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Perspectives on financing healthcare in Africa

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Perspectives on financing healthcare in Africa

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Declaration

I, Samukeliso Dube, declare that the research work reported in this dissertation is my own, except where otherwise indicated and acknowledged. It is submitted for the degree of Master of Management in Finance and Investment in the University of the Witwatersrand, Johannesburg. This thesis has not, either in whole or in part, been submitted for a degree or diploma to any other universities.

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Signature of candidate Date

If I were not African, I wonder whether it would be clear to me that Africa is a place where the people do not need limp gifts of fish but sturdy fishing rods and fair access to the pond. I wonder whether I would realize that while African nations have a failure of leadership, they also have dynamic people with agency and voices.

Chimamanda Ngozi Adichie, Novelist

Abstract

Following decades of under-investment, gaps in Africa's healthcare infrastructure are becoming disturbingly obvious. The interplay of governments' fiscal policies of budget imbalance reduction and other political considerations present a seemingly insurmountable obstacle to overcoming the backlog in Africa's healthcare infrastructure. The two main objectives of this study were to understand the sources of financing and the best way to structure the financing of healthcare infrastructure in Africa. Looking at financing arrangements in various industries; and how healthcare sectors in developed countries have been financed, the report draws on perspectives from the financiers on how the healthcare infrastructure gap should be filled in Africa.

This study, which utilised survey questionnaires and in-depth interviews, identified government revenues, regional development banks, private equity and donor financing numbers as dominant funding sources for the financing of healthcare infrastructure in Africa. Further, the study explored various ways in which finance could be structured and found that within those various models of financing, donor financing and government revenue were statistically significant on structuring the finance, especially within public-private partnership arrangements. These include sale and lease back arrangements ($p=0.0022$), complete ownership of projects by the private sector ($p=0.003$), management operation contracts ($p=0.00034$) and other forms of PPPs.

More perspectives were obtained on enablers and barriers to improving investability of the healthcare sector. Africa's economic growth and the improving ease of doing business were major enablers for healthcare sector's investability. However, the role played by government as both a financier and a regulator seemed a barrier. Some structural models that would need government back-up include subordinated debt; with pricing at marginal cost and matching risk and return recovered through the taxation system. The latter continues to characterise much of Africa's publicly provided healthcare infrastructure.

In conclusion, investments in healthcare may not be separated from a country's level of financial deepening. As the sector develops, it then becomes possible to utilise the models aforementioned. It is recommended that any governments' investments in healthcare be more

catalytic, to unlock value that allows the private sector to compete, both as financiers and innovators in healthcare. Furthermore clear strategies on PPPs are urgently needed for healthcare in Africa including policy consistency in financing and regulating healthcare.

ACRONYMS

WHO	World Health Organisation
PPPs	Public Private Partnerships
ICA	Infrastructure Consortium for Africa
OTC	Over the Counter
SPVs	Special Purpose Vehicles
GDP	Gross Domestic Product
ETFs	Exchange Traded Funds
IFC	International Finance Corporation
ECB	External Commercial Borrowing
JSE	Johannesburg Stock Exchange
NHI	National Health Insurance
MNCs	Multi-National Corporations
BRICS	Brazil Russia India China South Africa
PIC	Public Investment Corporation

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1 INTRODUCTION

"*There is a tremendous opportunity to leverage the private sector in ways that improve access and increase the financing and quality of healthcare goods and services throughout Africa*"

Liz Huller, IFC president

This introductory chapter provides the background to the study and the research problem, followed by a discussion of the study's research objectives. Consideration is given to the study's importance and the potential benefits of the study. Finally, a brief overview and orientation of the study chapters are provided as a round-up of this roadmap chapter.

1.1 Background information and the research problem

Healthcare is a critical ingredient for human and economic development; yet financing this social good is a mammoth task for most African governments (Bloom and Fink, 2013). The healthcare infrastructure financing gap commonly reflects in most African countries' healthcare balance sheets (Sambo, Kirigia, and Ki-Zerbo, 2011). Increasingly therefore, many platforms to discuss innovative financing methods for infrastructure between governments and private sector have been developed to deliberate on these issues (Heever, 1997; Sambo *et al.* 2011).

A good starting point is the business case of investing in healthcare as a social good. The genesis of this debate is from early work on decomposition analysis that demonstrated that improvements in health technology, institutions and infrastructure have contributed more to overall health gains than have increases in national incomes (Preston, 1975). As evidence on the importance of investing in healthcare is presented, including the seminal paper by Jeffrey Sachs (2002), more work has shown that investments made in health could even go beyond mere contribution to the GDP, but to the value of life itself (Heever, 1997; Sachs, 2002; Chan, 2013; Horton and Lo, 2013; Lane, 2013). Indeed where investments in healthcare have been catalytic, they also turn the sector into an industry that contributes to economic growth. Today, the healthcare infrastructure agenda competes with many others for support in moving onto and up the political agenda of many countries (Horton and Lo, 2013).

Africa, however, is lagging behind in this aspiration; still carrying 80% of the disease burden and yet only has 10% of the needed infrastructure to tackle the disease challenges (Sambo *et al.*, 2011). The needs for infrastructure financing in general are not negligible, and so is the infrastructure demand for healthcare. A McKinsey social infrastructure report estimates that public entities around the world need more than $8 trillion to fund social infrastructure projects through 2020, with more than 40% of this needs being in developing countries (Ratha *et al.,* 2008). With most of the social infrastructure funding coming from government revenues, this

calls for different financing mechanisms that will shift from the inadequate public sector resources to involve the private sector more.

Scholarly work that matches the demographic and epidemiologic transitions of nations demonstrates that most developing countries are still at the nascent stages of addressing the complex issues associated with improving public healthcare – which most developed nations have already encountered and tackled (Mills and Hsu, 2014). Inadvertently, as Africa truly emerges, with a rising middle class, the demand for better healthcare delivery systems will place further strain on existing health systems.

The important issue that this research seeks to answer is that given this transition, how do we ensure the development of robust healthcare infrastructure in Africa, in view of the large capital requirements needed to set up such facilities. Others could argue that perhaps the question needing answering is what kind of healthcare systems does Africa need if the continent were to borrow lessons of infrastructure financing from other developed countries – some which have gone wrong such as in the United States? However, the former issue also stems from the recent Ebola outbreak that claimed thousands of lives in West Africa, mainly because of poor healthcare infrastructural environments.

Traditionally, healthcare financing has only been a responsibility of national governments. Borrowing from other infrastructure projects and how healthcare has been financed elsewhere, there could be better ways of filling the gap in healthcare by seeking other sources of funding and better structuring of finance for healthcare projects. This study seeks to explore perspectives of financiers on what these funding models could be and their relevance in Africa's healthcare markets, with a bias towards the public sector. By assessing enablers and barriers of investing into healthcare, these perspectives help assess investability of healthcare as a sector.

1.2 Problem analysis and theoretical considerations

Many African countries, governments, economists and private sectors alike are seeking alternative ways of financing healthcare outside the traditional model of financing healthcare from tax revenues. African governments have made commitments to increase their spending on health matters from the Abuja Declaration of 2001(AU 2001, Sambo, *et al.* 2011), the Addis-Ababa Declaration of 2006 on community health in the African region and the 2008

Ouagadougou Declaration on primary healthcare and health systems in Africa, of which most African governments are signatory to (Lu *et al.*, 2010).

Performance evaluations of the aforementioned declarations reveal that most of the commitments have largely been unmet, and the scarcity of funds for health has indeed become a barrier to delivering adequate health services (Sambo *et al.*, 2011, Mills and Hsu, 2014). Data from the WHO illustrates the mismatch between the burden of disease and the spending on health in developing countries versus developed countries (Chan, 2013). In 2010, the average total health expenditure in African countries stood at US$135 per capita, compared to US$3150 spent on healthcare in an average high-income country, and none of the countries surveyed had more than 10% of their GDP expenditure on healthcare (Chan, 2013, Sambo *et al*., 2011).

Whilst it may seem a solution to this conundrum, bringing in financing from the private sector poses important challenges ranging from risk, profitability of business models, and capital provisioning that may need complex financing arrangements due to the enormous amount of money required to set up healthcare infrastructure. For private sector to play this role, it would be useful to understand properly who these investors are and how financial contracts can be tailored to accommodate their healthcare investment aspirations.

As stated in the background subsection, there is evidence that improving spending on health not only improves health outcomes of citizens, but also yields economic gains. In addition, healthcare has also become attractive as an investment destination in Africa, where private players have gained prominence along the value chain of delivering this public good – thus healthcare as a sector can contribute to economic growth (Lane, 2013).

The private sector equally faces the challenge of financing healthcare, where some case examples include Discovery Medical Aid leading discussions on finding innovative ways of delivering efficient and better quality services at lower costs in South Africa; (du Plessis *et al*., 2013, Bateman, 2013). The conundrum that both private and public sector face is finding innovative ways of financing healthcare in its entirety; in respect of both capital requirements and operating costs (Bateman, 2013). As such, interventions on financing healthcare in the public sector would also benefit the private sector. Moreover, the developing countries have an

opportunity to leapfrog the best operating models for healthcare whilst ensuring quality – if innovative financing modalities are pursued.

Conceptually, the health financing challenge is normally and perhaps erroneously divided into two parts, one for infrastructure or fixed assets and the other for operating costs (Sambo *et al*., 2011, McIntyre *et al*., 2014). However, the reality is that for any infrastructure projects, success involves matching the risk-return requirements of different sources of finance with project characteristics, and this is achieved through careful structuring for example of debt and equity, and private players in healthcare require financial contract structuring that favours them.

This subject raises many questions some of which this research seeks to answer:

Are public-private partnerships (PPPs) the answer? Some public-private partnership models have been utilised, and while achieving success especially in infrastructural costs, have been criticised as being unsustainable and inefficient in the health sector, benefiting the private sector more than the public sector (Grimsey and Lewis, 2005; Roehrich, Lewis *et al.,* 2014).

Why are some African governments not keen to utilise models such as leasing agreements for infrastructure, with some having laws against such arrangements? Other models, such as infrastructure bonds and infrastructure funds have not been properly utilised in the health sector but are they relevant at all in this sector? More often, bilateral arrangements with institutions such as the Global Fund have been used as vehicles for financing healthcare but are they effective models for Africa? The role that development banks have played in infrastructure is huge in Africa but what share of that market goes to health? Indeed other models such as borrowing someone else's assets, opening up new revenue streams from one's infrastructure, and availability payments need to be explored for relevance in financing health infrastructure. An even more challenging call is how to efficiently fund the operating costs in healthcare.

Universal coverage for health is a goal that most African governments have subscribed to, and this for many is equivalent to healthcare insurance that works for the bottom of the pyramid (McIntyre *et al*., 2014, Suraratdecha *et al*., 2005). While this welfare approach has worked in some countries, others have criticised the presence of health insurance as a cost driver for healthcare, explaining why medical inflation is higher than nominal inflation in some countries

(Suraratdecha *et al*., 2005, Mills and Hsu, 2014, Mills *et al*., 2011, Lagomarsino *et al*., 2012). Given the inefficient revenue collection mechanisms in most African countries, some authors deem this approach to universal coverage as a potential breeding ground for inefficiency in healthcare (Mills *et al.,* 2011). To what extent is this true? In about half of African countries, 40% or more of the total health expenditure constitutes household out of-pocket payments, which is the most regressive way of funding healthcare and is a major barrier to access.

Using such questions as raised above, this research seeks to determine the relevance of various financing models for healthcare that is relevant in African markets and to understand the perspectives of various decision makers in the value chain of delivering healthcare. At the heart of these debates within the healthcare markets, both for private and public sectors, is the need for creativity and innovation around the subject, and perspectives from the stakeholders that should shed light on what future models for healthcare should encompass.

If better ways of financing healthcare are implemented, this will not only improve healthcare access and quality, but developing countries will have an opportunity to leapfrog the transitional health systems phase to meet current health needs.

1.3 Objectives of the research

Previous studies on financing healthcare have largely dwelt on how to fund healthcare in low income settings. Some have further explored opportunities for public-private partnerships in financing healthcare. This emphasis has left a gap in what the best financing models would be for Africa so as to achieve the aspirational targets of Africa's healthcare infrastructure gap.

An exploration of what the various financing models are in most developing countries in Africa that aspire not only to equitable access to healthcare, but those that can leapfrog quality gaps, is scarce in the literature. There is also no relevant examination of what these models are in healthcare, and a meaningful contextualisation of what this means for African health markets has not been done. Furthermore, perspectives of financiers have been explored largely in connection with entrepreneurship or funding economic infrastructure, but not with regards healthcare infrastructure, which delivers a social good; where discussions have been dominated by governments and multilateral institutions such as the World Health Organisation (WHO).

This research seeks to close this knowledge gap by packaging the various funding models and examining their relevance for healthcare provisioning in African economies.

1.4 Research questions

The goal of this research is to identify various funding models that have been used, or that are relevant for healthcare in developing markets in order to answer the following broad research questions:

1 What is the perceived role of finance in developing healthcare in Africa?
2 What are the various financing models and funding sources for both capitation and operating costs for healthcare delivery in Africa's developing economies?
3 What are the determinants of choice of financing healthcare in developing countries; looking at enablers and barriers to financing healthcare in the region?

1.5 Key contextual definitions

Healthcare (WHO 2013): is the organised provision of medical care to individuals or a community which comprises health information system; leadership and governance; essential medical products and technologies; health financing; and human resources for health and service delivery.

Health financing versus funding: According to Normand and Thomas (2008), financing is defined as a system to raise sufficient funds for health fairly or a system to pool financial resources across population groups to share financial risks or a financing governance system supported by relevant legislation, financial audit and public expenditure reviews, and clear operational rules to ensure efficient use of funds (Normand and Thomas, 2008). As asserted by these authors, "Financing is about managing cash-flow related to infrastructure development. It is concerned with raising the capital required to enable the initial investment in infrastructure".

Healthcare funding: is about who ultimately pays for the infrastructure. It relates to paying for that capital (often over time) as well as the subsequent operating costs required to sustain the infrastructure. This is related to financing and the two exist in a continuum. According to Normand and Thomas (2008), debt and equity can only be a source of finance, not a source of funds, as they need to be paid back. Grants from the fiscus and transfers from international donors are both a source of funds as well as a source of finance.

Infrastructure: is usually divided into economic and social sectors (Macquarie, 2009). Using a broad definition, **economic infrastructure** typically includes transport (e.g. ports, airports, roads, bridges, tunnels, parking); utilities (e.g. energy distribution networks, storage, power generation, water, sewage, waste); communication (e.g. fixed/mobile networks, towers, satellites); and renewable energy (e.g. solar and wind generation). **Social infrastructure** - also called public real-estate, includes: schools; hospitals and defence buildings, prisons and stadiums.

Healthcare infrastructure: (Inderst, 2010): Includes buildings such as hospitals and clinics; and long term medical equipment. These are the focus of this study.

1.6 Importance and benefits of the study

Through the analysis of the relevance of various funding models for the African healthcare markets, the study will provide stakeholders with insight as to what other financing models exist. The study is a step towards **developing optimal models for healthcare financing**, both for capital investments and operational costs. The results of the study will also help policy makers and researchers alike to widen the scope of funding from the government public sector to other potential financiers, fully understanding what the opportunities and limitations of these models are.

1.7 A synopsis of the research method

The research will be conducted using qualitative and quantitative approaches that utilise primary data. Essentially a sample of finance practitioners particularly involved in financing of healthcare, both from private (private equity firms, banks, venture capitalists, medical insurance schemes and healthcare innovators) and public (government officials within treasury and within the ministries of health) are included in a survey sample. Some of the respondents are followed up for further qualitative inquiry based on the survey responses. The survey is delivered online and sets of statistical analyses of the survey responses are carried out to derive significant research findings. Additional detail on the research method is given in Section 3.1.

1.8 Brief orientation and chapter overviews

Chapter 1 has provided background information to the research problem, setting the context within which this study was conceived and the benefits thereof. The chapter concludes

with a set of objectives for the research and a synopsis of the research method deployed in the study.

Chapter 2 presents a literature review which contextualises the financing of the healthcare landscape in Africa. The literature review begins with the state of healthcare in Africa, making the case for innovative ways of filling its healthcare infrastructure funding gap. The thrust of the literature review is thematic, dwelling on what role finance plays in healthcare, what the financing models are, what merits they have in funding infrastructure, and an outlook on the investability of healthcare infrastructure as an asset class where the review dwells on the enablers and barriers to investing in the sector. The literature review generates questions that need to be answered by financiers or stakeholders highlighted above. The literature review also explores the potential conflict between capital cost determinants and operating cost determinants.

The research design and methodology are presented in **Chapter 3.** This chapter, over and above the design and methodology of the research, presents the limitations of the study, and any ethical considerations that may have arisen and need to be explained.

Chapter 4 of this paper presents and discusses the results of the survey described in both the quantitative and qualitative formats, including a summary of responses to the survey and an analysis of the responses based on four unifying themes, namely **Theme 1**: the role of finance in growing the healthcare sector; **Theme 2:** Sources of funding infrastructure and their relevance to Africa's healthcare infrastructure; **Theme 3:** Exploring merits and demerits of various models of financing healthcare in the African healthcare setting; and lastly **Theme 4**: looking at factors that affect investability of healthcare as a sector.

The analysis of the results in respect of the perspectives of financiers on the themes presented in **Chapter 4** are translated to what this means for the future of funding healthcare infrastructure in Africa, providing the reader with the thinking on the next steps in this subject area, which leads to **Chapter 5**, the concluding remarks.

In addition areas of future research will be stated in **Chapter 5**, so that researchers can further explore other aspects of this subject not covered in this research, especially as stated in

the delimitations of the study. **Chapter 5**, also include thoughts relating to the significance of this study.

2 LITERATURE REVIEW

"*Strengthening local health-management structures and bringing them closer to the community allows for better management of the workforce and of the limited resources available, based on actual community needs.*"

Liza Kimbo, Chief Executive Officer, Viva Afya, a healthcare company in Kenya

The literature review focuses specifically on the three research questions posed in **Chapter 1**. A literature review on models for healthcare financing being the subject of the review, the macro context of the role of finance in healthcare in general, sources of funding for healthcare and the investability of the sector are all explored here. African country contexts are taken into account in the analysis and review appreciating that Africa is not homogenous. However in that heterogeneity, the healthcare infrastructure challenges are fairly uniform, but only differ in form and severity.

There are two contrasting narratives about the state of infrastructure in Africa: one that depicts infrastructure as being in a sorry state and a far cry from what would be labelled developed, and the other that tells a story of hope as many players seek to change the status quo. The former narrative has resulted in underinvestment through traditional funding routes. The latter narrative, however, has resulted in a plethora of innovations that, having been used elsewhere, are finding a home in Africa but are still at nascence. This literature review seeks to explore both narratives, providing a more balanced lens through which to view the world of healthcare infrastructure in Africa.

Much of the literature on the topic stems from financing infrastructure in general, but the review highlights the nuances peculiar to healthcare. Content analysis was used to evaluate the research reports for the variables or concepts studied and their relevance to the problem, the adequacy of the research methods, the interpretation of findings, and the applicability of findings to financing infrastructure in Africa.

This review will also explain the relevance, merits and demerits of these financing models in Africa's healthcare markets, deducing whether there is a set of most appropriate funding models that policy makers should consider for most African countries.

The literature review was done using the search words *financing infrastructure, healthcare infrastructure in Africa, healthcare funding, and healthcare financing, finance and healthcare* all in different permutations. Research reports were included in the review if they indicated that the research involved the phrases infrastructure financing or healthcare financing, provided they were published in a refereed journal, and had implications for the future of financing healthcare

infrastructure in Africa. To ensure a thorough review, sampling of the literature occurred in four steps.

- Firstly, various data sources on theories of financing social goods such as from the World Bank, WHO Statistical Information System for data on government health expenditure; and International Finance Cooperation were utilised in addition to scholarly work on financing infrastructure, financing healthcare in developing countries and scholarly work on possible financing models for entrepreneurship as relevant in developing countries, were explored.
- Secondly, computer database systems of Medline, PubMed, Google Scholar, Science Direct and CINAHL were searched with four key words in various combinations - infrastructure, healthcare, financing, and Africa - producing a total of 152 possible papers from 1999 – 2015. These were eventually narrowed to the referenced articles. In addition policy documents on alternative financing models for healthcare, or for any other structures used elsewhere such as financing roads, transport infrastructure and energy, were also reviewed.
- Thirdly, the reference lists from these initial articles and policy documents were examined for related research reports, and those meeting the inclusion criteria were included in the review.
- Lastly, journals associated with infrastructure financing were searched manually for relevant research. The topic of healthcare infrastructure financing in Africa has not been reviewed as much as healthcare financing which is essentially healthcare insurance. Unfortunately the latter, while a key part of financing healthcare, is excluded in this paper.

