Inderst, G. (2014). Pension Fund Investment in Infrastructure: Lessons from Australia and Canada. *Rotman International Journal of Pension management, 7*(1).

Inderst, G; Della Croce, R. (2013). *OECD working papers on Finance, Insurance and Private Pensions.* OECD.

Indest, G. (2009). *Pension Fund Investment in Infrastructure: OECD Working Paper on Insurance and Private Pensions. No 32 .* OECD Publishing.

Investopedia. (2013). *Investopadia*. Retrieved May 20, 2015, from http://www.investopedia.com/articles/stocks/06/peterlynch.asp

Investopedia. (2015). *Investopedia*. Retrieved May 17, 2017, from http://www.investopedia.com/ask/answers/040915/what-demandside-economics.asp

IPPP. (2017). *Quaterly review.* Independent Power Producer Procument Program.

Kaniki, S. (2010). Funded Pensions: An Underdevloped source of domestic financefor African economics. *Africangrowth Agenda, January to March*, 6-9.

Kodongo, O. (2013). Infrastructure finance in SSA: Options and issues. *Africagrowth Agenda*, 12-14.

KPMG. (2016). *The 13th Fice-Year Plan - China's Transformation and Integration with the World Economy.* KPMG.

Kularatne, C. (2006). *Social and Economic Infrastructure Impacts on Economic Growth in South Africa.* Cape Town: UCT School of Economics.

Latham, D. (2008). *Building a case for direct infrastructure.*

Mabugu, B; Chitiga, M and Rakabe, E. (2009). *Public Infrastructure Investment: Financial and Fiscal Technical report.* Midrand: FFC.

Maier, T. (2015). *Towards an effective PPP business model: An eight point plan for closing the infrastructure gap.* World bank.

Marathe, V; Noel,M; Sirtaine, S. (2004). *Making Capital Markets work for infrastructure finance.*

Marshall, M. (1996). Sampling for Qualitataive Research. *Oxford University, 13*(6).

Mbanda, V and Chitiga, M. (2013). *Growth and Employment Impacts on Public Economic Infrastructure Investemnt in SA.* Poverty and Economic Policy Network.

Mezui, C; Hundal,B. (2013). *Structured Finance: Conditions for Infrastructure Project Bonds in African Markets.* Tunis: African Development Bank.

Ministry of Finance (Botswana). (2016). *National development Plan no 11.* Republic of Botswana.

Ministry of Finance (Uganda). (2015). *2nd NDP 2015/16 - 2019/2020.* Republic of Uganda.

Municipal Finanace Management Act (No. 56 of 2003)

National Treasury. (2013). *Technical discussion paper: Charges in South African Retirement Funds.* National Treasury.

National Treasury. (2015). *Public sector infrastructure update.* National Treasury.

National Treasury. (2017). *Budget Review 2017 Public Sector Infrastructure Update.* National Treasury.

NDP Uganda. (2015). *Ungandan 2nd National Developemnbt Plan 2015/16 - 2019/2020.*

Newell, R; Peng, H; DeFrancesco, A. (2011). The performance of Unlisted Infrastructure in Investment Portfolios. *Journal of Property Research, 12*, 59-74.

News24. (2017, September 10). Fight or flight as Eskom 'squashes' renewable IPP programme. Johannesburg.

Ngandu, S; Garcia, A and Arnodt, C. (2010). *The Economic influence of Infrastructural Expenditure in SA: A mulitiplier and Structural path.* Trade and Industry Policy Strategies Conference October 2010.

NPC. (2011). *National Planning Commission - Diagnostic Overview.*

Oberhofer, G. (2001, December). Hedge Funds - a new asset class or just a chnage in perspective. *Newsletter*.

OECD. (2007). *Infrastructure 2030, volume 1 and 2.*

OECD. (2013). *Annual Survey of Large Pension Funds and Large Pension Reserve Funds, Report on Pension Funds' Long-term Investments.* Paris: Organisation for Economic Co-operation and Development.

OECD. (2013). *Long-term investment by pension funds and public pension reserve funds.* France: Organisation for Economic Co-operation and Development.

OECD. (2015). *Fostering Investment in Infrastructure.* OECD.

Peng, H.W and Newell, G. (2007). The significance of infrastructure in Australian portfolios. *Pacific Rim Property Research Journal, 13*(4), 423-450.

Pension Funds Act. (1956). Pension Funds Act No 24 of 1956.

Perkins, P; Fedderke, J and Luiz, J. (2005). An Analysis of Economic Infrastructure Investment in South Africa. *South African Joournal of Economics, 32*(2), 211-228.

PICC. (2012). *Summary of the South African National Infrastructure Plan.* Presidential Infrastructure Coordinating Commission.

Pillay, U; Tomlinson, R; Du Toit, J. (2006). *Democracy and Delivery: Urban Policy.* Cape Town: HSRC.

Piyatrapoomi,N; Kumar,a. (2004). Investment Decision Framework for Infrastructure Asset Management. *Research in Transportation Economics*.

Poole, R. (2008). *Pension Funds and Infrastructure Investment.*

Public Finance Management Act (No.2 of 1999)

PWC. (2014). *Unlocking investment in Infrastructure.* Pricewaterhouse Coopers.

Romer, D. (2004). *Advanced Economics.* New York: McGraw-Hill.

SA National Treasury. (2015). *RETIREMENT REFORM: LOWERING CHARGES AND IMPROVING MARKET.* National Treasury.

Sawant, R. (2010). Infrastructure Investing, Managing Risks and Rewards for Pensions, Insurance Companies and Endowments. *Wiley Finance*.

South African Reserve Bank. (2017) Quaterly Report

Statistics South Africa. (2017) Third Quarter Report

Stanley, M. (2011). Investing in Infrastructure: Getting the conditions right. *OECD Juornal - Financial markettrends, 2011*(1).

Sterwart, F & Yermo, J. (2009). *Pensions in Africa: OECD working paper on Insurance and Private Pensions. No 30.* OECD.

Stevens, B & Schieb, P. (2008). Infrastructure: Mind the gap. *The OECD Observer, 264/265*, 24-26.

Rusconi, R. (2008). *Whose Money is it Anyway*: A Discussion Document. Institutional Investments

UBS. (2012). *An Introduction to Infrastructure as an Asset Class.* UBS.

Van Aardt, I. (2012). A Review of Youth Unemployment in South Africa: 2004-2011. *South African Journal of Labour Relations, 36*(1).

Vives, A. (1999). *Pension Fund in Infrastructure Project Finanace: Regulation and Instrument design.*

Watters, J.K & Biernacki, P. (1989). Targeted sampling: Options for the study of hidden populations. *Society for the Study of Social problems, 36*(4), 414-416.

Weber, B; Alfen, H. (2010). Infrastructure as an asset class: Investment Strategies, Project Finance and PPP. *Wiley Finance*.

Whatis. (2017, August 30). *whatis.techtarget.com/definition/business-case*. Retrieved from whatis.techtarget.com: http://whatis.techtarget.com/definition/business-case

Wikipedia. (2017, August 30). *en.wikipedia.org/wiki/Business_case*. Retrieved from Wikipedia.org: https://en.wikipedia.org/wiki/Business_case

World Bank. (1994). *Infrastructure for Development.* World bank.

World Bank. (2010). *Africa's Infrastructure - A Time for Transformation.* Washington DC: World Bank.

World Bank. (2013). Country Databank. Retrieved May 22, 2015