2.1 The macro context of infrastructure financing in Africa

The role of infrastructure in enhancing economic development has been well documented both in the academic literature and in the policy debate spheres (Asiedu, 2006, Ayyagari *et al*., 2013, Bhattacharya *et al*., 2012, Bond, 1999, Cavallo and Daude, 2011, Chanda, 2010, Chanda and Bhattacharjee, 2014, Della Croce and Gatti, 2014, Hellowell, 2013, Normand and Thomas, 2008, Outreville, 2007, Robert, 2003, Stephen, 2001, Stewart and Yermo, 2012b, Tulchinsky and Varavikova, 2014, Weber and Alfen, 2010).

As considered by Sutherland, Egert, Araujo and Kozluk (2009), who look at the return on investments for infrastructure projects in 21 countries, there is a positive relationship between investing in infrastructure with GDP growth. Although the work of the authors did not include much of Africa, one can extend this analysis to Africa as a whole. In addition, the industries covered in the study did not include healthcare as a sector or any social infrastructure (Sutherland *et al.*, 2009). Such analysis is also provided by Meaney and Hope (2013), who note the positive correlation of social infrastructure investments and GDP growth. Of interest, the discussion on financing social infrastructure has resulted in the creation of a bidirectional relationship between infrastructure development and poverty and inequality reduction (Estache and Wodon, 2014, Fauci, 2014, Forrester *et al*., 2014, Meaney and Hope, 2013). In healthcare, global health leaders such as Fauci (2014) attribute this bidirectional relationship to the very nature of what a lack of investments in social infrastructure does to inequality as demonstrated in the recent (2013/2014) Ebola crisis.

Whilst some economists have made a case for investing in healthcare, primarily the general economic infrastructure assets have been studied and found to have a positive impact on the rate of economic growth, with the largest impact coming from telecommunications, roads, and electricity networks (Yang and Mwase, 2012). Unfortunately most of these longitudinal studies do not extend to healthcare and even less so to Africa. Nevertheless, econometric models demonstrate the exemplary benefits of focussed infrastructure investments as happened in other regions (Yang and Mwase, 2012, Gupta, 2014, Aoyagi *et al*., 2014).

With the realisation that African governments will not successfully bridge the infrastructure financing gaps by relying solely on appropriation, scholars agree that other funding sources in the private sector are required. As Della Croce and Gatti (2014) maintain, while the costs of funding the region's infrastructure needs far exceed its existing funding sources, the costs are trivial relative to the size of world capital markets. It is this reality that encourages this review to explore ways of tapping into diverse sources of funding and, more importantly, ascertaining what models of financing would then be suitable for the capital costs of healthcare.

Research also reveals that the inability of Africa to finance its infrastructure requirements is not just a capacity constraint, but has become an institutional and organisational one (Ladekarl and Zervos, 2004, Ayyagari *et al*., 2013, Robert, 2003, Bhattacharya *et al*., 2012, Ahmad, 2014). This calls for other factors such as Africa's investability to be looked at. As Ahmad (2014) articulates, for many developing countries the country's sovereign rating in the capital markets becomes a factor in investability. With these challenges, some opportunities emerge; accordingly, and some financing trends are noted and compared to the rest of the world:

- A mega trend perhaps is the rise in the involvement of the public-private partnerships in healthcare (Bhattacharya *et al.*, 2012; IFC, 2011; Lu *et al.*, 2010). With examples coming from all over the continent, investment in healthcare facilities has largely been led by various consortium arrangements that have borrowed from the success of public finance initiatives in countries like the United Kingdom (UK), as illustrated by analysis of the UK's public finance initiative (Hellowell, 2013). Vast amounts of literature have determined the success of the public-private financing initiatives in informing financing arrangements for the future hospital. South Africa, for example, has had its fair share of success and disappointment when it comes to public-private partnerships even though most problems have been about service delivery in healthcare (Cruz and Marques, 2013; Kula and Fryatt, 2013).
- China remains by far the biggest financier of Africa's infrastructure (Azulle and Hundal, 2013). While not much of the current funding is for healthcare infrastructure, it is probable that China will soon be investing in social infrastructure as demonstrated in its recent involvement in the global vaccine fund (UNICEF, 2015).

- There is an increase in South-to-South collaboration in infrastructure projects, with countries such as India and Brazil playing a role in providing support for Africa's infrastructure, especially healthcare infrastructure (Paul, 2014). At times this infrastructure is set up to add convenience to the investing country's own businesses (Chaudhuri and Mukhopadhyay, 2014).
- With financial deepening and increased financial inclusion in some parts of Africa, private sector capital is mobilising fast, but with selective investments focussing on economic infrastructure and very little on social infrastructure (Azulle and Hundal, 2013; Della Croce and Gatti, 2014).This trend makes it more imperative to look at alternatives for social infrastructure funding, including healthcare. Babarinde (2012) provides a report on private equity's role in infrastructure that illustrates this trend well, demonstrating that deals follow places where there is better financial deepening such as South Africa
- WHO's analysis of national health accounts indicates infrastructure spending is a major lever for fiscal policy; and consequently African governments appear to be investing more on healthcare infrastructure (WHO, 2013). This is confirmed by other authors although the exact figures on healthcare infrastructure are not clearly categorised (Sanni and Hashim, 2011; Lagomarsino *et al*., 2012; Ratha *et al*., 2008). This is potentially problematic, because healthcare spend overall does not indicate the intention of expanding healthcare infrastructure particularly in Africa where the burden of disease has never been matched by appropriate investments (Spaan *et al.*, 2012).
- While other regions of the world are divesting from public investments in healthcare; for example, infrastructure spending in Europe declined from about 5% to about 2.5% of GDP in the 2000s (Mossialos *et al*., 2002, Velenyi and Smitz, 2014), and recently to about 2% of GDP (WHO 2013), Africa needs to invest more due to the epidemiologic and disease challenge facing the continent. Some authors postulate that this absolute reduction in spending in infrastructure is due to the rewards of previous investing in healthcare, while others attribute this to the reduction in burden of diseases, which has seen the system shift to primary healthcare (Mossialos *et al.* 2002, Velenyi and Smitz, 2014). Indeed for Africa, the lesson has been translated to the Abuja Declaration that mandates the African governments to allocate 15% of their GDP to healthcare, with which no African government has complied (WHO, 2013). This underscores the

importance of looking for alternative sources to fund healthcare infrastructure outside the national fiscus (McIntyre and Doherty, 2010).

- As an asset class, pure greenfield infrastructure fundraising is still very limited in Africa (Mills and Hsu, 2014). As illustrated by this excerpt from the Lion'sHead 2012 report "*at the end of 2012, greenfield projects represented only 11% of total global infrastructure fundraising*" (Lion'sHead, 2013). However, other reports from private equity analysis illustrate that the interest is increasing and certainly the same can be said for healthcare (Babarinde, 2012, Mbaku, 2013, Della Croce and Gatti, 2014). The question that needs to be further investigated is whether healthcare is becoming a more attractive sector, despite Africa's lack of attractiveness as an investment destination. A glimpse of the factors that affect investability is explored in this paper's review of the literature.
- Another trend is Africa's growing middle class – they are likely to be willing to pay more for better medical treatment. More innovation is needed too in defining the kind of healthcare infrastructure Africa needs going forward (Alvarez and Sauvant, 2011). Redefining healthcare infrastructure in some parts of the world has been crucial, evolving to include manufacturing infrastructure for the development of the biotech industry, and this is critical for Africa.

Even though these trends depict a positive upward investment uptake on infrastructure, the literature on financing infrastructure has focussed largely on economic rather than social infrastructure. Investments in social infrastructure would not only improve the economic fortunes of a country, but would ensure that the investments in other forms of physical infrastructure have better synergistic (leveraged) returns (Della Croce and Gatti, 2014, Suhrcke *et al*., 2006, Pradhan *et al*., 2011). It can therefore be assumed, at least in theory, that social infrastructure investments should yield enhanced overall gains, and are an ingredient to leap-frogging Africa to the next phase of development. We look into what comprises healthcare infrastructure in turn.

2.2 What comprises healthcare infrastructure?

Infrastructure is contextualised by Collier (2014): "*Infrastructure is about infra the internal support that makes something work all the time and about structure, the universal agreements that makes all the parts work together all the time. Infrastructure becomes all the parts of a system that support an essential activity*"

Healthcare infrastructure is *any component of recording and organising, analysing and managing the health status of individuals and populations* (Schatz and Berlin Jr, 2011). The aim of the infrastructure is to create a system that will achieve health outcomes, wherein health is defined by the World Health Organisation in the 70s (Callahan, 1973) as a state of physical, spiritual and mental wellbeing. In essence, healthcare infrastructure comprises "*both the physical resources, the social and human capital requirements required to run such a system"* (Kickbusch and Nutbeam, 1998). This means that healthcare infrastructure cannot be divorced entirely from the delivery of healthcare itself, even though the models of financing are vastly different. Indeed, scholarly work has established the need to link financing of capital investments with the operating expenditures that is the health services financing (Vecchi *et al.*, 2013).

Infrastructure gaps are much discussed in the development sector, and social infrastructure gaps are often given separate attention (Vecchi *et al.*, 2013). An infrastructure financing gap can be defined as the difference between investment needs and resources, or the funds needed and available for financing infrastructure and these are often difficult to estimate (Weber and Alfen, 2010).

There are two needs for healthcare financing therefore; the infrastructure and the service delivery/operations. According to the World Bank survey on Africa's healthcare infrastructure, the former infrastructure represents only five percent of the total health spending in Africa, which is not adequate to meet the demands for healthcare (IFC, 2011). The rest of the expenditure on healthcare is on operations, which is service delivery amounting globally to $88 trillion annually (IFC, 2011) but barely meeting ten percent of the health needs. As has been seen around the world, research demonstrates that healthcare expenditures have become a performance indicator for government efficiency with newer ways of funding healthcare needed. Infrastructure investments in healthcare while part capitation costs also need to be

staggered and, together with recurring expenses for running an integrated healthcare system, has created a market for private investment and management (IFC 2011).

Weber and Alfen (2010), provide an analysis of the reasons why the two forms of financing cannot be divorced, stating that the absorptive capacity of any newly established infrastructure depends on funding for the health services and operations. Similar viewpoints are also articulated by other scholars and is summarised below, with common threads to the situation in most African countries on why financing operations cannot be divorced from financing capital costs (Smith and Normand, 2009, Tulchinsky and Varavikova, 2014, Waheed, 2013).

- New facilities in Africa are unable to function because of shortages of recurrent resources (Sambo *et al.,* 2011);
- Healthcare facilities at times are supplied with equipment but with no qualified staff to operate and maintain them. An indicator for this is the large number of unfilled specialised healthcare personnel posts (Waheed, 2013);
- A common sight, especially for public infrastructure, is poorly maintained buildings, equipment, facilities, and so on, with a need to always invest in long-term infrastructure (Waheed, 2013; Tulchinsky and Varavikova, 2014);
- At times construction is complete but there is no operational funding, resulting in the many "white-elephant" hospitals, where beautiful facilities sit and gather dust while waiting for equipment, medical personnel, and patients. If the latter happens, the result is a shorter lifespan of investments, hence the need to look at health services and health infrastructure financing in tandem (Smith and Normand, 2009).

Notwithstanding the linkage between the two needs for financing, the focus of this literature review is financing physical infrastructure which includes brick and mortar assets such as the real estate of the hospitals and the medical equipment that allows the physical infrastructure to deliver the health outcomes. We start by clarifying the role of finance in developing health systems, firstly to meet the healthcare demands of the population; and secondly to develop healthcare as an investable sector that could in itself spur economic growth.

2.3 The role of finance in developing healthcare systems

This section details various themes that emerge from the literature review on what role finance plays in developing healthcare systems. This thematic approach is adapted from Sambo *et al* (2011), regarding the analysis of how investing in healthcare may spur the sector from just meeting healthcare needs, to contributing indirectly to GDP through improved productivity and lastly to contributing to GDP due to increased investability of the sector as an asset class. Indeed, when the sector becomes investable it could increase a country's overall competitive advantage.

a. Finance leads to economic growth which leads to improved health systems

The seminal report on investing in health demonstrated the link between health and economic development in low-income countries (Sachs, 2002b, Sachs, 2002a). While it has long been recognised that increased national wealth is associated with improved health, it is only slightly over a decade ago that the contribution of better health to economic growth was widely accepted by African states (Sachs, 2002b, AU, 2001). The outcome of this realisation was the Abuja Declaration (AU, 2001), and the recent drive by WHO to make sure that member states pay attention to healthcare infrastructure (WHO, 2013).

A deep exploration of infrastructure spending however reveals that social infrastructure, in particular, healthcare - is still an orphan asset in Africa (Poullier, 2002). For most of Africa, it is regarded largely as a governmental responsibility, at the least, or as the space for discerning healthcare entrepreneurs, at the most. This is also confirmed by scholarly work that demonstrates that this state is perpetuated by an overall reduced social spending by governments (Antonopoulos and Kim, 2011).

With the attributes of healthcare depicted above, there is a need to discuss the nuanced role that finance would play in stimulating the growth of the healthcare sector. An argument has been made globally on the sequencing effect between economic growth and finance, and perhaps the same could be extended to healthcare on the nature of the bidirectional relationship of investing in healthcare and its effects on economic growth (Fedderke *et al*., 2006, Gaag and Stimac, 2012, Mills and Hsu, 2014, Sachs, 2002b).

b. Catalytic financing leads to improved health outcomes, with or without economic growth

A case is made that finance is a catalyst for the growth of the health sector (PWC, 2013). The world recently recognised that investments into healthcare infrastructure are urgent when faced with the Ebola crisis, and this particular crisis has seen foreign aid quadruple in some western African countries (Fauci, 2014, Forrester *et al*., 2014). The phenomenon of improving capacity post crisis in the health sector is not new, transcending post-Tsunami, to the earthquake in Pakistan, and to Rwandan post-genocide nation building (IFC, 2011, Hameed, 2014). The view therefore is that finance should be used to stimulate growth for the long run, and it is plausible that this long term approach is gaining momentum in African governments' circles which is where healthcare infrastructure development becomes essential.

Leach-Kemon *et al* (2012) examined the stifled growth of the health sector caused by the financial crisis, despite the fact that this asset class has been labelled recession proof. This stifling effect has been seen elsewhere (de Belvis *et al*., 2012). For Africa, the health sector has largely relied on donor funding, and the effect of shortage of capital was felt post the 2008 financial crisis. This could be an argument demonstrating that economic growth does indeed affect healthcare investments, although more research is needed to examine the effect of this global financial crisis.

In recent years, IFC has seen a renewed interest in Africa's healthcare sector, for example with Abraaj; a private equity firm opening up a $ 1billion fund for investing in Africa's healthcare infrastructure (Taussig and Delios, 2014). The focus here is that despite the economic status of nations, finance could catalyse the growth of a sector and the investments made so far demonstrate the catalytic nature of the financing provided (Taussig and Delios, 2014). A case is made therefore that finance and not economic growth per-se, would lead the growth of the industry, but more empirical evidence is needed to support this viewpoint.

c. Both finance and economic growth are needed to grow the healthcare sector

A deeper analysis would possibly reveal a different angle; that it is not only finance that drives growth and innovation in the health sector, but the demand for cheaper technology, the changing demographic fortunes of populations and epidemiological transition that many a

developed country is facing (Porter, 2010, Christensen, 2013). To ensure the growth of these variables, Porter (2010), for example, argues that both are needed, but the conditions that enable demand financing should be in place for the financing part to yield results.

Whichever narrative one adopts, finance plays a role in the growth of the healthcare sector, be it under economic growth or catalytic finance stimulating the growth of the industry. Perhaps research using panel data is needed on the sequencing of these crucial factors.

d. Creating healthcare infrastructure as an asset class

Any infrastructure should be built for its exact purpose in order to produce value (Gaag and Stimac, 2012). As such, decisions on capital investments in healthcare infrastructure have a bearing on how health would be delivered in the next decades (WHO, 2013). Evidence shows that in terms of returns on assets and returns on capital employed, healthcare infrastructure has been deemed inefficient (Aiken *et al*., 2001). Often the hospital buildings are too large , wrongly positioned and/or often fail to exploit the efficiency and quality-enhancing opportunities afforded by changes in clinical practice and technology (WHO, 2013).

An inherent challenge on investing in healthcare infrastructure is lack of optimal asset utilisation models. For many health systems, the costs, risks and value per capita for infrastructure are ignored as revenue comes from different streams, with hospital managers having little control of the former and much more interests in the latter (Porter, 2010). Indeed, as is the case for most parts of Africa, incentives to manage assets efficiently are non-existent, resulting in principal agency theory scenarios (Bateman, 2013, Sambo *et al*., 2011). Practices about this information asymmetry and principal agent theory scenarios are prevalent, and most hospitals remain stuck with the inefficient traditional capital allocation theory (Montagu and Harding, 2012, Porter, 2010).

In addition, Montagu and Harding (2012) analyse the value of the hospital real estate and the need to look at innovative financing models to fund the hospitals of the future. At the centre of this analysis is the need to see the hospital environment as a centre of innovation to efficiently and optimally deliver on the needs of the clients it serves.

The good news is that literature on the value of hospital real estate demonstrates that strategic and efficient investment into infrastructure improves the long term value of the

hospital (Hellowell, 2013). According to Hellowell (2013), such improvements result in the hospital being a collateral investment into healthcare infrastructure with other benefits which affect profitability and future cash flows depending on what is meant by strategic and efficient investments into the hospital infrastructure:

- **Healthcare infrastructure investments can improve end-user satisfaction**

  A hospital is a capital and labour asset that needs to be combined creatively to provide services. Besides the value to patients for a better healing environment, Lindholm and Levainen (2006) articulate that by offering functional, pleasant and comfortable working environments with the requested level of amenities, the architecture of workplaces can even lead to a lower staff turnover. This is considered an added value attribute that is very important in a market with many competitors as it can enhance profitability (Lindholm and Leväinen, 2006; Barros *et al.*, 2013; Rechel *et al*., 2009).

- **Healthcare Infrastructure investments can reduce operating costs**

  For a hospital, occupancy cost minimisation is viewed as the lowest cost decision, cost effective for quality space sought. Barros *et al* (2013) refer to this for real estate in general, and that the reduction effect is not only linked to real estate, but includes personnel costs, where a concept adds to a higher production or a lower percentage of absence (Skinner *et al*., 2009). This is more evident as the world moves towards the greening of hospitals (Phelps *et al.*, 2006).

  Reducing costs in any real estate area has a direct and immediate impact on the financial position of an organisation (Rechel *et al.,* 2009). In addition, creating insight into cost structure, minimising life cycle costs, acquisition costs, operational costs, financing costs and other real estate related costs (Lindholm *et al.,* 2006) are useable strategies for reducing costs as added value of real estate. It makes sense, therefore, that healthcare financing looks into the potential future revenues that result from capitation costs. As such no financing can divorce capitation and operating cost infrastructure.

- **Infrastructure investments in healthcare can improve productivity**

  This added value has been widely researched - combining two alternative real estate strategies, that of facilitating and controlling production, operations and service delivery and indeed to promote the human resource objective as has been seen in various industries (Rechel *et al*., 2009, Stephen, 2001, Appel-Meulenbroek and Haynes, 2014, Jensen *et al*., 2013). For a hospital, the productivity aspect can also stem from an improved image of the hospital, which translates into returns as it draws more customers (Marriott *et al.*, 2011). Physical design can be used to create an image for the company among its suppliers, employees, customers, and investors, an indirect way of adding value to the organisation such as demonstrated in one oncology hospital (Śmigielska and Milecki, 2012). As stated above, this also improves the real estate value of infrastructure that could be used as collateral.

These attributes, while not unique to healthcare, have not being fully exploited to enhance the real estate value of hospitals. Doing so will not only improve investability in healthcare, but will also allow investors to have collateral of existing facilities.

2.4 Sources of funding healthcare infrastructure

"*… there is no poverty reduction or socioeconomic development without good health…"*

***Dr Pierre M'pele-Kilebou, WHO Representative to Ethiopia in his keynote address at the Summit* for Healthcare in Africa**

This section borrows from the definitions of funding and financing in Section 1.5, even though most of literature does not distinguish from the two.

Different capital channels can be used to fund infrastructure gaps as the figure below shows. However the suitability of these channels to finance all asset classes has not been studied sufficiently, particularly in healthcare where essentially only the public-private partnership model has been explored at length. Alluded to previously, the emphasis on public sector infrastructure finance includes the following:

1. Healthcare operations and equipment maintenance
2. Building/purchasing new facilities and medical equipment to cater for increased demand
3. Revitalisation of facilities currently being used, and overdue investment

An illustration of the different sources of financing, and how they can be extended to cover the financing gap, is provided below, courtesy of Della Croce and Sharma (2014)

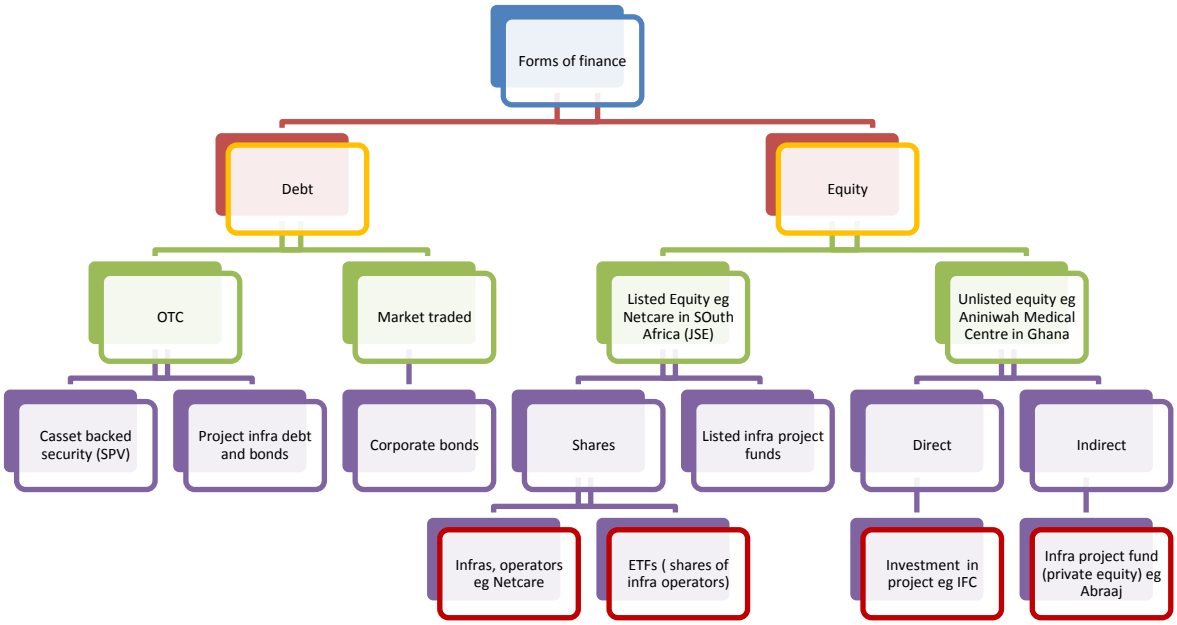


Figure 1: *Funding sources for healthcare infrastructure [Della Croce and Sharma (2014)]*

This section borrows from literature on funding infrastructure in general where financial innovation has opened up different routes of financing which include capital markets and has attracted long term institutional investors (Weber and Alfen, 2010).

2.4.1 Government revenue and role of government in financing healthcare infrastructure

There has been an increased recognition that while social infrastructure is often inadequate, the role that governments play in this space has been evolving over the past decade. Traditionally, the governments' role has largely been to raise revenue to finance the infrastructure gap. Increasingly however, there is need for government to play a mediator, leading and guarantor role in attracting private finance. Needs analysis reveal that this shift needs a mind-set change within the political establishment and such political entrepreneurship is scarce in Africa (Estache and Wodon, 2014). As such, and unsurprisingly, the desire for private financing has not advanced much beyond long wish-lists of politicians (Estache and Wodon, 2014).

Even where governments are willing to play the mediator role with private sector, there are challenges in turning this dream into reality. Some authors attribute this facility failure to the

lack of capacity to design and present projects in detail in a form that is financially attractive to private investors (Bond, 1999, Collier, 2014, Fedderke *et al*., 2006, Hanjra *et al*., 2009, Sanni and Hashim, 2011, Shi and Huang, 2014).This could even be sector–specific as healthcare would require different expertise.

Further, the private sector has been deterred from infrastructure projects in Africa which are more likely to be higher risk, especially with track records of project hold-up once the investment has been approved (Fedderke *et al.,* 2006). While this generalisation cannot be made for healthcare without empirical data; Fedderke and others (2006) present this argument within reason for infrastructure in general; that government interferes with rather than facilitates private sector investments. Governments could start improving efficiency of delivery by creating a better enabling environment for executing infrastructure projects.

Another mediator role for government is negotiating better deals at a transcontinental level, particularly through the regional trade agreements. This reasoning stems from the barrier identified in literature as the poor terms of engagement that Africa has with developed economies and development institutions, where they should be raising finance (Robert, 2003, Stewart and Yermo, 2012b).

In most of Africa, for spurious accounting reasons, countries receiving funding from the World Bank for healthcare have been discouraged from investing in infrastructure projects for a long time (Sanni and Hashim, 2011, Stewart and Yermo, 2012b). This was worsened by the plethora of macroeconomic adjustment programmes that many African countries are still trying to recover from (Smith and Normand, 2009). For example, the restriction on the flow of funds from OECD countries, wherein pension funds are not allowed to hold infrastructure projects in their portfolio is another restriction where active engagement by African governments is needed (Smith and Normand, 2009). Yet while Africa is disadvantaged by these regulations, there has been no lobbying channel for their reconsideration, a role that governments and civil society should play (Smith and Normand, 2009).

Government-owned enterprises could also be structured innovatively to finance healthcare infrastructure. For example, entities such as the Industrial Development Corporation (IDC) in South Africa are a profit-making project finance vehicle that could fund healthcare infrastructure. Such entities exist in one form or another in various countries, even though their

scope could be limited in terms of sector coverage. Of late, the IDC in South Africa has developed several industrial development zones, the recent one being Coega in the Eastern Cape to spur industrial development (COEGA, 2015). Used effectively, such platforms could provide impetus for catalytic growth in a sector as they focus efforts on local provincial or county needs.

The other role of government is also to act as a guarantor for the infrastructure projects (Wang *et al.*, 2012). The challenge however has been that the executors of the project, guaranteed a return by government, have little incentive to monitor management performance. This is confirmed by evidence in literature, that in cases where government guarantees investors a return, there is little scrutiny and due diligence done by the investor of a healthcare project (Fraser *et al*., 2015, Miller and Sardais, 2011).

The above narrative implies that government's role in financing infrastructure or even conducting due diligence before a guarantee; needs to be enhanced so as to have effective public oversight (Vicente and Castillejo, 2012). In addition governments could encourage financial deepening in general, to enable financiers more capable of surmounting information problems to conduct the due diligence (Burger *et al.*, 2012). It is this broader role of government, perhaps even more than the role of direct financing, which should be maximised to enable the development of healthcare infrastructure.

2.4.2 Donor aid

Historically, donor aid has been a major source of infrastructure financing in Africa, but has not really dwelt on the capital intensive projects (Adam and Bevan, 2006, Kragelund, 2011). Indeed as some scholars observe, the presence of donor aid in some African countries has had an untoward effect on the fiscal expenditure on social sectors, with some countries reducing instead of increasing infrastructure spending (Kragelund, 2011). Chatterjee and Giuliano (2012) observe this phenomenon in Ethiopia where for every dollar of donor aid contributed towards healthcare spending, there was a $1.34 reduction in expenditure by government. Often, governments work simultaneously with local partners on specific, often vertical, healthcare programmes. Indeed, lots of gains have been seen, particularly in tackling enormous challenges such as in HIV and AIDS, Maternal and Child health and recently the Ebola challenge in West Africa.

Yet, most donors tend to shy away from infrastructural projects that need a large capital injection (Fauci, 2014). Indeed the realisation by some governments that vertical programming without a long term focus is problematic has helped improve sustainability for most donor programmes, but there has still been criticism on how donor funds are channelled (Sambo *et al.,* 2011).

On the face of it donations may seem to be adding value to the hospital infrastructure, but experience shows that hospital donations can be a burden to the current healthcare system if coming from a flawed donor management system (WHO, 2013). Adverse effects of donations have been presented, for example where the vertical approach to healthcare challenges has been shown to be unsustainable. For instance a hospital may not have the expertise to assess or maintain the donated equipment (Howie *et al.,* 2008).

Countries are therefore establishing common health funds set up to ensure proper planning and sustainability of developing healthcare infrastructure and health education, so as to maintain any investments that otherwise would have been made into the health sector (De Maeseneer *et al.,* 2008). As such the face of donor partnerships is changing, and donors may partner with infrastructure providers to enable a more sustainable development of health systems. Unfortunately most of the donor funding comes restricted, with conditions that need to be met by local governments if funds are accepted. Increasingly, many African countries are becoming reluctant to accept these conditions. Whether this is a good or a bad reaction is yet to be seen.

This paradox is worrying for healthcare infrastructure, especially because many donor countries desperately want to show the help afforded a country through their donations, and may not advocate for co-payments (Sambo *et al.*, 2011). Nevertheless, donor aid is still a huge factor in African healthcare service delivery. The challenge stated by WHO (2013) is that most of it is invested in vertical programmes. Others such as Addison and Anand, (2012), observe that the plethora of funding directed through vertical programmes, such as HIV and AIDS, still has a multiplier effect if channelled to integrated infrastructure programmes (Addison and Anand, 2012). This argument is debateable as the approach to funding a catastrophe is different from financing well planned long term healthcare infrastructure projects.

Other scholars illustrate an increase in donor use of private sector intermediaries who receive aid on behalf of the public sector (Sanni and Hashim, 2011). This, according to the authors, is done in an effort to increase efficiency in service delivery, but some critics claim that using intermediaries reduces the amounts available for infrastructure (Kragelund, 2011). Some donor agencies, instead of directly investing in capital resources, focus rater on the direct capacity development of governments in healthcare by focussing on management talent (Sanni and Hashim 2011).This trend is also criticised heavily for potentially reducing the focus on building infrastructure in favour of improving service delivery among donors (Sanni and Hashim, 2011). It is likely, however, that there has been an increase in infrastructure spending on healthcare through the use of intermediaries. Anecdotal evidence attests to this trend, for example with the rise of private equity players backed by donors such as Abraaj[1] and Aureus Capital, currently dominating the African healthcare market.

Consequently, donor agencies have also been involved in structured financing mechanisms such as the World Bank's innovating financing initiative for immunisation, the Global Alliance for Vaccines and Immunisation, the Global Fund for HIV, TB and Malaria and the newly formed Global Fund for Maternal and Child Health (WHO, 2013). These structures are discussed separately but they link infrastructure spending to social concerns in an effort to make infrastructure projects more viable to groups that seek to close inequality gaps in healthcare (Kragelund, 2011). The result has been an increased presence of donor groups such as DFID, USAID and the Gates Foundation involved in infrastructure investment programmes in Africa (Addison and Anand, 2012). This could be hailed as a new era to create financing mechanisms that work for Africa.

In conclusion, there is evidence of a changing role of donors on how they are contributing to healthcare infrastructure. Donor activities have transformed from just being humanitarian endeavours, but now include more innovative financing mechanisms, such as providing guarantee instruments or even financing specifically to improve creditworthiness, and/or becoming strategic intermediaries. Such practices have been shown to facilitate market access for healthcare infrastructure.

2.4.3 Regional development banks

[1] These are private equity firms operating in infrastructure in Africa

The role of the development banks in financing infrastructure in Africa has never been more critical and the banks remain the most important funding source for many African countries (Azulle and Hundal, 2013). AFDB and DBSA are two that have played this role in financing infrastructure, where several platforms exist, from which healthcare infrastructure needs could be filled (Beck *et al.,* 2009). AFDB's Infrastructure Financing Facility (AIFF) initiative was set up recently to match the risk profile and financing needs of projects largely through senior debt and guarantees (Azulle and Hundal, 2013).

Regional banks are refocussing their efforts with a renewed interest in the social infrastructure as well. For example, in 2013 Sub-Saharan Africa was the main client for IFC infrastructure projects, accounting for 30% of the global total; with $1 billion investments in healthcare (Estache and Wodon, 2014). Despite this, some authors contend there is a case for new development banks with the BRIC's coming timeously to fulfil infrastructure needs (Bhattacharya and Romani, 2013).

Another funding source lies with the World Bank's profit-making arm, the IFC, that is involved in some profitable initiatives. Ultimately, it remains the responsibility of African governments to improve their sovereign investability and creditworthiness so as to benefit from the offerings of development banks.

2.4.4 Foreign Direct Investments

A major part of empirical literature on Foreign Direct Investment (FDI) as a funding source for infrastructure is analytical in nature, with an apparent polarisation of views for and against FDI (Chanda and Bhattacharjee, 2014, Paul, 2014, Chaudhuri and Mukhopadhyay, 2014, Wang *et al*., 2012, Adjasi *et al*., 2012, Darley, 2012).

FDI flows to Sub-Saharan Africa have increased over the past decade, but appear to be mostly in enclave sectors reaching an estimated $27.1 billion in 2013 (Adjasi *et al.,* 2012). Empirical evidence on the likely impact of FDI in health service has not been fully investigated. The literature provides an overview of the trends of FDI and factors that determine the destination of the MNCs (Chanda and Bhattacharjee, 2014; Paul, 2014; Saha and Rowley, 2015).

Increasingly, foreign investors are looking for alpha opportunities in the healthcare sector in areas such as medical technology, diagnostics, healthcare education and training (Outreville, 2007). As such, ministers of science and technology in African countries have co-created conducive environments that would attract such funding (Darley, 2012).

Recently, Chaudhuri and Mukhopadhyay (2014) investigated the effects of FDI in the healthcare sector in developing countries, using the framework of three-sector, full-employment general equilibrium model. The results of this analysis indicate that although FDI of the type which is specific to the healthcare sector raises the human capital endowment of the economy, it may adversely affect social welfare spending by governments. The results of the authors' analysis are similar to what has been found in other industries, especially energy. This raises the question about the desirability of allowing entry of foreign capital in the healthcare sector that in turn generates externalities.

An interesting trend is the flow of FDI through South-to-South business collaborations (Chaudhuri and Mukhopadhyay, 2014). This trend is dominated by China but supported by the investor governments of India and Brazil, perhaps spurred by the economic collaboration among the BRICs member countries.

Chanda (2010) provides analysis of the major hurdles that MNCs face when funding healthcare and in particular hospitals. Although this analysis is specific to India, it has many similarities with the challenges that face Africa - including constraints related to the cost of doing business, such as the high initial establishment costs, low health insurance penetration, manpower shortages, high cost of medical equipment, and regulatory deficiencies (Chanda, 2010). Africa has additional challenges such as energy shortages and inherent political instability that face some countries (Asiedu, 2006).

Various arrangements and regulations exist in countries as to how FDI can flow with regards healthcare (Outreville, 2007). In some countries, there is an automatic route that does not require prior approval either by the government or central bank. In these countries, investors are only required to notify the concerned of any receipt of inward remittances.

However, FDI flows are a source of political dissent in many African countries, with policies often flaunted in favour of FDI in a bid to create jobs for the local populace (Wang *et al.,* 2012).

Hindrances to expanding this source of finance for the health sector are similar to those listed for private equity, and include lack of quality assets worth the investment and, if present, there is lack of size (Herrera-Echeverri *et al*., 2014, Chaudhuri and Mukhopadhyay, 2014). The often-cited challenge of lack of transparency could improve through better corporate governance and financial deepening that could lead to most of the healthcare investments being listed.

A discussion on FDI is not complete without considering the rise of China in the financing world. Evidence demonstrates that this rise is not a haphazard phenomenon but a much-needed intervention for Africa's infrastructure needs (Shi and Huang, 2014). The relationship is reciprocal, with African governments obtaining infrastructure finance, albeit with conditions attached, and the Chinese in turn obtaining rights to resource extraction (Davies, 2011). The modus operandi is such that infrastructure is designed, built, financed and transferred at times with commitment technology, that African governments are locked into (Mohan, 2013, Nott, 2013) Critics of the Chinese factor in Africa cite opacity of transaction operations that make it difficult to quantify the value of the Chinese near-monopolist behaviour (Davies, 2011).

Another group of critics claim that China, despite supporting Africa's infrastructure needs, seems to be investing less in social infrastructure such as education and healthcare, and lacks integration in development planning. This might be changing however as evidenced by China's financing of GAVI's immunisation programme (UNICEF, 2015). The diagram below shows who has been financing infrastructure in Africa, based on analysis done for 2012. In healthcare, a similar but different picture is depicted:

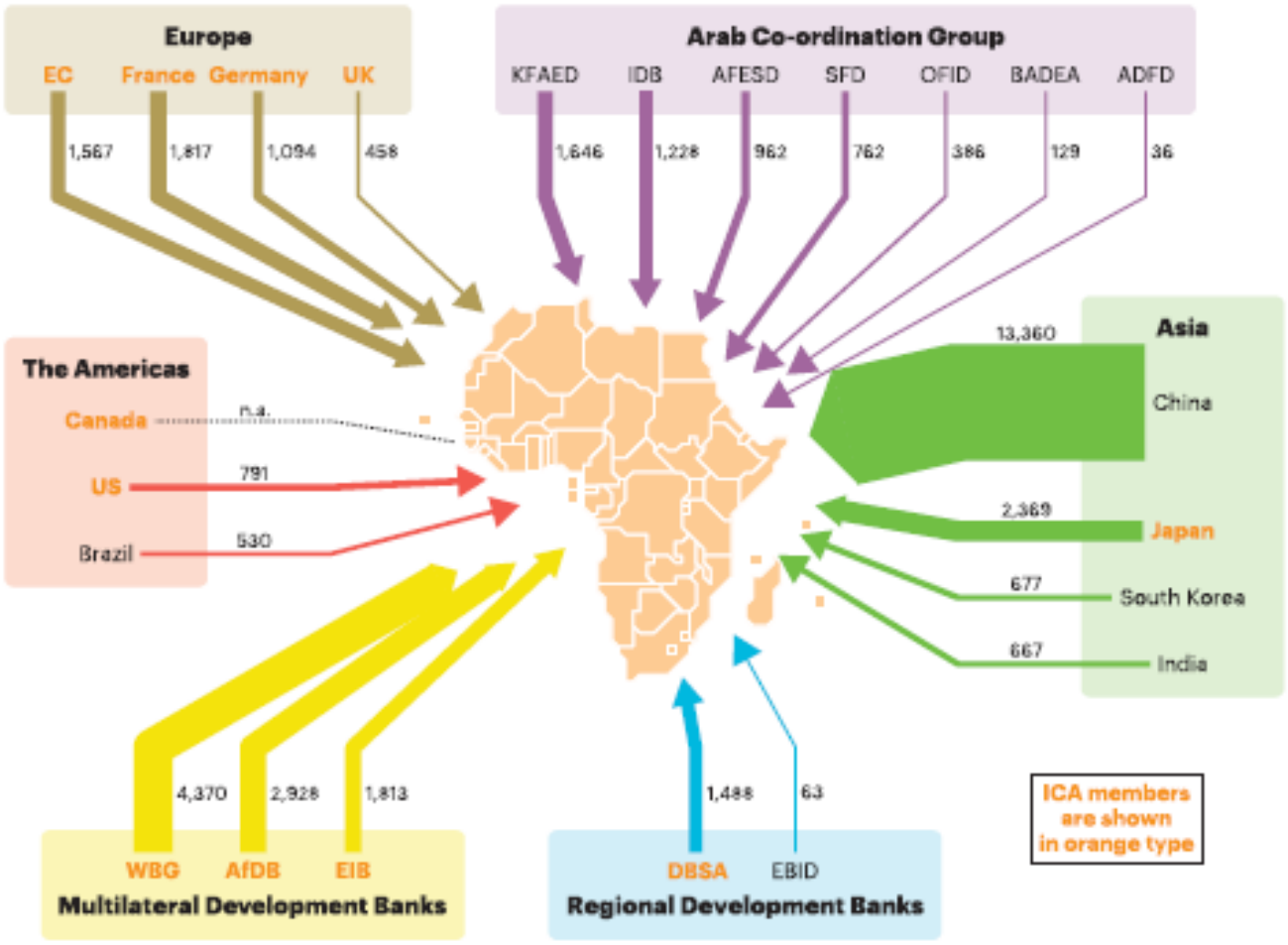


Figure 2 : *ICA illustration of who is financing Africa's infrastructure (Source ICA* ***www.ica.org/infrastructurefinancing/Africa)***

In an analysis by PWC (2012) on the profound growth of the Indian healthcare sector which is the closest market from which Africa could learn, commercial banks still provided long term financing (typically up to 20 years) for healthcare infrastructure. The private sector has seen an increase in the number of individual investors which has also attracted foreign direct investments, external commercial borrowing, and a growing private equity market. However, the exponential growth in the Indian healthcare market has been largely spurred by investments from the Indian government by providing subsidies, incentives and government-sponsored schemes, together with dedicated budgets for rural and urban health. In such an

environment, venture capital and private equity firms start stimulating growth, a trend that African governments can copy to catalyse the healthcare industry.

In conclusion, there are different funding sources for these types of emphasis which in turn attract different financing mechanisms. Whilst the sources of funds may be limited, there are a variety of financing mechanisms that can be employed to match the cash flow of these funds to the cash flow required to finance the establishment of the healthcare infrastructure. An analysis of the suitability, relevance and the applicability of these funding sources in funding healthcare in Africa is however needed.

2.4.5 Private finance

Some scholars observe the strong support for injection of private capital into healthcare infrastructure. Customers are wary of full-scale healthcare privatisation given that there is a basic package that is a public good (PWC, 2013, Jacobson and Tarr, 1995, Meaney and Hope, 2013, Berwick *et al*., 2008).

2.4.5.1 Commercial and investment banks

With the growth in service sectors and healthcare in particular, the role of commercial banks and other lending institutions acquires a special significance. Historically, only a minute part of the financing for developing-country infrastructure projects has been provided by commercial banks. Where this has occurred, it has been in conjunction with officially-backed export credit agencies or multilateral agencies (Vecchi *et a.,* 2013; Collier, 2014).

Commercial banks have traditionally played a pivotal role in Africa's financial system, transforming savings into long-term capital. There is evidence that the banking model in Africa has evolved, however, becoming increasingly dominated by wholesale markets (Meaney and Hope, 2013). Disintermediation is taking place in Africa with institutional investors also becoming central players as providers of long-term capital for infrastructure (OECD, 2013, Inderst and Stewart, 2014).

Debt financing from banks is at times the only available route for raising capital for smaller healthcare providers and entrepreneurs (Babarinde, 2012, Puentes and Thompson, 2012, Inderst and Stewart, 2014). The majority of long-term financing for entrepreneurial healthcare

endeavours is obtained through bank loans from commercial banks. Large commercial banks become involved in the construction of facilities, and depending on the nature of the operations, finance the medical equipment. The interest rates in debt financing in Africa are high, in some instances as high as 30%. This has the untoward effect of increasing the cost of capital and consequently the cost of delivering healthcare. For the commercial bank, different competencies are required to assess the risk and return of this asset class.

There is evidence that commercial banks have retreated from developing-country project financing giving way to other players in the field, particularly players who would be ideal partners in PPPs (Della Croce and Gatti, 2014). According to Collier (2014), this contraction follows on the changing business strategies within the financial services industry especially the role of intermediaries. For example, a Ghanaian electricity project which had projected yield of 20% in the aftermath of the financial crisis was not fully subscribed, despite the good governance ratings of the government of Ghana (Ayyagari *et al*., 2013, Burger *et al*., 2012).

Most banks have a healthcare portfolio but without a specific focus on healthcare delivery organisations. Their portfolios are mostly concentrated in pharma, biotech and clinical research sectors. Some of the key observations from several authors are presented below:

- The current environment is favourable for investments in healthcare delivery projects.
- Past experience in healthcare delivery has been good with negligible defaults.
- Banks have research teams for healthcare but some have no specific domain expertise in healthcare delivery; relying on their own due diligence of a deal and at times on publicly available information and specific reports.

2.4.5.2 Unlisted equity, the growing role of institutional investors

There has been a fundamental shift in how institutional investors view infrastructure as an asset class, with more and more players emerging to the playing field. This means that even healthcare as a sector is likely to see an increase in the number of institutional investors. Unlisted equities do not benefit from an active liquid secondary market (Inderst and Stewart, 2014). Their suitability to long-term investors makes Africa's pension and mutual funds an attractive investor group for infrastructure, provided, as some authors observe, the risk and

return profile of the infrastructure assets is attractive (Blanc-Brude and Ismail, 2013). In addition, the lack of liquidity of these instruments also implies that the universe of possible interested investors is only a subset of the more general group of investors on debt and equity markets (Stewart and Yermo, 2012a).

In principle, the long-term investment horizon of pension funds and other institutional investors should make them natural investors in less liquid, long-term assets, but until recently, they tended to shy away from healthcare infrastructure (Della Croce *et al.,* 2011). Infrastructure projects are long-term investments that could match the long duration of pension liabilities. In addition, infrastructure assets linked to inflation such as healthcare assets could hedge pension funds liabilities' sensibility to increasing inflation (Stewart and Yermo, 2012b).

Foreign institutional investors form part of this category, albeit with different nuances. They include hedge funds, insurance companies, pension funds and mutual funds. Foreign institution investors are often subject to regulatory scrutiny that places limits on their involvement in healthcare, including limits on ownership of local companies. Once operating, infrastructure is not inherently a risky investment for institutional investors (Della Croce *et al.,* 2011).

Infrastructure projects in Africa, which start off as safe boring assets turn into high risk ventures, with high required rates of return.. An interesting example, though not in the healthcare sector, is the electricity generation project in Ghana, and a fortiori in most of the rest of Africa, is classified not as a utility but as a frontier market project (Della Croce *et al.,* 2011). Despite the rapid growth of the Ghanaian economy, the country as alluded to previously is still regarded as unsuited to European pension fund investments; and the reasons for this remain unclear. If Ghana does not qualify for European pension funds, it is probable that most African countries are still not seen as a suitable destination for such funds.

Inderst (2009) and Stewart and Yermo (2012) have shown that despite a limited direct average allocation to infrastructure, pension funds are allocating important percentages to infrastructure either in the form of (listed and unlisted) equity or fixed income. In addition, Della Croce and Gatti (2014) recently provided an analysis demonstrating an increased interest in

infrastructure investments for most pension funds. Although this is not a traditional investment model for insurance companies, things are changing – albeit more slowly with regards Africa.

Inderst covers a group of about 200 insurance companies worldwide with an ass*et al*location dedicated to infrastructure (Inderst, 2010). The large majority of the firms are located in Europe and the United States, with Asia representing about 20% of them. The typical investment strategy (85%) is to commit funds to unlisted infrastructure; funds managed by external advisors, followed by direct investments in SPVs and by investments in listed infrastructure funds. Insurance companies typically invest in primary equity. However, the involvement of insurance companies raises a unique discussion point for the healthcare sector as some have primary assets such as hospitals as part of their business model, and compete to reduce pay-outs in managed care.

Pension funds in particular have their own way of assessing risk especially if projects are accessing funding from the OECD countries (Collier, 2014). For example, the OECD regulation that pension funds invest only in A rated assets is a potential barrier for healthcare infrastructure (Collier, 2014). Chances of these infrastructure projects reaching A rating are slim. In addition the same financial regulation that compels pension funds to equate safety with liquidity proves a barrier for African healthcare infrastructure projects to access finance from these funds. This is surprising (Broadbent *et al.,* 2008), as one would think the liquidity of assets is irrelevant since pension funds have long term obligations. Hence, regulations which equate safety with liquidity might not only be damaging for Africa but also counterproductive to their core objective.

2.4.5.3 Private equity

As alluded to by Babarinde (2012), private equity (PE) is now emerging as one of the preferential forms of funding for Africa's growth. In the traditional sense, PE funds invest in companies with a proven track record of profitability and sustainable growth. However the challenge for most private equity players is the limited deal flow, as healthcare needs do not match the supply of deals (Lion'sHead, 2013, Cumming and Johan, 2013). As such, private equity firms in Africa are increasingly becoming involved in greenfield investments, with a need to provide not only the capital but also adequate strategic planning and management skills sets for growth (Duran *et al.,* 2013). Some PE funds are keen on investing in the healthcare sector

given the high growth and recession-proof nature of the industry (Babarinde, 2012, Gemson *et al*., 2012, Lion'sHead, 2013).

Factors relating to scalability, management bandwidth, workforce and lack of entrepreneurship are the major deterrents in the African market (Babarinde, 2012). In some markets, particularly in Asia, PE firms sense a strong opportunity to tap the market for healthcare services in semi-urban and rural areas , but only a few want to be involved in Africa's healthcare sector (Duran *et al.,* 2013). In some emerging economies, for example in India, around 20% of new PE or VC fund corpuses are expected to be invested into the healthcare services (PWC, 2013).

2.4.5.4 Venture capital funds

In general venture capital in its formal state remains scarce in Africa and even scarcer in the realm of infrastructure (Chakma *et al*., 2013, Jones and Mlambo, 2013, Snyman, 2012). However, those involved are attracted to biotechnology and other life sciences (Chakma *et al.,* 2013). Healthcare infrastructure projects are often ambitious projects in need of substantial investments, a departure from the common form of venture capital in Africa - which is largely donations from friends and family (Snyman, 2012). However, venture capital needs to be backed up with other conditions, such as improving the ease of doing business in a country (Goedhuys and Sleuwaegen, 2010, Bengtsson and Sensoy, 2011).

2.4.5.5 Individual investors

Local entrepreneurs, at times partnering with foreign individual investors, are a growing source of funding for healthcare in Africa. A large number come from the 'returnee group' - who have returned to Africa having been abroad for some years; while others are investing back 'home' as migrants in more developed countries (Sy and AGI, 2014). These infrastructural investments include setting up clinics, nursing homes, medical centres or diagnostic facilities. Some are also family-owned business establishments, being started as entrepreneurial activities by the individual doctors and healthcare specialists. This growing trend as the Africa Growth Initiative (AGI) suggests, needs to be captured through infrastructure investment bonds, or diaspora bonds targeted at developing certain sectors such as the healthcare sector.

2.4.5.6 Capital markets

Recent experience shows there is strong appetite for Africa's improved sovereign risk in the global capital markets (Azulle and Hundal, 2013). Since most African countries' credit profile has improved on the back of consistently high GDP growth rates, this is not surprising. Notable transactions include Zambia's dollar bond that was upsized from the initial target size of $500 million to $750 million and was hugely oversubscribed. International capital markets represent the largest pool of funds. However, international investors typically lend in US Dollars (USD) or Euros (EUR) which creates significant currency risk for the issuing country.

Mobilisation of domestic capital could help mitigate currency risk and, with local investors having a better understanding of operational and political risks, domestic capital could be an important source of funding for infrastructure in general, and healthcare in particular (Gaag and Stimac, 2012). In countries with better financial deepening such as South Africa, and other emerging economies such as Latin America and in Asia (Azulle and Hundal, 2013), this has become a significant source of capital as banks and institutional investors such as pension funds and insurance companies start to play a more significant role.

In essence infrastructure projects need longer dated financing which is most suitable for institutional investors; but in many countries this section of the market is still very much in its infancy.

2.4.5.7 External commercial borrowings

This source of funding involves interactions of parties with the central bank. The external commercial borrowings mode of financing has been used only in a limited number of projects. In India, for example, selected entities in the services sector, which include hotels, hospitals and software sector, are allowed to avail external commercial borrowing (ECB) up to 100 million USD per financial year for import of capital goods (PWC, 2013). The major advantage of following this route is the lower interest rates in the United States and European markets compared to the emerging economy countries even though this extension may not be applicable to Africa. If this factor applies to Africa it is a much bigger source of credit due to lower interest rates.

2.5 Structuring finance for infrastructure

There are various ways of channelling funds from different sources to match cash flow inputs and risk in infrastructure financing. This section provides an overview of what other sectors have used, and public-private partnerships in particular standout for healthcare. This section borrows from various infrastructure financing arrangements and also from how healthcare finance has been structured elsewhere in the world.

2.5.1 Public-private partnerships for healthcare infrastructure

A public-private partnership (PPP) is an approach that combines efforts of public, private and development organisations in solving a public sector challenge; in this case healthcare infrastructure (McKee *et al.,* 2006). From the aforementioned analysis, it is clear that healthcare financing in Africa is mainly provided by the public sector and donors, even though private investors are starting to demonstrate a growing appetite.

Some finance scholars provide an analysis of merits and demerits of this form of financing. In the United Kingdom (UK), a country considered one of the most advanced in terms of using this form of financing arrangements (Akintoye and Chinyio, 2005, Vecchi *et al*., 2013, Hellowell and Pollock, 2009, Hellowell, 2013), this analysis is used as a benchmark for PPP success and failures in healthcare. Politically, this shifts responsibilities for providing public services from a central and public control to private sector companies as a means to improve efficiency. Recall the evidence that Africa is losing about $17 billion per year to inefficiency in the public sector infrastructure , and that illicit capital outflows drain economies (Diagnostic *et al.,* 2010, Mbeki, 2015). Added to the newly released report on leakages and money laundering through Africa's illicit outflows of up to $60 billion, there is clearly a need for Africa to improve efficiency in both collecting revenue and allocating it to infrastructure

There are other stated potential conflicts of this finance structuring. Cavallo and Daude (2011) state that public investment raises the marginal productivity of private capital, leading to potential crowding out of private investments. In contrast, weak institutions and restricted access to financing could diminish the positive effects of public investment projects and crowd-out private investment (Cavallo and Daude, 2011). However, the authors conclude that strengthening the capacity of governments involved in PPPs is a way of overcoming this

conflict, as the marginal productivity of public investment is conceivably higher when government's capacity is strengthened (Cavallo and Daude, 2011).

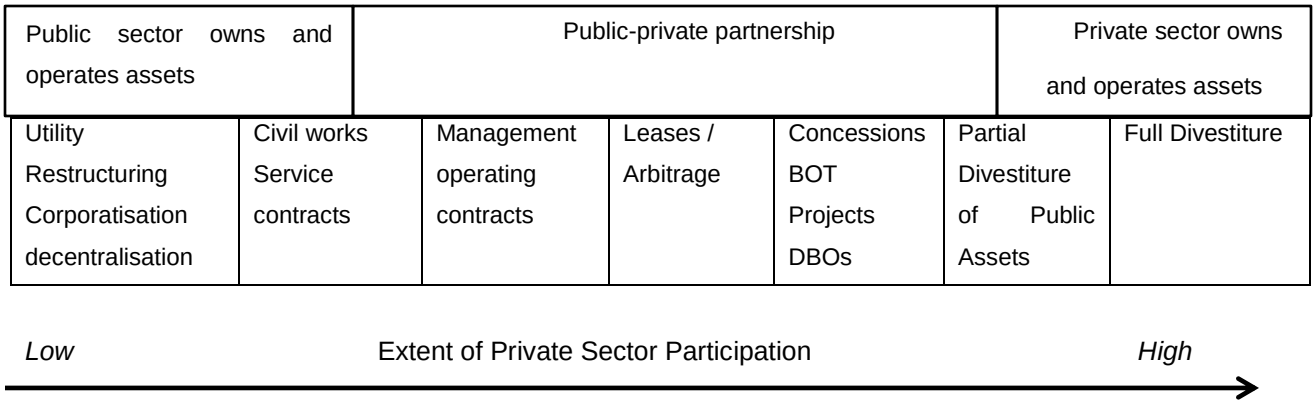


Figure 3 : *Structuring finance in PPPs. Adapted from Cavallo and Daude (2011)*

In the healthcare sector, just like in financing other infrastructure arrangements, PPPs can be structured in the build-operate-transfer (BOT) or build-own-operate-transfer (BOOT) form (Iossa and Martimort, 2014) that are commonly used in the energy and the water sector. South Africa has seen both forms of arrangements at work (Loxley, 2013). The PPPs can also be viewed as segments of the syndicated loans market. This market today plays a fundamental role in supporting infrastructure financing. The equity portion, for a very long time, was provided by industrial developers and before the mid-2000s institutional investors were almost inexistent (Iossa and Martimort, 2014).

PPs models used by various state governments are increasingly becoming a combination of the best from each of the above basic types, depending on the needs of the target service delivery and population (Iossa and Martimort, 2014). The phenomenon is evolving globally with some notable trends articulated in literature on healthcare PPPs

1. From the few case studies on healthcare (largely in South Africa and Lesotho), the measurements of success in PPPs are evolving toward health outcomes and performance. However borrowing from PPPs in infrastructure in general demonstrates these are now more focused on better procurement and value for money (IFC, 2011, Loxley, 2013).

2. The major advantages of PPP arrangements are the platforms they create for having broader conversations about sustainability in healthcare. As such, the model evolves by ensuring that the private sector is not only there for the short term, by building in market related profit margins. By introducing competition later on in the contract the government repayments go down, to generate efficiency and better quality at a reduced price (Olivier and Wodon, 2012).
3. There is devolution of power in executing PPP deals, where local governments sign on rather than the national governments. The role of national governments has shifted to policy-maker rather than implementer (Mudyarabikwa and Regmi, 2014).
4. High economic value medical equipment is now often included in the PPP deal, enabling medical equipment companies to be risk partners themselves in the consortiums (Ricks *et al.,* 2013). They could also include their own deal arrangements such as pay per use, build-operate-transfer or even profit sharing models.
5. The fundamental benefit for Africa is that by increasing quality and efficiency, the few PPPs have challenged the notion that quality healthcare is for the rich, and improving the risk pooling mechanisms for low cost medical insurance has ensured that the poor can access private healthcare. This is crucial for Africa as it can reduce the inequalities seen in healthcare (Estache and Wodon, 2014).

PPPs in Africa, though uncommon in funding healthcare infrastructure, are set to grow (Loxley, 2013). Though PPPs are characterised by the sharing of investment, risk, responsibility and rewards between the partners, the government remains overall responsible and accountable for delivering services that protect and promote public interest (IFC, 2011). Accordingly, reviews that demonstrate that the benefits for the private sector partner are often in excess of market related rates have spurred many governments in Africa to analyse carefully this form of financing (Froud, 2003). South Africa, for example, has called a moratorium on the traditional PPP model, and has called for risk equalisation measures and increased competition from the start (Kula and Fryatt, 2013).

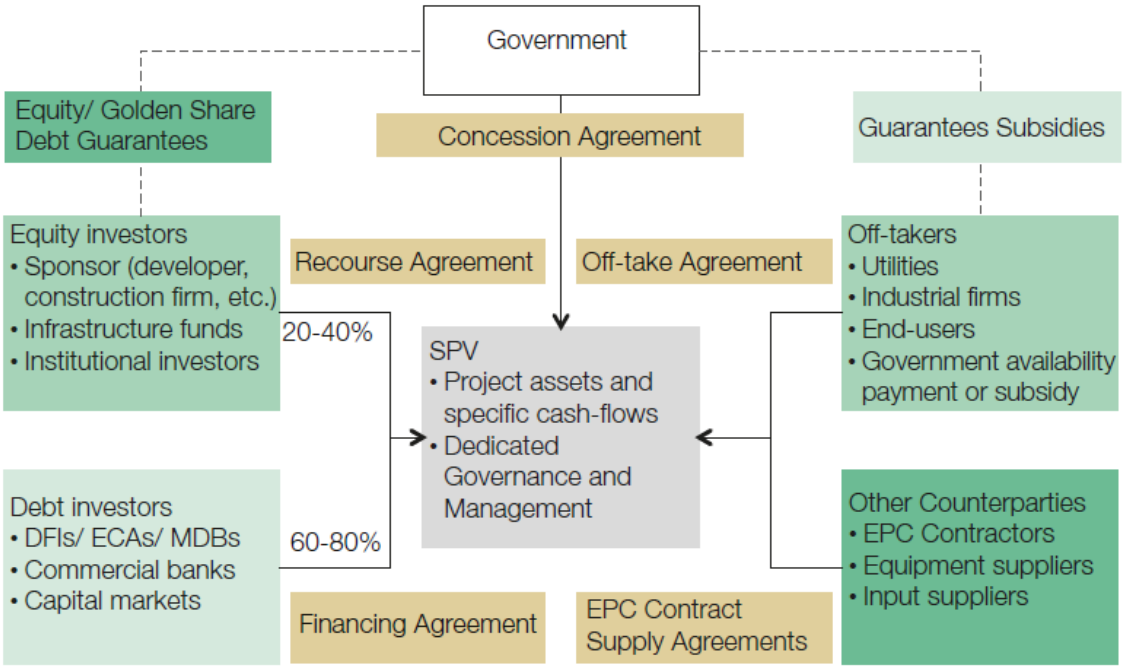


Figure 4: *A model of public-private partnership common in Africa (Source: Lion'sHead, 2013)*

2.5.2 Infrastructure bonds

A traditional financing vehicle for infrastructure construction and maintenance projects is private bond financing. Joining the bandwagon of literature on Africa's infrastructure bonds, Azulle and Hundal (2013) provide an analysis on why even though African countries are currently able to borrow cheaply on sovereign debt markets, their new bonds are not highly-rated by the agencies. The success of bonds lies in the rating by bond agencies. As such, the lack of a track record of good public service debt becomes a factor in investing in bonds. Given also that infrastructure projects cannot get ratings that are above a country's rating, it is possible that financing agencies are erroneously giving legal force to the ratings (Azulle and Hundal, 2013).This affects infrastructure bonds as a way of financing infrastructure.

Other types of bonds include municipal bonds. In developed economies, a local government can issue tax-exempt private activity bonds to private investors to raise capital (Leigland and Thomas, 1999). In this case the local governments slowly pay back the bondholders with proceeds generated by the projects. The bonds are attractive to private

investors because there is low risk that the borrowing government will be unable to pay off the bonds with revenues from ratepayers and taxes (Azulle and Hundal, 2013).

Various features determine the feasibility and suitability of such bonds. According to Azulle and Hundal (2013), liquidity is a key factor and a few countries are liquid enough to sustain the bond market. South Africa stands out in the region in terms of local market liquidity, capital market development and experience with project finance. Outside South Africa, markets such as Kenya, Nigeria, Namibia and Botswana have significant liquidity relative to GDP but less project finance and bond market activity (Azulle and Hundal,2013).

Another mechanism is structuring migrant remittances towards specific infrastructure sectors. For example by issuing diaspora bonds, or securitising future remittances and other future receivables, Africa could have a large source of financing for specific infrastructure projects (Meaney and Hope, 2013). Critics of this type of financing point to its complex financial structuring, often resulting in high upfront investment costs, which is worrisome (Longinidis and Georgiadis, 2014).

There is evidence that Africa is partaking in the infrastructure bond market (Sy and AGI, 2014, Stewart and Yermo, 2012a). However, as illustrated earlier in this paper, in the case of Ghana, some of the bonds were not fully subscribed. Since the project procurer utilises a financial institution, this type of financing grows with the increased creditworthiness of investment banks needed to underwrite bonds. In an infrastructure review such bonds are targeted at institutional investors, but for emerging markets, some have been syndicated with banks from developed markets (Inderst, 2010). Once construction has been completed and the infrastructure asset becomes operational, long-term bonds may replace the bank loans and short-term bonds from the early stages of the project.

2.5.3 Demand financing

An even more challenging dilemma for healthcare infrastructure is how to efficiently fund the operating costs in healthcare (AU, 2001). Universal coverage for health is a goal that most African governments have subscribed to, and this for many is equivalent to healthcare insurance that works for the bottom of the pyramid (Suraratdecha, Saithanu *et al.* 2005). While this approach has worked in some countries, others have criticised the presence of health

insurance as a cost driver for healthcare, explaining why medical inflation is higher than nominal inflation (Lagomarsino *et al*., 2012, Gaag and Stimac, 2012, Spaan *et al*., 2012).

Given the inefficient revenue collection mechanisms in most African countries, some authors bemoan this approach to universal coverage as a potential breeding ground for inefficiency in healthcare (Mills, Ataguba *et al.* 2011). To what extent is this true? According to the WHO, in approximately half of Africa's countries, 40% or more of the total health expenditure comes from household out of-pocket payments, which is the most regressive way of funding healthcare and is a major barrier to access (WHO, 2013). Further, empirical evidence on the determinants of aggregate healthcare expenditure reveals that institutional factors of the health systems, largely based on the relationship between the healthcare providers and the payers, influences healthcare expenditures (Tulchinsky and Varavikova, 2014, Poullier, 2002).

It has long been established that the profitability of, and value from, healthcare ventures depends on the willingness and ability of the target market to pay (Gerdtham *et al*., 1992, Porter, 2010, Christensen, 2013). This area has attracted interest not only in Africa but globally and cannot be divorced from the discussion on funding healthcare infrastructure (Henke and Martin, 2009, Mills and Hsu, 2014, Porter, 2010, Sachs, 2002a, Smith and Normand, 2009, Suhrcke *et al*., 2006, WHO, 2013).

Some authors assert that skewed financial flows between capitation and operational costs exacerbate inefficiencies and inequities and that they need to be bundled (Smith and Normand 2009). Indeed, in some countries there is a division of flows between capital and operating costs which calls into question what the best model for funding healthcare should be (Krůtilová and Yaya 2012; Lagomarsino, Garabrant *et al.* 2012).

It is crucial therefore to have an informed analysis on the linkage between capitation and operating costs for most of the African markets, as a deciding factor for investment decisions on infrastructure. This is beyond the scope of this research. .At the heart of these debates within the healthcare markets, both for private and public sectors, is the need for creativity and innovation around the subject, and perspectives from the stakeholders will provide insight into what the future models for healthcare should encompass.

2.5.4 Creative financial structuring

These creative financial structures including International Financing Facility for Immunization, would help front-load aid commitments, although these may not result in additional financing in the long run. Creatively structuring debt is another source of cash flow, for example the current discussion on debt relief for Ebola countries should spur a new wave of economic development, and caution needs to be exercised when resorting to market-based borrowing.

2.5.5 Equity issues

Direct equity investment refers to investments made directly in unlisted infrastructure assets without the need to utilise a fund manager for the investment process (Macquarie, 2009, Longinidis and Georgiadis, 2014). When a company has the in-house resources and capability to source assets, finance the investments, and manage/maintain them this could be an attractive way to finance infrastructure deals. Increasingly as indicated in infrastructure reports, such investments in Africa have been made through private equity funds (Inderst, 2010). However the extent to which this has been successful in healthcare investments in Africa has not been reviewed at length.

2.5.6 Sale and lease back and conversion of public assets for private sector use

There are various assets on government's balance sheet that may be creatively used for financing infrastructure. For many African cities, the growth in urban populations has meant that land value has dramatically gone up. In Africa, as in other parts of the world such as in India, Peterson (2013) states that much of the land owned by government in the urban centres lies idle, such that a composite public-sector balance sheet normally would demonstrate an asset mix strong on public-sector landholdings but weak on infrastructure.

The question arises as to whether some of these sites could be used for healthcare infrastructure, and it would be ideal to sell off the land or exchange it for infrastructure. This however has to be done in a manner that is politically acceptable and economically efficient (Peterson, 2013). Some authors question whether public land sales are at all a realistic source of finance (Longinidis and Georgiadis, 2014). However, more studies are needed to answer this question. The suitability of this financing structure for healthcare has not been investigated

and raises questions on sovereign ownership of natural resources including land that is always a contentious issue in Africa.(Gelb *et al.,* 2014)

2.5.7 Other structuring mechanisms

There are other structuring mechanisms enlisted elsewhere but their utility in Africa has not been tested, l*et al*one in healthcare infrastructure. These are suggested ways to scale up mainly PPP arrangements and include complete ownership of the project, operator finance , management operating contracts and long term concessions often deployed in large scale infrastructure projects (Acerete *et al.,* 2012, Kula and Fryatt, 2013). Other arrangements such as syndicated loans and debt securitisation need a certain level of financial deepening, and may not necessarily be applicable to Africa's healthcare infrastructure (Della Croce and Gatti, 2014, Ehlers, 2014).

In conclusion this overview of how to structure finance is useful in revealing possible modes of structuring healthcare finance. The gap seen in literature largely includes the deficit of applying these models to healthcare; and their very suitability to Africa. With certain scholars maintaining that specific conditions need to be met to finance infrastructure in Africa; the sector's investability needs analysis and accordingly we examine the factors that affect healthcare infrastructure's investability in Africa.

2.6 Factors affecting investability of the healthcare sector: A review of enablers and barriers

Some researchers provide an analysis of the various factors that affect investability of a sector, divided into enablers and barriers. However few articles relate this to healthcare. Existing scholarly work narrates the role that country-level business and cultural climate play in new venture creation – what is needed is to translate these framework conditions into a format that policy makers can also relate to (Couyoumdjian, 2012, Goedhuys and Sleuwaegen, 2010, Harper, 2013).

Della Croce and Gatti (2014) indicate that conditions for private sector involvement are also underpinned by global economic conditions. Factors such as liquidity in global capital markets affect infrastructure spending. However a contrarian view emerges after further analysis on capital flows – where large sums of money were directed to other emerging economies but not to Africa where return required for private investment infrastructure is very high (Demirag *et al.*, 2011, Vecchi *et al.,* 2013). These dichotomies reveal that other factors and not only the availability of capital affect Africa's healthcare infrastructure's investability.

2.6.1 Enablers to investability of healthcare

Joining the wagon of scholarship on factors affecting investability are narratives that correlate this conducive entrepreneurial business climate with an increase funding sources (Thai and Turkina, 2014). Furthermore, an analysis of the regulatory, normative, and cognitive dimensions of entrepreneurial activity as asserted by Bruton *et. al.* (2010), adds to this work albeit in mainstream entrepreneurship that may or may not exclude healthcare infrastructure development. However, for Africa, the Gates Foundation, and the IFC have led a discussion on the investability of healthcare as a sector which many scholars had neglected, and offer opportunities for investing in the sector as a guide to would be entrepreneurs (Stallworthy *et al.*, 2014).

The major investability factor is that there are returns to be made from the sector, especially in Africa given its phenomenal economic growth. Borrowing from the earlier argument on sequencing healthcare growth, healthcare as a sector would benefit from the GDP growth fortunes being experienced by many countries. The expected social return on

investment makes it easier for governments to identify and hopefully provide a role as either a catalytic investor, or as a guarantor for any investments made in the sector. This lowers the risk profile of this asset class,

Borrowing from work and literature on infrastructure investments in general, we turn to the discussion on enablers and barriers to investing in healthcare as a sector.

2.6.2 Barriers to healthcare's investability

Financiers seek out attractive opportunities to finance investment and this begs the question why this has not happened in healthcare? Scholarship on the question provides some barriers articulated by both economists and leading healthcare practitioners alike, borrowing from literature on financing Africa's infrastructure (Ayyagari *et al*., 2013, Sambo *et al*., 2011, Shaoul, 2005, Weber and Alfen, 2010). For healthcare, there is the compelling response on the overall social return on such investments being seen to be too low to warrant private investment (Carrier *et al.,* 2012). If this was true, contrary to the argument given above on enablers of financing healthcare, the shortfall of social returns below private required rates of return may also result from private costs of capital being greater than their social equivalents, i.e. the costs at which society as a whole, as against particular private sector investors, would be willing to invest (Carrier *et al.*, 2012). This analysis is provided under the risk and return section of the review below.

2.6.2.1 Policy and regulatory issues

Health is a highly regulated sector in many countries. There are a variety of regulatory issues ranging from regulating the nature of healthcare delivery – for example restrictions on who owns a pharmacy or a hospital and restrictions on public-private partnerships in healthcare (Montagu and Harding, 2012). Regulatory barriers could be perceived as a negative for investors as they could increase the cost of capital, as observed by Montagu and Harding (2012). Other scholars see this as a case of glass half full or half empty in that the challenges that come with regulation mean that the barriers to entry are high, and once one is invested the returns are likely to be higher because of these same barriers, (Kumar *et al.,* 2011). However the extent to which the regulatory barriers affect availability of funding for healthcare needs to be studied further, perhaps in an econometric model

2.6.2.2 Deal making details

The willingness to engage in the healthcare sector is dependent on the factors around doing business in Africa and the investability of the sector as a whole. Healthcare is a highly regulated industry, and as such, predictability and clarity of the regulations is a forerunner to improving the sector's investability (Gatti, 2013). This ultimately affects who is allowed or not to play in the sector, wherein the government and subsidiary regulatory bodies set and monitor the regulatory framework. As alluded to by Gatti (2013) increasingly, knowledge of; transparency thereof; and predictability of the policy frameworks are an enabler of a sector's investability. As such it could be assumed that this would be the case with the healthcare sector. Where rules are unclear, it becomes difficult for financiers to manage their risk.

Factors that enable ease of doing business have improved somewhat in Africa, despite a good deal still needing to be done. Some authors analyse factors that contribute to a country's investability by including housekeeping issues such as registering a business, obtaining credit, and energy reliability, and how these affect the outlook from an investor angle, and as such can be difficult for financiers to manage (Bengtsson and Sensoy, 2011, Ladekarl and Zervos, 2004, Thai and Turkina, 2014). However these are the same infrastructural needs that could spur more development, and a shift from regarding governments as the sole player in the infrastructure space, has resulted in financiers expecting high returns trailblazing in environments where risk is perceived to be high (Business, 2013).

Indeed, scholars looking at returns in the healthcare sector have demonstrated thehigh returns yielded and the tendency to be recession proof (Dong and Guo, 2013). Whether this applies to the actual healthcare infrastructure has not been researched but most of the healthcare deals when structured properly do yield healthy returns. The traditional Modigliani theory of finance of high risk high returns applies, but any savvy financier needs to be backed by innovative entrepreneurs to create a healthy deal flow (Terris and Myer, 1998). The latter can only arise when a country has an enabling environment for entrepreneurship.

2.6.2.3 Inefficient healthcare business models

The healthcare business models have come under scrutiny in the last two decades, with many scholars providing analysis on why it is possible to have a system that can be run at

lower costs (Christensen *et al*., 2000, Berwick *et al*., 2008, Dixon-Woods *et al*., 2011). In particular, driving the innovative disruption agenda, Christenson (2013) illustrates what the cheaper and better models could be, and even though these are largely for the American healthcare system, they are applicable to the health systems in Africa. Reference is made that the built infrastructure of hospitals tends to be incongruent with the operating models (Christensen, 2013). In his book on the Innovator's Dilemma, Christensen suggests that more deregulation is needed in the sector and that non-traditional healthcare players, including those involved in gaming, should come on board (Christensen *et al.,* 2009). This would enable more efficient use of resources, and would attract cheaper sources of capital. As alluded to before in this text, some hospitals are seen as behemoth facilities with low asset utilisation efficiency. Investors are weary of investing in assets that will not generate long term value, and healthcare business models are seen to be too inefficient and not delivering value for investors, public and private alike.

2.6.2.4 Demand financing

One of the major hurdles in ensuring flow of funds to healthcare's infrastructure needs is the limited demand financing seen in most countries where barely 10% of the population is insured. Without pooling of risk in services offering in healthcare, it is difficult for a private venture to offer services that are able to attract the clientele that can pay for the high quality high value services with better profit margins. Consequently such a facility may not then attract the funding required.

This discussion therefore affirms the argument by many authors on the continuum of healthcare funding that capital costs for healthcare cannot be divorced from the operating costs (Lagomarsino *et al*., 2012, Gaag and Stimac, 2012, Spaan *et al*., 2012).

2.6.2.5 Risk and return in healthcare infrastructure

In an efficient market, according to corporate finance theory, information about the level of risk associated with infrastructure as an asset class results in a rapid adjustment in the risk premium and thence the expected return (Ross, 1976). This economic reasoning should apply to investing in healthcare infrastructure (Newell and Wen, 2006). Expected cash-flows generated by the project should remunerate both the equity and debt holders (Hellowell, 2013).

The risk in financing healthcare is also linked to the method of financing used by investors. For example, in a PPP, increasingly still in Africa, financiers depend on the insurance when valuing risk, while some of the projects are still not insured (Demirag, Khadaroo *et al.* 2011). As Demirang *et al*. (2011) articulate,: this also applies if the funding route is through bonds where there is currency risk.

Market risk is a factor in healthcare infrastructure projects, with information asymmetry being a risk factor applicable to most projects (Cruz and Marques, 2013). As the authors point out, the ability and willingness to pay for healthcare projects is particularly low. While private finance is beginning to commit more resources to building a knowledge base on Africa's healthcare infrastructure, this usually remains rudimentary in comparison with expertise on other regions (El Ghoul *et al.,* 2013). As such information costs remain high, this increases the cost of capital (Gaag and Stimac, 2012). Some solutions have been suggested to counter the information asymmetry problem - standardisation, insurance and bundling. Most obviously, purchasers need a single effort to understand a whole class of projects and so the cost can be spread over the class rather than be project-specific (Newell and Wen, 2006, Collier, 2014).

For healthcare infrastructure market risk also arises from the uncertainty of the cash flows and the lack of knowledge on the ability to pay for the services offered (Ng and Loosemore, 2007). This uncertainty partly arises from the debated lack of value seen in healthcare, the history of low correlation between healthcare services delivered and the amount of money paid for these services (Porter, 2010). This market risk substantially increases the difficulty of structuring such projects to achieve investment-grade debt ratings (Newell and Wen, 2006). Some authors suggest that if healthcare projects could enter into arrangements that are similar to long-term power purchase agreements used in the energy sector; this will mitigate price and volume risk (Collier, 2014). As such pay per use, build operate and transfer models have become popular in the healthcare infrastructure space. This, together with an inelastic demand for healthcare, can provide the functional equivalent of a long-term contract.

Another risk related to the lack of information on the ability to pay is the perceived low price points for future operations in healthcare, given that this is a social sector (Porter, 2010). On the contrary however, this may not be the case, as some authors note, and there are returns to be made if the structure of the deal is optimal (Newell and Wen, 2006). Newell and Wen (2006) further indicate, as they compare to other non-traditional real estate assets, that investment in

the healthcare infrastructure should be for the long run, and not just investment in brick and mortar. As Sambo *et al.* (2011) note, and recently Fauci (2014) asserts - it is difficult if not impossible for Africa to develop if there is no long-term investment in healthcare infrastructure, when existing health systems are so weak.

One issue raised by scholars is that healthcare firms, or entrepreneurs working in the sector, because of the high capex requirements, tend to be highly leveraged. This means the structure of the firm finance comprises mainly of debt (Ratha *et al.,* 2008). If there is debt, usually this is high interest rates debt. In theory the Modigliani−Miller theorem confirms that investors should not care about the composition of firm finance. However, because the interests rates that most hospitals obtain finance on are typically high refinancing becomes an issue. This could be a potential barrier in refinancing healthcare infrastructure. A KPMG study revealed that most SPVs are unwilling to accept refinancing risk, and this is borne by the public sector, creating significant budgetary uncertainty since if a replacement loan is more expensive than the original loan, this increases the unitary charge (KPMG, 2009).

Risk and return are at the centre of investability of a sector, but these factors need to be explored further in Africa's healthcare environment.

2.6.2.6 The healthcare infrastructure's disadvantage as an asset class

Another barrier is the real estate value of hospitals mentioned prior. In 1993 Nourse and Roulac listed possible interventions on how real estate could be linked to corporate business processes (Nourse and Roulac, 1993). Since then, many scholars have contributed to this topic, but very few have facilitated the role of hospital infrastructure in creating firm value per se. nevertheless, by extension , it can be reasonably assumed that there is value in investing in healthcare infrastructure (Price and May, 2008).

The rating of healthcare infrastructure is another issue as healthcare infrastructure needs specific expertise for maintenance once it has been built. African infrastructure projects are far below the A rating threshold that is required to access funding from some sources, especially pension funds in the OECD (Collier, 2014). Some authors suggest that the move to risk-weighting of capital ratios further disadvantages African infrastructure projects in general since many of them are perceived as high-risk (Chaudhuri and Mukhopadhyay, 2014, Collier, 2014). Suggestions to counter this challenge is bundling these projects, and in hospital infrastructure

this could mean the hub, satellite and spoke model bundling of the heath care infrastructure projects.

A summary of research, provided in Table 1, looks at investability of healthcare as an asset class, the good and the bad (WHO, 2013, Mills *et al*., 2011, Sambo *et al*., 2011, Mpofu and Nyahoda, 2008, Heever, 1997, Gatti, 2013) .

Table 1: Merits and demerits of healthcare infrastructure as an asset class

Advantages	Disadvantages
• Provision of key public services guarantees demand (WHO,2013; Sambo *et al.*,2011; Mills *et al.*, 2011), • High entry barriers protects investors (Mills *et al.*, 2011), • Frequent natural hedge against inflation (Gatti, 2013), • Stable predictable operating cash flows (Gatti, 2013).	• Long term asset with long economic life this means healthcare is generally long lived and typically involve significant technical, legal, political and economic risks, long payback periods, high gearing and negative returns in early years (Gatti, 2013; Mpofu and Nyahoda, 2008), • Strongly inelastic demand, (Heever, 1997), • Regulated assets(Mills *et al.,* 2012; Heever 1997), • Natural monopoly or equal monopoly market contexts. Public health authorities sometimes introduce excessive competition, regulation and control which can stifle innovation (Gatti, 2013), • Low correlation with traditional asset class and overall macroeconomic performance (Heever, 1997).

These considerations are further deliberated below.

2.6.2.7 Credit constraints in Africa

In this model, credit rationing will be an increasing function of the riskiness of the underlying environment and of the severity of barriers to the dissemination of information. Moral hazard and adverse selection cannot arise in a world where all projects are the same, but the more

costly it is to sort projects (the greater the informational asymmetries), the more serious are adverse−selection and moral−hazard problems. Many present−day developing countries fit these conditions: they are subject to terms of trade shocks and lack effective regulation requiring financial disclosure.

2.6.2.8 Information asymmetry within healthcare

With lack of information as Business (2014) observes, and building on the work of Laderkal and Zervos (2004) on housekeeping issues on investability , information availability is key to a country's investability (Ladekarl and Zervos, 2004). The question then is on which patterns of finance should be observed when information is asymmetric and adverse selection and moral hazard arise. The result of information asymmetry is credit constraints because an entrepreneur, who knows the probability of failure while external investors do not, is willing to pay more for external funds. This set up gives rise to adverse selection where entrepreneurs with safer projects drop out of the pool of potential borrowers as they are not willing to pay more for capital. In an analysis by Bhattacharya and Londhe (2014) such selection is prevalent in Africa, and results in higher interest rates. Thus lenders inadvertently encourage borrowers to undertake risky investments and by so doing reduce their expected return as interest rates rise (Bhattacharya and Londhe, 2014). The result is credit rationing amidst high interest rates. This has been the challenge with healthcare projects in Africa where more share capital will have to be subscribed by the promoters before external finance can be obtained.

2.7 Conclusion of the literature review

Literature is awash with analysis on infrastructure deficits and financing models in Africa. The majority of this literature dwells on hard infrastructure such as roads, energy and water. Development finance institutions for example classify healthcare and education as soft infrastructure. This classification is erroneous according to the proponents of healthcare who see it as a necessary condition for economic development. As such, this literature review analysed the trends that have happened in financing infrastructure in Africa, the sources of financing and the barriers and enablers of investing in the healthcare sector. The review distinguished between capital financing and operational financing, which are key debates in healthcare management.

Literature in particular dwells mainly on financing operating costs. However the same sources of financing infrastructure such as development finance institutions, capital markets, government funding, individual investors, private equity and donor agencies are relevant in financing healthcare, with nuances. The role of government is looked at closely given that healthcare is a social good. However this role of government is evolving from being the sole provider of financing public healthcare; to guaranteeing public health infrastructure projects, to the overall regulatory role that veers a country into financial deepening.

Models of financing healthcare such as build-own-transfer and leasing operating models are explored as alternatives, with many authors dwelling on the merits and demerits of each financing system. An umbrella modus operandi is the public-private partnership model that enables the two major sources of financing, government and private sector, to come together in exploring a more efficient form of financing. It is clear that the use of private finance may allow healthcare systems that are constrained by an absence of public capital to undertake investments that would otherwise never materialise, or materialise only with a substantial delay. In addition, involving private finance in capital projects may offer efficiency benefits – for example, in construction and operations – that may sometimes offset the higher financial cost of this form of financing.

The literature review explores barriers to investing in healthcare. Some of the major hurdles are the variables within healthcare as an asset class. The real-estate value is erroneously valued and at times not clear on what role it gives to the strategy of a firm, the highly geared healthcare infrastructure industry; the information asymmetry and agency factors that arise, not

just from the healthcare sector but from infrastructure projects in Africa. However, not all is bad, as healthcare is a recession-proof industry in general and investing in its infrastructure usually is good for diversification.

Various models for financing infrastructure exist in the literature, but are scattered across industries. As such the structural framework for these models explored from literature, provide detailed information on what these financing models are (or could be); their relevance – first in Africa's infrastructure in general and secondly in the healthcare sector in particular. It was the author's intention to extend the analysis across various countries in Africa and industries – to capture the diverse perspectives. Indeed a thorough consideration of a broad spectrum of literature covering several models, case studies, several industries and several countries was reviewed in the literature, and as such the sample involved stakeholders from several countries. This helped obtain a wide range of research questions that were directed to the various stakeholders highlighted above.

The literature review concludes that an expanded approach to healthcare financing should be multi-pronged, involving governments leading the effort to explore complementary financing mechanisms; using private sector resources more equitably and efficiently; and increasing collaboration with donor partners to ensure external and domestic resources help build the health system in general. The role of finance however is clear, that unless financiers realise the importance of this asset class, and have intentions of growing the sector, the healthcare sector will remain dwarfed as a soft industry, with the archaic infrastructure in healthcare continuing to hinder economic development.

3 DATA AND METHODOLOGY

"As bankers, you are probably most interested in the numbers. Government has identified potential projects worth about R3.2 trillion between now and 2020. Over half of these projects, about R1.9 trillion worth, are in electricity, transport, education and health."

Nhlanhla Nene, South Africa's Minister of Finance speaking at the banking summit in Johannesburg, August 2012

A research design defines the extent to which the research questions have been crystallized from being exploratory to a more formal one (Leedy and Ormrod, 2010). Given an outline of the methodological framework, this section details the appropriate research design essentials. It begins with an overview of the principle of a qualitative methodology followed by an analysis of the advantages and disadvantages of this design.

Qualitative research studies typically help to reveal the nature of situations, especially complex situations and can be used to test validity of certain assumptions (Leedy and Ormrod, 2010:136). This complexity is because of limited empirical evidence on sustainability issues within healthcare, coupled with the varied initiatives that are being employed and the varied nature of the applicability of enablers and barriers that was seen in literature. To navigate through such subjects, this research required articulation of individual experiences and perceptions and thus deployed a qualitative research methodology (Leedy and Ormrod, 2010: 147).

Recall that the purpose of the study is to investigate the perspectives of financiers on the investability of the healthcare sector in Africa so as to partly determine where the healthcare sector could be in the next decade. Challenged by the issues of equity and access in healthcare provisioning, these perspectives would guide major players in creating an enabling environment for financing that would allow growth in the sector. As a result of the purpose being one of gauging perception, the technique of survey research is considered best suited to this study and is accordingly used. The research therefore followed phenomenological perspective but employed survey type questions and in-depth interviews for data verification and more in-depth exploration.

Survey research is the most commonly used method for descriptive research. Hofstee (2010: 122) observes that "*surveys can be an excellent way of finding out people's opinions, desires and attitudes".* It is the objective of this study to understand opinions on financing healthcare in Africa. Given that the research problem has not been studied before and that the legislation is new, primary data in the form of a survey is considered to be best suited to this study. This survey research is based on specific questions, identified through the literature research, within a structured questionnaire which was made available for online completion. A link to the online questionnaire is sent out by email to a specified sample of 'informed individuals' (Diamantopoulos and Schlegelmilch, 2005).

In-depth interviews also follow standard theoretical frameworks from a survey approach from a literature review, which was the case in this study, and utilises open ended questions to get clarification or to allow the researcher to probe the reasoning further (Leedy and Ormrod, 2010: 188). As stated by Leedy and Ormrod (2010), such a design allows a researcher to identify a problem, analyse and interpret the data for findings *and* thus assisting in answering the research question.

3.1 Population and sample

This section explains the population, sample and sampling method used in this research.

3.1.1 Population

The population targeted in the research comprised financiers of infrastructure both in the public and private sector, who had previously financed, or are considering financing, healthcare infrastructure as part of their institution's strategy and /or objective.

3.1.2 Sampling method

Convenient sampling was employed for simplicity purposes and cost constraints. This technique, as articulated by Leedy and Ormrod (2010:147), is appropriate when there is true difficulty in obtaining true probability and in this case obtaining true probability. A total of 43 financiers were interviewed and this number was able to supply varied and detailed accounts for the purposes of this study. The sample comprised a wide range of financiers representing South Africa, Zambia, Nigeria, Kenya , Lesotho, Zimbabwe, Egypt, Nigeria, Ghana, Swaziland, Morocco, Democratic Republic of Congo, Angola, Malawi and Mozambique A total of 23/43 of the respondents were based in South Africa , but the majority of these (14/23) focussed on investments in the rest of the continent, only using South Africa as a base. These included a sample comprising individuals focussing on financing in Africa but not focussing on the unique issues in their own countries such as a representative from AFDB (Tunisia) and donor agencies (New York, Netherlands, Brussels and Washington DC). In addition there were in-depth interviews with six financiers attending the financing healthcare in Africa sessions at the World Economic Forum in DOHA in 2015.

As per initial plan, the sample was a convenience one, where necessary referrals to executives or senior managers in charge of financing healthcare were obtained from their

counterparts, although this could not be classified as a snowball approach to sampling (Biernacki and Waldorf, 1981).

3.1.3 Sample size calculation

According to Patton (2002), there are no rules for sample size in qualitative research but data is guided by saturation. The researcher targeted 60 institutions initially and sought to conduct surveys whilst analysing the data until saturation. The response rate out of 100 survey questionnaires sent was 43% which is a good rate from this particular audience.

The study utilised both qualitative and quantitative methods to arrive at some conclusion on what are the relevant and /or efficient financing models for emerging markets' healthcare delivery systems; and an analysis of what perspectives exist from various stakeholders on optimal models of financing healthcare – both infrastructure and operating costs.

3.1.4 Data analysis

The questionnaire uses a 5 point Likert type scale in order to measure the opinions of the sample group. The 5 point Likert scale allows respondents to indicate their perception of the importance of a test statement as follows: Very important; Slightly important; Neutral; Not important and Irrelevant.

As this is a descriptive survey, reliance is based on summary statistics that include frequency distributions and data visualisation methods such as bar charts and pie charts to present the findings of the survey. The responses given on each survey question are ordinal in nature. The Mann-Whitney test and the Kruskal-Wallis test are non-parametric tests that are suitable for ordinal data types such as those resulting from the Likert type questions in this survey. These hypothesis testing techniques are used to establish whether or not the differences in results obtained on each response item are statistically significant. Statistically significant opinions will therefore form the core findings of this study.

The statistical significance test 'Chi-squared test for equal proportions' is performed and an explanation of this test is provided below. The Chi-squared test for equal proportions is a statistical test used to investigate whether the proportions of responses in each category are equal or whether there are statistically significant differences in the proportions of responses in each category. The null hypothesis of the Chi-square test is that the proportion of responses

that fall into each of these categories is equal and any differences observed are due to chance or random variation.

If the null hypothesis is true, then we cannot conclude anything based on the responses we observe, as these are essentially due to chance. We reject this null hypothesis of equal proportions at the 5% significance level (95% confidence) if the p-value of the test for that question is less than or equal to 0.05. The p-value is shown as Pr> ChiSq in the output below. A p-value less than or equal to 0.05 indicates that the results obtained are statistically significant, indicating the dominant and equal perception of respondents regarding the said questions in Ttable 2 below.

Table 2: Identified questions included in the questionnaire

BROAD OBJECTIVES	SPECIFIC FACTOR IN FINANCING
Factors considered important in deal making	Due diligence done by our firm /company IRR above a certain figure e.g. 25% Clear risk mitigation strategies Social impact needs to be high We prefer greenfield projects We prefer operating partners with equity Our exit strategy should be IPO Proven success in deal making Scalability of the project is a factor
The role of various categories of financiers	Angel investors Venture capitalists Private equity firms Development finance Commercial banks Investment banks Private foundations Public sector Multilateral arrangements with other countries Export credit agencies
Views on role of finance in driving the growth of the health sector	Financing can lead the improvement of healthcare quality There is need to wait for economic growth before financiers can play a major role Finance's role will grow as the ability and willingness to pay for customers increases Current models of healthcare may not work for the continent , we need newer models Need a more enabling environment for financing healthcare, currently can play a limited role
Enablers	**Policy on private sector involvement in healthcare** **General improvement on the ease of doing business in most African countries**

	Recession proof nature of the healthcare industry
Barriers	Regulatory environment not conducive for financing this sector General ease of doing business still not good in the continent Lack of risk mitigation options Cost of capital Lack of proper exit strategies Inherent risk of healthcare as an industry Underdevelopment of capital markets Lack of liquidity in the financial markets in Africa Lack of guarantees and mezzanine capital in financing Limited capacity of raising public revenue by governments Ability/inability to convert healthcare infrastructure to a viable asset class Time profile of cash flows, high initial risks and illiquidity Lack of investable projects Lack of appropriate clinical operators for healthcare Lack of viable profitability models Ability of populations to pay for longer term financing Efficient use of the resources that are available currently and poor track record of deal making in the sector
Models of financing	Syndicated Loans Equity issues Bond issues Operator finance Sale and lease back Joint venture Mortgage financing Debt securitisation Privatisation of existing public infrastructure assets Complete ownership of the project Contractor finance Long term concessions

The questionnaires were disseminated to the various potential respondents by way of email. All of the respondents were contacted before the email was sent so as to ensure that they were aware of the questionnaire. The majority of the respondents were known to the researcher, either on a personal or professional basis, and as a result the response rate was good with little follow-up required.

The description of the survey outcome is presented in Chapter 4, starting with the demographic profiles of the respondents, descriptive statistics and questions separated into unifying themes where the apparent perceptions and attendant policy guides resulting from these questions are discussed.

3.1.5 Limitations of the survey approach

According to Burns (2000), the use of questionnaires has both advantages and disadvantages, which need to be recognized and, as far as possible, catered for in the design. The limitations discussed here are those relating to the research design and research methodology. Although great care has been taken to identify the best possible research design and research methodology, there will always be potential limitations depending on the type of design and methodology used. Due to the limited time frame and lack of resources available to the researcher, the sample size may not be considered ideal, but it is large enough to provide valid and reliable references.

3.1.6 Ethical considerations

Due to the nature of the research design for this study, the potential for a breach in any ethical standard was unlikely. No direct contact with questionnaire participants was needed, thus no physical or psychological harm befell any person. No privacy rights were transgressed and all literature is properly referenced. All findings are completely reported, with no intentional misrepresentation of the findings of the study (Leedy and Ormond, 2006).

The researcher sent the questionnaire to the potential participants by e-mail and certain ethical considerations needed to be considered. All emails sent had a covering note explaining the nature of the research, the researcher's contact details and all participation was undertaken by all participants in their own time and at their discretion. Participation was completely

voluntary and ethical boundaries were not broken in this regard, particularly as participants responded anonymously.

This researcher also ensured that the intellectual property of others was completely respected at all times. Any use of another researcher's work is correctly and clearly attributed. The referencing guidelines are prescribed by the Wits Business School (WBS) and are followed for all source material. While there is always the potential for harm in any research activity, all reasonable attempts have been made to avoid such in this study.

4 RESEARCH FINDINGS AND DISCUSSION

"*We need to stop thinking about infrastructure as an economic stimulant and start thinking about it as a strategy. Economic stimulants produce Bridges to Nowhere. Strategic investment in infrastructure produces a foundation for long-term growth*"

Strive Masiyiwa, Zimbabwean Telecommunications Entrepreneur on venturing in social infrastructure.

This chapter provides results of the survey.

4.1 Survey sample

The survey consisted of 17 questions, targeting seven different occupation categories shown in Table 3. It generated a total of 43 responses and six in-depth interviews. The summary of responses to the survey is provided first; then, a detailed analysis of these responses, grouped into unifying themes, is provided in the remainder of the chapter.The majority of the individuals interviewed were in charge of financing projects, and the minimum level of experience was 18 months working for the same company, but three years in the same industry, with 5/43 individuals have being in the industry for over 20 years. The survey sample reflected a sufficiently broad representation of individuals and companies involved in financing healthcare in Africa.

Table 3: A breakdown of the profile of respondents in the study sample

FIRM TYPE	NUMBER OF FINANCIERS INTERVIEWED
Private equity	5/43
Commercial bank	7/43
Development finance institution	5/43
Non-profit organisation	6/43
Government financiers (6 from ministries of Health and 5 from ministries of finance/treasury)	11/43
Medical insurance executives	6/43
Hospital executives	3/43
Total	43

4.2 Summary of results

The results of the important considerations made when financing healthcare projects are summarised in Tables 4 - 8. These are divided into five categories as follows

1. Project financing process of the various firms or organisations including the factors that are priority in deal making for the firm or organisation, reflecting the diversity of the firms or organisational representatives interviewed
2. Perceptions on the role that finance should play in driving growth of the healthcare sector compared to other factors
3. Perceptions on the type of financiers who should play a leading role in driving the growth of the healthcare sector, and the role that these should play
4. Perspectives on the enablers and barriers on financing healthcare
5. Models that could be considered for financing healthcare projects

Table 4: Factors considered in deal making

FACTORS CONSIDERED IN FINANCING A HEALTH CARE PROJECT	OBSERVED FREQUENCY					CHITEST	P VALUE
Factors considered in deal making by the financiers interviewed	**very important**	**important**	**neutral**	**not important**	**irrelevant**		
Due diligence done by our firm/company	36(84%)	2(5%)	0(0%)	2(5%)	3(7%)	8.54E-23	0,954
IRR above a certain figure e.g. 25%	6(14%)	8(19%)	1(2%)	26(60%)	2(5%)	1.03E-09	0.353
Clear risk mitigation strategies	8(19%)	10(23%)	14(33%)	10(23%)	1(2%)	0.031386	0.000439
Social impact needs to be high	2(5%)	15935%)	10(23%)	12(28%)	4(9%)	0.007754	0.000211
We prefer greenfield projects	0(0%)	3(7%)	1(2%)	23(53%)	16(37%)	4.72E-10	2.34E-17
We prefer operating partners with equity	8(19%)	9(21%)	11(26%)	10(23%)	5(12%)	0.650893	0.000211
Our exit strategy should be IPO	2(5%)	4(9%)	9(21%)	21(49%)	7(16%)	3.6E-05	1.18E-11
Proven success in deal making	6(14%)	7(16%)	0(0%)	13(30%)	17(40%)	0.000469	4.89E-06
Scalability of the project is a factor	7(16%)	8(19%)	15(35%)	10(23%)	3(7%)	0.061683	3.87E-05

Table 5 : Perceptions on players to be involved in financing healthcare

FACTORS CONSIDERED IN FINANCING A HEALTH CARE PROJECT	OBSERVED FREQUENCY					CHITEST	P VALUE
Views on the kind of financiers who should be investing in healthcare	**very important**	**important**	**neutral**	**not important**	**irrelevant**		
Angel investors	3(7%)	13(30%)	16(37%)	5(12%)	6(14%)	0.005711	9.4E-05
Venture capitalists	14(33%)	9(21%)	4(9%)	3(7%)	13(30%)	0.019167	0.007503
Private equity	23(53%)	8(19%)	5(12%)	1(2%)	6(14%)	1.11E-06	0.105633
Development finance	34(79%)	2(5%)	0(0%)	5(12%)	2(5%)	1.01E-19	0.26928
Commercial banks	5(12%)	13(30%)	0(0%)	20(47%)	5(12%)	7.9E-06	0.000439
Investment banks	4(9%)	12(28%)	2(5%)	19(44%)	6(14%)	0.00018	9.4E-05
Private foundations	32(74%)	3(7%)	0(0%)	7(16%)	1(2%)	4.17E-17	0.230566
Public sector	27(19%)	8(19%)	0(0%)	7(16%)	1(2%)	3.21E-11	0.230566
Multilateral arrangements with other countries	23(53%)	3(7%)	7(16%)	8(19%)	2(5%)	1.11E-06	0.025012
Export credit agencies	4(9%)	14(33%)	0(0%)	11(26%)	14(33%)	0.00098	0.000439

Table 6: Views on the role of financing in healthcare

FACTORS CONSIDERED IN FINANCING A HEALTH CARE PROJECT	OBSERVED FREQUENCY					CHITEST	P VALUE
Views on the role of finance in developing the heatlhcare sector	very important	important	neutral	not important	irrelevant		
Financing can lead the improvement of healthcare quality	7(16%)	2(5%)	7(16%)	23(53%)	4(9%)	1.71E-06	1.42E-08
There is need to wait for economic growth before financiers can play a major role	3(7%)	14(33%)	6(14%)	13(30%)	7(16%)	0.034605	0.000211
Finance's role will grow as the ability and willingness to pay for customers increases	27(63%)	12(28%)	0(0%)	2(5%)	2(5%)	3.8E-12	0.396583
Current models of healthcare may not work for the continent , we need newer models	30(70%)	9(21%)	0(0%)	2(5%)	2(5%)	8.58E-15	0.396583
Need a more enabling environment for financing healthcare, currently can play a limited role	23(53%)	10(23%)	0(0%)	7(16%)	3(7%)	1.9E-07	0.161516

Table 7: Models of structuring finance

FACTORS CONSIDERED IN FINANCING A HEALTH CARE PROJECT	OBSERVED FREQUENCY					CHITEST	P VALUE
Models of structuring finance	very important	important	neutral	not important	irrelevant		
Syndicated Loans	1(2%)	5(12%)	21(49%)	4(9%)	12(28%)	5.11E-06	1.18E-11
Equity issue	11(26%)	7(16%)	2(5%)	13(30%)	10(23%)	0.074536	0.000439
Bond issues	15(35%)	5912%)	3(7%)	9(21%)	11(26%)	0.031386	0.001588
Operator finance	18(42%)	1(2%)	3(7%)	10(23%)	11(26%)	0.000248	0.000859
Sale and lease back	31(72%)	0	5(12%)	4(9%)	3(7%)	2.47E-15	0.105633
Joint venture	13(30%)	10(23%)	6(14%)	7(16%)	7(16%)	0.425219	0.007503
Mortgage financing	18(42%)	5(12%)	5(12%)	9(21%)	6(14%)	0.007004	0.007503
Debt securitisation	16(37%)	16(37%)	0(0%)	6(14%)	5(12%)	9.48E-05	0.131832
Privatisation of existing public infrastructure assets	10(23%)	8(19%)	0(0%)	9(21%)	16(37%)	0.004199	0.000439
Complete ownership of the project	24(56%)	9(21%)	0(0%)	499%)	6(14%)	5.65E-08	0.161516
Contractor finance	19(44%)	9(21%)	3(7%)	8(19%)	4(9%)	0.000882	0.047908
Long term concession	15(35%)	3(7%)_	5(12%)	13(30%)	7(16%)	0.014208	0.000439

Table 8: Enablers and barriers to healthcare financing models of structuring finance

FACTORS CONSIDERED IN FINANCING A HEALTH CARE PROJECT	OBSERVED FREQUENCY					CHITEST	P VALUE
Enabler and Barries to financing healthcare	very important	important	neutral	not important	irrelevant		
Improved Policy environment in most African countries	24(56%)	3(7%)	1(2%)	12(28%)	3(7%)	1.07E-08	0.035091
Policy on private sector involvement in healthcare	26(60%)	4(9%)	2(5%)	9(21%)	2(5%)	1.03E-09	0.082971
Regulatory environment not conducive for financing this se	22(51%)	4(9%)	4(9%)	6(14%)	7(16%)	2.1E-05	0.025012
General ease of doing business still not good in the contine	31(72%)	3(7%)	0(0%)	2(5%)	7(16%)	1.25E-15	0.194519
Lack of risk mitigation options	10(23%)	4(9%)	0(0%)	16(37%)	13(30%)	0.000521	1.45E-05
Cost of capital	34(79%)	4(9%)	0(0%)	3(7%)	2(5%)	1.26E-19	0.352826
Lack of proper exit strategies	14(33%)	5(12%)	2(5%)	7(16%)	15(35%)	0.004653	0.000859
Inherent risk of healthcare as an industry	6(14%)	5(12%)	0(0%)	27(63%)	5(12%)	1.54E-10	3.75E-07
Underdevelopment of capital markets	32(74%)	5(12%)	0(0%)	3(7%)	3(7%)	1.03E-16	0.310206
Lack of liquidity in the financial markets in Africa	30(70%)	4(9%)	0(0%)	3(7%)	6(14%)	4.18E-14	0.194519
Lack of guarantees/ mezzanine capital in financing	15(35%)	12(28%)	0(0%)	3(7%)	13(30%)	0.000379	0.035091
Limited capacity of raising public revenue by governments	24(56%)	8(19%)	3(7%)	5(12%)	3(7%)	2.37E-07	0.131832
Ability/inability to convert healthcare infrastructure to a vi	5(12%)	4(9%)	0(0%)	16(37%)	18(42%)	7.09E-06	1.42E-08
Time profile of cash flows, high initial risks and illiquidity	19(44%)	10(23%)	4(9%)	5(12%)	5(12%)	0.001088	0.063784
Lack of investable projects	29(67%)	3(7%)	4(9%)	4(9%)	3(7%)	2.16E-12	0.131832
Lack of appropriate clinical operators for healthcare	10(23%)	11(26%)	3(7%)	5(12%)	14(33%)	0.050956	0.002788
Lack of viable profitability models	17(40%)	12(28%)	0(0%)	7(16%)	7(16%)	0.000882	0.063784
Inability of populations to pay for longer term financing	30(70%)	8(19%)	0(0%)	3(7%)	2(5%)	1.69E-14	0.352826
Inefficient use of the resources that are available currently/	17(40%)	13(30%)	0(0%)	7(16%)	6(14%)	0.000469	0.082971

4.3 Analysis of the survey responses

The survey responses are divided into five themes to capture perspectives on the following:

- The type of infrastructure that financiers are involved in financing
- the processes the firms go through when financing healthcare infrastructure;
- the role that finance plays on growing the healthcare sector;
- the various types of financiers and funders relevant for Africa;
- the enablers of and barriers to financing infrastructure; and
- models of financing healthcare infrastructure for Africa

4.3.1 The type of infrastructure that respondents financed

The nature of the projects financed over the last three years is as shown in Table 9 below

Table 9 : Nature of financing the respondents were involved in

Capital (brick and mortar)	Capital (large value equipment)	Operating costs core to clinical operations	Operating costs Administration and salaries
19/43	28/43	7/43	11/43

4.3.2 Questions on overall financing of the healthcare infrastructure

All individuals interviewed were involved in financing a healthcare infrastructure deal, either as recipients of the financing (for the government officials) or in providing grants for infrastructure (the not-for-profit foundations) and largely make up the group surveyed here. However the interviewees from the medical insurance industry (6/43) are mostly involved in the demand financing, rather than infrastructure financing.

This question sought to deduce factors that are unique to healthcare investing with reference to the deal making process. The activities involved in the project financing process were similar across the respondents. However different emphasis was placed on various

aspects of deal making, for example, due diligence was an important part of private sector financing for private equity people who seemed to shy away from deals involving government. As such, due diligence was considered the most important factor in deal making; an important but not unique factor to hospital infrastructure. Combining deal making characteristics for both private and public sectors, the results are shown in the frequency Table 10 below.

Table 10: Important factors during the project financing process

Factors considered during deal making	# scored as important or very important
Due diligence done by our firm /company	23/43
IRR above a certain figure e.g. 25%	7/43
Clear risk mitigation strategies	6/43
Social impact needs to be high	17/43
We prefer greenfield projects	16/43
We prefer operating partners with equity	19/43
Our exit strategy should be IPO	6/43
Proven success in deal making	10/43

This table illustrates that due diligence and the social nature of healthcare sector are important considerations in project financing. In addition having equity also attracts investors, mainly as a risk mitigating measure. Most of the respondents highlighted the need to look at risk mitigation when investing, but that it was not a factor exclusive only to the healthcare sector:

"*Like any investor, one needs to understand the risks in any deal, and these are purely risks of doing business. Healthcare risks are largely regulatory, and where there is policy predictability we usually do not worry*"

While the "type of healthcare project" was not a really significant factor, some of the respondents said it was always better to invest in a going concern when investing in private healthcare, because the clientele is there and the type of services to be offered is clearer. However some respondents mentioned that because of the need to invest in healthcare

greenfield projects, it was increasingly important that the team involved in due diligence also has capability to start projects from the scratch, as there was a growing need to do so in both public and private healthcare.

For private equity involvement in healthcare, certain nuances on the type of deal that the firm got into were mentioned. These included the shift from the traditional emphasis on scalability and exit from a project for example through an IPO to attracting more patient capital. As such private equity firms often bundled their investments with patient capital from foundations, such as the Amman Foundation for the Abraaj Private Equity Firm, or extended their exit from five to eight years.

The question under review reveals that the process of deal making in healthcare is not any different from deal making in other infrastructure projects. These responses are in line with what is in the literature (Dong and Guo, 2013), except that most of the players place an emphasis on social impact. This is not surprising though, given that in infrastructure nomenclature, the healthcare sphere is considered to be a social sector. However, this social sector is attracting many players to the industry as one of the respondents illustrates:

"..*in the last ten years we are seeing a growth in private equity and venture capital in the industry. While these investors are looking for high returns, there is a social return undertone that we are seeing for most funds dedicated to the sector. The World Bank for example is invested in a number of private players to invest in healthcare. It is a good omen for the sector.*"

4.3.3 The role of finance in driving growth in healthcare

This question sought to understand the perspectives of respondents on the role finance plays in driving the growth of the healthcare sector, stemming from the literature review findings on economic arguments of investing in the health of citizens.

The responses to this question are indicated in Table 11, and reflect that financiers perceive a positive correlation between economic growth and healthcare; in that healthcare development is also an indicator of economic growth. The following results from the Likert scale based responses indicate the perceived role of finance for those who rate it very important and important

Table 11: Responses related to the role of finance in growing the healthcare sector

Perspective	Score for very important and important
Financing can lead the improvement of healthcare quality	18/43
There is need to wait for economic growth before financiers can play a major role	13/43
Finance's role will grow as the ability and willingness to pay by customers increases	10/43
Current models of healthcare may not work for the continent, we need newer models	7/43
Need a more enabling environment for financing healthcare, currently can play a limited role	13/43

The starting point for most respondents was that better financing would play a role in improving the standards of healthcare for the populace, both for private and public sectors. However, efficient use of finance rather than just finance itself was emphasised, meaning that if resources are channeled in a prudent way, the outcomes in terms of better quality healthcare would be immense. This assertion corresponds to Dafflon and Vaillancourt's work on strategic financing of healthcare as part of improving efficiency (Dafflon and Vaillancourt, 2014).

An interesting analysis on this is the sequencing factor, on what comes first, economic growth versus quality healthcare. While in no doubt that a relationship exists between the health of citizens and the economy, this growth according to one respondent, depends on a country's stage of development. One respondent also made reference to the clear argument made on HIV in South Africa where the economically productive populations were dying and that adversely affected the economy. As such, the responses indicated a sequencing of healthcare improvement relationship with finance stemming from growth in the overall economy. Most of the respondents acknowledged the importance of healthcare in the economy and that the financing gap for healthcare infrastructure continues to be a challenge. These assertions are summed up in one response from an in-depth interview:

The argument of the role of finance in healthcare is a clear one. Economic growth leads to healthcare industry growth, but this tends to plateau. Finance can then be deployed for catalytic projects that spur innovation."

This argument has also been made indirectly for infrastructure in general, where the role of finance in economic development is clear. As some authors observe, finance leads to both economic and infrastructure development to a certain extent, but economic development also plays a vital role in enabling financial investments into healthcare to yield tangible value (Weber and Alfen, 2010, Della Croce and Gatti, 2014). It was not clear however from the responses whether there is a certain level of economic growth needed to avoid this plateauing – but suffice to say most respondents (25/43) made a comment on the role healthcare plays in economic growth - some with a caveat as one of the respondents mentioned:

"We understand the old argument that healthy citizens lead to better economic prospects of a country, however, something needs to happen to unlock the economic potential of Africa's middle class so that the pool of wealth they produce can start to lead to economic growth. This argument is not unidirectional"

However there were two dominant views about the financing gap for healthcare in Africa, first a majority view that there is a financing gap for healthcare (28/43), and another view that the sector is sufficiently funded but money is not been used efficiently(11/43). Overall, respondents saw the importance of financing infrastructure, a few respondents pointed to the need for government to be at the forefront of financing the growth of the sector.

Another discussion that emanated from the in-depth interviews was mention of retrofitting of healthcare finance with the overall economic plans of a country. For some respondents there was a concern that the financing community needs to continually make an economic argument on why healthcare should be prioritised while the healthcare policy makers are reluctant to make those investments. As demonstrated in literature, this concern could be quailed by demonstrating the protracted value of investing in healthcare infrastructure to the overall economy as observed by Sachs *et al.* (2002). One of the respondents from government stated:

"We cannot build everything – resources are, after all, limited. The real value of infrastructure lies in the economic and social activities it supports, rather than the limited benefits that are generated during the construction phase. Social infrastructure like health and education should support core economic activities. We can't just focus on building schools without creating jobs, where will those children later be absorbed?"

Such a view is also supported by other authors, who state that the financing of healthcare infrastructure is like an orphan, given that its often left to the privy of government (Diagnostic *et al.,* 2010) However, as more private sector players come on board, the orphan status of healthcare financing may be history in Africa as healthcare and education are moving from being purely socialist sectors to be drivers of economic growth – as one respondent working in private equity alluded:

"*I used to believe that all the sharks are in mining in South Africa; now that I work in financing healthcare – I am seeing the ones left out of mining are in healthcare*"

Clearly finance would lead to further growth of the sector, but an important variable observed by the respondents is the overall growth of the economy, which is needed to finance the operations for healthcare. Time will tell to what extent the healthcare sector becomes an engine of the economy, however the role of finance is clear in accelerating this growth as one respondent from a development finance institution observed

"*Our finance projects currently span from technology to building manufacturing plants for pharmaceuticals in Africa. As an institution, we understand the role that healthcare can actually play in the larger economy, and finance can play a significant role in driving that growth*".

Finance therefore was seen as an enabler for growing the healthcare sector. While the investability of the sector could be improved by the larger economic growth, healthcare was also perceived as becoming a major part of economic growth. More studies are needed to understand the nature of the sequencing between economic growth, financial deepening and

healthcare of citizens as to guide investment decisions for financiers and support the role of healthcare in the economic development agenda.

4.3.4 Perspectives on the sources of finance for healthcare

The various participants all knew they had a role to play in financing healthcare, but the role of government was considered more important in growing the sector, largely because of their responsibility for creating an environment of equity and access to healthcare. These are the results from the Likert scale:

Table 12: Types and sources of finance for healthcare

Specific factor in financing	N=43				
	Very important	Important	Neutral	Not important	Irrelevant
Angel investors	13	3	7	12	5
Venture capitalists	12	2	5	15	6
Private equity	24	13	0	2	1
Development finance	31	9	0	0	0
Commercial banks	19	8	1	7	5
Investment banks	18	11	2	5	4
Private foundations	7	12	3	10	8
Public sector	29	6	0	5	0
Multilateral arrangements	17	6	1	4	12
Export credit agencies	6	4	10	10	10

Governments and donors currently play a leading role in financing healthcare as shown in the table. This is in keeping with what is found in literature, that healthcare infrastructure has been the responsibility of government, and consequently remains underfunded as alluded to by the respondents.

> "*The challenge is that most of the African governments were part of the bandwagon that promised health for all by 2000, without any understanding of who was going to fund this ambition. Consequently, the declarations that you are talking about, [***Abuja Declaration***]*

are forcing governments to fund healthcare, but even that is not possible. We need to open up private sector involvement more"

Another: "*What is the commodity that both a rich man and a poor man would sell their entire wealth reserves for? It's healthcare…….so why don't we create structures that enable even the poor man to pay for their healthcare? Private sector, not government as we think, pays for healthcare through out of pocket expenses*"

These narratives confirm that the government is still in charge of funding healthcare largely, but there is need for private sector interventions to increase sources of infrastructure financing.

The importance of donor funding for healthcare was mentioned as being crucial and that if the governments in Africa could have properly planned initiatives that would channel such funds, they could help in unlocking long term value in healthcare. As such, respondents from donor agencies that were interviewed indicated that their role has shifted over the years, from that of being providers of unrestricted funding to ensuring investments into sustainable and scalable projects. In many instances partnering with governments was necessary, with one example of an individual from a private foundation illustrating that they initiated a healthcare infrastructure bond that is targeting infrastructure at the bottom of the pyramid.

The role of government in creating an enabling environment for other investors to come in was mentioned by some of the respondents. However; other respondents saw this role of government as both a financier and a healthcare regulator as problematic as it crowds out the private sector:

"*The government cannot be both the regulator and the major provider of healthcare – that's why we are in a mess. Instead they should set the rules, monitor them, and incentivise those who perform best. I don't think all these services in state hospitals are better run by government. There is too much inefficiency*"

As shown in Table 8, the role of government and development finance institutions was higher. This is contrary to what is seen in other industries where capital markets still play a prominent role, particularly the bond market (USGTreasury, 2014). Seemingly few individuals saw the capital markets as relevant for Africa's healthcare infrastructure challenges given the high interest rates that result in a higher cost of capital

The respondents also viewed development finance institutions as the key in large infrastructure projects for both the public and private health space – while the role of private equity in the private healthcare space was considered to be increasingly important. The latter, with the advantage of being equity players as well, are starting to bring in efficiencies in both the construction phase and in running the facility once built:

> "*I see the involvement of private equity as key in providing healthcare. We are partnering with them in Greenfield projects and you know they will squeeze every margin you have as a medical supplies company. It's good for them, but not good for us*"

Indeed two respondents from donor organisations considered the role of private equity to be growing together with venture capital in financing the mid-size deals and not the larger deals. However the role of commercial banks was seen to be declining especially in financing entrepreneurs as one respondent from Kenya noted:

> *"You can't finance a hospital with interest rates of up to 30% as we see some banks doing. If you are an entrepreneur you need better sources of capital but you also need someone to walk with you especially in untraded territory"*

Respondents acknowledged the visibility of multinational companies in healthcare infrastructure, either as participants in the construction of facilities or as providers of capital. Most of these firms have a financing arm associated with their business that enables customer financing for large scale equipment. The respondents saw this as a key opportunity for Africa to leapfrog its healthcare systems. This is in keeping with literature on MNCs, whose presence in a country alters the way business is done. China has so far been an important player in partnering with governments on infrastructure deals, where the multinational companies rode on government-to-government relationships, even though some of them would finance projects on their own. This trend, as alluded to by one of the respondents, was also becoming common with US companies partnering with donor agencies to participate in financing healthcare infrastructure projects under long term concessions.

> "*The social nature of healthcare is such that you see many donor agencies who are already working in the sector partnering with private sector companies for infrastructure*

development. This could be for innovation, and is reflecting the different approaches by donors, it's no longer them and us, and it's about working together to finance this infrastructure gap"

In conclusion, governments and development institutions were seen as the leading players in financing healthcare infrastructure. The former, according to some of the respondents, needed to participate more as a regulator so as to allow more private sector players into healthcare, while not relegating its responsibility to provide healthcare to citizens. This is contrary to most scholarly work where the calls to action are for government to provide financing from the fiscus (Wang *et al.,* 2012, Velenyi and Smitz, 2014).

However, a slight shift from this view is that there is a middle ground, where some of the respondents said there shouldn't be any diversion from the role of government in financing healthcare for the public, but that private sector expertise should be leveraged through public-private partnerships. This dominant view from the respondents is in keeping with scholarly work on financing healthcare, particularly in financing service delivery and in risk sharing (Ng and Loosemore, 2007, Marek *et al*., 2005, Richter, 2004).

Most respondents observed the need for governments to shift in the way they funded healthcare, recommending that this should be in a catalytic way that unlocks value to enable more private sector players. This would in turn allow infrastructure to generate longer term value beyond the construction phase. In addition, respondents saw a shift in financing infrastructure with the role of private equity becoming more prominent, and commercial banks working through intermediaries rather than direct financing. According to the some of the respondents, this trend might continue, as this quote illustrates:

"The destination for most private equity players in healthcare is certainly Africa. Initially the common complaint was that there are no deals, but increasingly these firms are setting their eyes on Greenfield projects."

This is in keeping with scholarly work on financing infrastructure in general, where innovative financing strategies are being set up in most African countries. Infrastructure in general is no longer the sole duty of governments to provide, but rather development banks and private equity firms are playing an increasing role.

As Krageflund (2011) alluded, the sources of finance undergo a transition as the financial deepening happens in a country, shifting from government and donor agencies being the major players, to having development banks dominate, then private equity and venture capital unlocking value especially in smaller deals (Kragelund, 2011). One would equate this transition to the demographic transition that most of Africa, despite its heterogeneities, is undergoing. More research is however needed to understand the correlation of these transitions. Indeed as Kragelund (2011) further demonstrates, the shifting role of donors and private foundations is illustrious of this transition, in that they are moving from purely philanthropic ventures to expectations on return on investments by investing indirectly through infrastructure bonds for example, or having for-profit enterprises as part of their private foundations.

4.3.5 Models to structure finance for public sector

The questions related to this theme were on the financing models for healthcare infrastructure. This section was set to deduce from the financiers' experiences what is being used elsewhere in the world and what could be the best model to finance healthcare in Africa. Infrastructure in this case includes long-life medical equipment and the infrastructure for clinical care such as buildings, energy and water supplies.

The question was what models have you used in financing healthcare projects before and what is its relevance to Africa's public sector? The results from the survey are illustrated in Table 13 below:

Table 13 : Funding models for healthcare infrastructure

Specific factor in financing	N=43				
	very important	important	neutral	not important	irrelevant
Syndicated Loans	1	5	21	4	9
Equity issue	11	7	2	13	7
Bond issues	12	5	3	9	11
Operator finance	15	1	3	10	11
Sale and lease back	23	8	5	4	3
Joint venture	13	10	6	7	4
Mortgage financing	18	5	5	6	6
Debt securitisation	16	13	0	6	5
Privatisation of existing public infrastructure assets	10	5	0	9	16
Complete ownership of the project	24	6	0	4	6
Contractor finance	19	6	3	8	4
Long term concession	15	3	2	13	7
Management operation contracts	23	4	3	4	4
Public-private partnerships	26	8	1	2	6
Rights issue	9	7	0	17	7

The following illustrates the perspectives of the financiers on the most important models that could be used in financing public healthcare infrastructure. Respondents identified other models of financing infrastructure in healthcare. Additional mechanisms that were seen to be promising for the future of healthcare are explained below.

4.3.5.1 Funding healthcare through public-private partnerships

PPPs are one of the most common forms of structuring healthcare infrastructure finance worldwide, and are becoming increasingly common in Africa. Different forms of PPPs exist, but various criticisms of the way most of them are conducted in Africa were raised by the respondents.

During the in-depth interviews, one respondent on success of PPPs stated:

"*there is an inherent assumption that private sector is efficient when it comes to funding and delivering the infrastructure projects. In my experience this is not the case. Most of the time, risk of a project is usually transferred to the government when the returns are in the private sector. We are changing the way PPPS are going to be run, we would rather build capacity in the private sector to deliver rather than outsource our core capabilities*"

This perspective is shared by some authors who have looked at the performance of PPPs set up elsewhere on the world, like Vecchi *et al.,* 2013. On the other hand, there have been attempts to involve the private sector in the creation of public infrastructure but not with the commitment, the consistency, or the legislative protection that would encourage and protect private sector investment and encourage long-term partnerships in most African countries. Where governments are developing a trusting relationship, considering that it is nearly impossible for governments to deliver healthcare infrastructure alone, PPPs will become increasingly dominant in the way infrastructure is developed, as observed in some analyses (Marek *et al.*, 2005).

The most common forms of PPPs included the sale and lease back, management operator contracts and complete ownership of the project being discussed − where the private sector gets income from running the entity that is leased by government. In addition the complete ownership of a project, where the private sector runs a radiology department or runs the hospital was also common. In this regard the private sector would be selling services to government, and the specific offering is run as a going concern.

4.3.5.2 Funding through private sector markets

According to the respondents, this is another form of financing that will become popular in financing healthcare infrastructure. As found in literature, when dealing with private sector involvement in private healthcare the most important funding source is the private sector capital markets including both debt and equity. Various sources and models of financing suitable in the African healthcare infrastructure landscape follow.

4.3.5.3 Dedicated financial institutions for infrastructure

Given the urgency of ensuring that healthcare infrastructure assets meet the needs of the population, a national infrastructure bank or fund could be set up, not only to finance healthcare infrastructure activities, but to finance other infrastructure backlogs in many countries. When Zimbabwe made it possible to have financial resources dedicated to funding the HIV response, the performance from a programme perspective was hailed as best practice (Mpofu and Nyahoda, 2008). National savings could start an infrastructure bank as happened with the Land Bank in South Africa. Some respondents criticised the idea of an infrastructure bank:

"*you are just creating an inefficient bureaucratic arrangement that often favours the elite,*" as one respondent said.

However if projects are selected with cost-benefit analysis in mind, rather than politics, the prospects for such a bank may not be far-fetched. The project selection process would be evidence-based, and thus the possibility of having such a bank may be a welcome idea, considering the likely prospect of a BRICS bank for emerging markets.

4.3.5.4 Deepening demand funding

This form of financing was hailed as urgent by most of the respondents where in the capitation costs of healthcare infrastructure could not be divorced from the operating costs. However, evidence shows that most of Africa's citizens are not health insured, and as such governments are accelerating the development of social health insurance schemes (Spaan *et al.,* 2012). When there is flow of funds to match cash flows, refurbishment of infrastructure and purchasing of new equipment is then possible. This would in turn lead to better business models for healthcare. When the ability of a hospital to raise finance does not exist, there is a risk that the infrastructure will continue to deteriorate from its existing poor level.

Other sources of debt financing that needed to be explored further included the use of institutional funding. Pension and mutual funds in particular are of increasing importance in infrastructure finance in general but have not funded healthcare infrastructure in depth, as stated by this respondent:

> "*There is an increased involvement of the PIC in the social sector, with opening of a Heath Care Fund administered through private equity. Also there is a growing trend*

of risk sharing between public and private sector financiers, even if they are risk sharing."

This leads to a discussion on channelling such savings to infrastructure in general:

4.3.5.5 Mutual and pension funds

There is evidence that some countries in Africa are beginning to attract long-term savings and converting these into long-term investments albeit on a small scale.(Stewart and Yermo, 2009). This trend is set to grow in the future (Kpessa and Béland, 2012, Gelb *et al*., 2014) as the institutional reserves accumulate. As such, most respondents saw an opportunity for pension funds to shift their investment strategies from equities and move towards infrastructure as an asset class necessary for their long-term pension requirements.

"The savings pool from most pension funds has been growing over the years giving options for infrastructure investments in South Africa. That said, we need to look at profitable business models for public sector hospitals, as this does not exist at the moment unfortunately. Long-term investors need that assurance from a private sector point of view".

This observation is in line with scholarly thinking on converting pools of savings to long term investments in South Africa and elsewhere in the world (Watson, 2012). If these investments are long duration assets that are expected to produce stable returns in excess of those obtained in the fixed income markets however, healthcare business models should be looked at - something that is discussed under recommendations for further research in this paper.

4.3.5.6 Establishing financial institutions to underwrite low interest loans specifically for investment in healthcare infrastructure

"An example of such a bank would be the Land Bank which is dedicated to unlocking potential in farming by affording individuals land."

As such, an infrastructure bank would help finance transformative projects of national importance as one respondent illustrates through this statement:

"*A country needs to have dedicated funding to finance its competitive advantage. China did the same kinds of investment…. which for Africa, when properly designed, would bring efficiency in funding projects.*"

This type of funding would help to increase efficiency, avoiding political rhetoric that haloes infrastructure projects illustrated by Fedderke and others observed back in 2006 (Fedderke *et al.,* 2006).

4.3.5.7 Other private sector investment tools

Specific notes on matching cash flows and mitigating risk of projects in the public sector in PPPs were cited by respondents as follows

"*Funding through local government for full implementation of the healthcare infrastructure projects with options of repayment back to treasury, including implementing insurance strategies such as the NHI in South Africa and the Health Bill in Nigeria.This would stimulate the growth of the health sector in these countries*".

However, the same respondent stated that the major challenge for such an approach would be the inequality gap that exists in provinces and countries, which are resource poor and may not be able to raise such resources. This is in keeping with analysis that government involvement would also stimulate the growth of the health sector (Onwujekwe *et al.*, 2014). According to one respondent, this approach would ensure devolution of power creating autonomy for local government.

A respondent stated: "*Provide prefunding via the Ministries of Health at a national level, [not through Ministries of Public Works]; and once an infrastructure project is bankable through proper revenue collection, an SPV could refinance it off budget and repay*".

In the case above, Treasury would provide pre-funding for the commercial portion. As such, the project is implemented while being fully refunded at a future point in time, with full costs to be recovered over time. This would ideally fit a model of revenue collection in the public sector hospitals with tiered pricing and tiered services to generate more revenue. Governments guarantee for the full cost of the project. An example of this was provided from Zimbabwe.

Another respondent: "*To mitigate risks of project, government could also provide a guarantee for the commercial portion until full incremental commitment by commercial users*".

This example was given from Lesotho where government has purchased equipment using such guarantees for mission hospitals. In the Lesotho case, the government makes good the shortfall in the income stream to repay the loans sourced in the market and the risk on providing the guarantee is limited to periods of shortfalls and not full exposure of the loans. At times government can only provide short-term interest cover guarantee for until projects are bankable.

Borrowing from how social infrastructure is funded in general, ministries of health and finance could jointly work together in applying incentives such as matching ratios to stimulate investment - this would appeal especially to donors who often want to match government commitment.

"*In Mozambique, there is a social fund, often supplemented by donor agencies to become a healthcare fund. This fund is managed in a way that it provides government guarantee for infrastructure projects but not directly funding these projects. This becomes an underwriting commitment for the balance of the project life*".

Using specified matching ratios, one of the respondents has been involved in creating such a matching fund for healthcare infrastructure in Tanzania. Increasingly, as one respondent from a donor agency observed, cases of matching funding from donors with government funding for infrastructure are becoming more common, both for risk sharing and sustainability as the government s are expected to take over the maintenance and the operations of a building once its operational.

Another suggestion was through preference shares issued by development financiers, which was common in other infrastructure projects, but not as common in healthcare infrastructure:

"*The role of these finance institutions would be to take care of cash flow mismatches only, rather than fully financing the project being implemented through an SPV enabling SPV to raise funding off-budget for the commercial portion".*

One risk mentioned in literature is refinancing risk; even in cases where a project is underwritten by government, they would not accept non-guaranteed refinancing risk. SPV should be able to refinance later in the life of the project as construction risk is eliminated and revenue streams would have been established.

Other forms of financing stated in the in-depth interviews and rated as important on the Likert scale were:

- Utilisation of Build Own Operate Transfer schemes
- Encouraging financial institutions to underwrite low interest loans for the investment in healthcare infrastructure, which would involve making a strong business case for infrastructure development.
- Tax-free bonds for infrastructure could also have a percentage dedicated to social infrastructure. The challenge is that this model is dependent on the macroeconomic conditions of a country, especially the rating of the country in the capital markets. This observation is in keeping with what some scholars call Africa's disadvantage where in a country with fairly good governance ratings could not raise infrastructure financing for its energy projects (Azulle and Hundal, 2013). Whether this disappointment is sector specific or not is unclear, and more research is needed, given that healthcare is considered a social infrastructure, chances are that it may be harder to obtain a fully subscribed bond.
- Related to tax free bonds are public sector subordinated notes. There was general consensus that to mitigate risk in funding healthcare projects, innovative ways of ensuring public sector and private sector capital work well alongside each other, were needed. However most of the participants were not clear on how this could be done, but suggested borrowing lessons from other sectors such as the energy and water sectors, that have sued subordinated notes before. Accordingly, simple provision of public sector grants does not meet these goals. Another way to achieve this would be through government-issued subordinated notes.

- Other debt mechanisms identified include accessing of capital markets for specific and dedicated financial assistance such as revolving loans and other similar debt structures. However, as illustrated in line with findings of the literature review, the respondents observe that these financing mechanisms often attract high interest, and the nature of infrastructure funding should be a long-term low-interest source of capital (Robert, 2003). The challenge for capitation costs of a hospital could also be met through accessing of capital markets for specific and dedicated financial assistance such as revolving loans and other similar debt structures. This could enable short-term financing for large scale equipment such as MRI machines, whose use in turn could generate more revenue.
- Running each healthcare facility as a private concern but with community ownership structures. This would encourage efficiency in running the facility, and such a method has been successful in Nigeria in partnership with Shell, where community clinics are run as profitable businesses (Onwujekwe *et al.,* 2014).

Other models mentioned but that did not undergo statistical scrutiny in this study include the use of subordinated notes, having infrastructure bonds issued by the state and superannuation funds. The latter includes public sector co-investing equity alongside super funds and provides revenue guarantees over the asset for a specific period of time. The guarantee would fall away once certain revenue thresholds had been met, which could be three to four years after the new infrastructure has been opened. Here, the public sector is simply providing a bridge for private sector finance.

In conclusion, this discussion shows that these financing mechanisms have been implemented piecemeal across Africa, but are not commonly referred to, and as such PPPs in government could learn from each other and devise strategies to match cash flows and mitigate risk.

4.3.6 Enablers and barriers in financing healthcare

In order to improve healthcare's investability profile, several factors could act as enablers and barriers .Many of these are unique to healthcare as a sector; and yet others encompass the issues around doing business in Africa. The factors that affect investability of the healthcare

infrastructure in Africa relate to the factors that hinder or enable development in general, which include the ease of doing business. For example, the issues related to attracting and developing entrepreneurial talent in Africa for any sector have been researched by some authors (Ladekarl and Zervos, 2004, Klapper *et al*., 2010, Goedhuys and Sleuwaegen, 2010, Harper, 2013, Bhattacharya and Londhe, 2014, Couyoumdjian, 2012, Cerqueti and Coppier, 2011, Iapadre and Tajoli, 2014, Iacovone and Ramachandran 2014).

Major factors highlighted as barriers in this study resonate with factors that affect the ease of doing business, and include long term financing; lack of investable projects, underdevelopment of capital markets, liquidity in the markets, capacity of government to raise revenue, general ease of doing business and policy issues. In terms of enablers, the fact that healthcare always had demand was risk mitigating in most instances. In addition, as shown in literature, the recession proof nature of healthcare was also seen as a plus, as the results show this was statistically significant.

This question probed the respondents on what they thought about the factors listed in Table 10, and what suggestions they had for other factors. The results are shown in Table 14.

Table 14: Enablers and barriers in financing healthcare in Africa – a summary

	Percentage frequency				
Specific factor in financing	very important	important	neutral	not important	Irrelevant
Policy environment in most African countries	60	7.5	2.5	22.5	7.5
Policy on private sector involvement in healthcare	57.5	10	5	22.5	5
Regulatory environment not conducive for financing this sector	47.5	10	10	15	17.5
General ease of doing business still not good in the continent	70	7.5	0	5	17.5
Lack of risk mitigation options	25	10	0	37.5	27.5
Cost of capital	77.5	10	0	7.5	5
Lack of proper exit strategies	27.5	12.5	5	17.5	37.5
Inherent risk of healthcare as an industry	7.5	12.5	0	67.5	12.5
Underdevelopment of capital markets	80	12.5	0	7.5	0
Lack of liquidity in the financial markets in Africa	75	10	0	7.5	7.5
Lack of guarantees / mezzanine capital in financing	37.5	22.5	0	7.5	32.5
Limited capacity of raising public revenue by governments	60	12.5	7.5	12.5	7.5
Ability / inability to convert healthcare infrastructure to a viable asset class	12.5	10	0	32.5	45
Time profile of cash flows, high initial risks and illiquidity	47.5	17.5	10	12.5	12.5
Lack of investable projects	65	7.5	10	10	7.5
Lack of appropriate clinical operators for healthcare	25	27.5	7.5	12.5	27.5
Lack of viable profitability models	42.5	22.5	0	17.5	17.5
Ability of populations to pay for longer term financing	87.5	12.5	0	0	0
Efficient use of the resources that are available currently / poor track record of deal making in the sector	42.5	32.5	0	10	15

These could be divided into finance factors, general business condition factors and project specific factors. While the project specific factors tease out the healthcare infrastructure in

particular, the former two categories speak to the economic well-being of the continent in terms of overall investability. As such, it is recommended that healthcare infrastructure development not happen in isolation, but in the broader framework of infrastructure development. The challenge though, as shown in literature, is that in such discussions, healthcare infrastructure is left to the privy of government who are clearly not coping with the growing demands on the available infrastructure.

Some barriers need specific mention. Demand financing is a critical factor in delivering quality services in healthcare, and the reason cited by most respondents as to why infrastructure remains underdeveloped. One of the respondent's states:

"…*the status quo cannot be sustained - our model of medical insurance can be scaled up by government, it is low cost and can attract pools of money that can be used for better infrastructure.*"

This assertion is also in line with literature findings on long-term financing, pooling of risk (Lagomarsino *et al*., 2012, Gaag and Stimac, 2012) in order to increase resources for healthcare. Gaag and Stimac (2012), state that, without long-term financing, it is difficult to convert initial social investments in healthcare to economic returns, where healthcare becomes a contributor to the economy. As such, this topic warrants further research on innovative ways of bringing healthcare insurance to the population – and consequently converting the gains to economic productivity. Such schemes are underway in countries like Ghana and Tanzania, where respondents cited being involved in the design of demand financing mechanisms. This is in line with case studies highlighted in literature (Mills *et al.,* 2011).

Mills *et al.* (2011), touching on healthcare business models, assert the importance of viability of models in matching revenue with costs. For example long-term insurance could provide such, but government funding could also provide this match. However as some of the respondents stated, "*Healthcare business models are often tainted with the social imperative of health provision as a fundamental human right*". As such, pure cost recovery models often fail, or are thwarted by policies and as some authors state, rightfully so (Mills and Hsu, 2014, Horton and Lo, 2013).

Another barrier raised by the respondents relates to the financial markets, where the cost of capital, lack of liquidity and the capacity of government to raise revenue resulted in shortages of funds. Perhaps these are the very reasons why innovative financing mechanisms are needed for healthcare infrastructure. Where financial markets are developed, with better financial deepening, it has become increasingly easier to open up private sector and attract entrepreneurs. This finding from the research is therefore in keeping with what is in literature on financing in general, although not unique to healthcare.

Related to this and not surprisingly, there are still too few deals for some of the financial players such as private equity firms, and many have shifted from seeking brownfield investments to Greenfield projects. As such they have to develop in-house expertise that involves building and architectural expertise, in addition to investing in the business of hospitals. This is contrary to other infrastructure projects, where there is shortage of funding rather than shortage of deals to be made. Indeed a caveat is placed on the nature of private equity deals, which are rarely in the public sector space.

As seen in literature, the dynamics for change in the healthcare sector lies with governments' role as investor versus the role of regulator. The kind of assets a government invests in could either be catalytic or could crowd out other funding sources and other players. In the healthcare infrastructure environment innovation is required for the role of government; for example in providing a guarantee of finance to match cash flows and reduce risk; regulation that allows a sector to grow etc. A respondent from Ethiopia cited that it is difficult for foreign players in the market place, and government could do more to open up the space to attract healthcare investments.

Elaborating on this point, one respondent said on the role of government:

"...government needs a mechanism to identify trends and invest in catalytic assets that will open up the sector. It is heavily regulated, such that those who are in have become too powerful to compete with."

Seemingly, healthcare investing has many barriers, but the sector remains attractive for two main reasons, firstly the demand for healthcare is rising as the demographic patterns shift, and secondly the nature of the industry being recession-proof attracts many players. In cases where the barriers of entry are high, such as in healthcare, strategic financing could be a catalyst to attract more investors. The nature of the relationship however is not obvious, on whether the industry as to change first for more players to come in; or the other way round, and warrants more policy conversations.

Lastly, a group of barriers involved the ease of doing any business in Africa. The doing business report for Africa clearly articulates the factors that are necessary to improve investability in a country, including on infrastructure. It seems plausible that there is a bidirectional relationship between developing infrastructure in general and healthcare in particular – as the former improves the ease of doing business. This assertion, also made by Sachs (2007), on investing in health resonates from this study. As some authors point out, it could be that as Africa develops, and as the disease burden shifts from emergency infectious diseases such as HIV and Ebola , the healthcare landscape will change (Forrester *et al*., 2014, Stuckler *et al*., 2011). As such the infrastructure requirements will also change.

4.4 Other considerations to ensure a better financed healthcare in Africa

While this research did not seek to understand in depth issues surrounding healthcare as a sector, most of these factors cannot be divorced from finance and an understanding of the sector as a whole. The factors that were statistically significant include investments in human resources for health and weaning governments from relying on donor financing.

This factor was identified by PWC as a leapfrogging strategy for healthcare in India; where government investment in human resources for health has spurred growth in the sector, as the same entrepreneurs invested in healthcare. Perhaps this could serve as a catalytic investment by government that will spur growth in African healthcare infrastructure as is happening in India (McKinsey, 2012, Pradhan *et al*., 2011). Another mind-set shift that was needed was the reliance on donor resources to fund healthcare. Too many governments rely on donor resources such that there is no incremental benefit on investments made in healthcare, as most traditional donors respond in a humanitarian way.

The call is being made by some of the respondents;

"*….donor funding should be channelled not just to where the need is, but to what would bring the countries out of being basket cases*".

Other emerging markets such as India are relying not on donor grants but on capital markets to grow its healthcare sector. More research is needed on the conditions for which such a move becomes strategic, given the dependence for example of most HIV programmes on donor funding.

In conclusion, a diverse group of financiers were interviewed in this study. The initial results reflect that the majority of respondents from the survey were involved in financing healthcare infrastructure, and some were also involved in demand financing for healthcare operations.

The role of finance in healthcare generated much debate, for example on sequencing, which comes first, economic growth versus investing in healthcare. Seemingly this remains an ongoing debate with the responses from government representatives demonstrating the need to continue dialogue on these conversations. It is perhaps an area that warrants further research. The study was successful in identifying what the various sources of funding are, with an acknowledgement that the government should not be the sole funder of public health infrastructure projects, but instead create an enabling environment for other financiers to play a part. Governments' roles would be to deepen financial markets, improve the ease of doing business in Africa and facilitate specific investments in the sector. The role of private equity and donors was prominent from the financiers' perspectives with examples from the continent cited to demonstrate the growth of private sector involvement.

The study was also successful in identifying the various forms of financing infrastructure and their relevance gained from the in-depth interviews. While most were mentioned as possible financing mechanisms in Africa, they have not been tested and most are packaged as public-private partnerships. The success of the research is that financiers generally agree that most of these methods need to be accommodated, but perceive that the role of

government is to invest in catalytic assets that will then allow more of these financing mechanisms to be used.

Lastly, as relevant to any sector, factors that affect the investability of healthcare as a sector were explored, and resonated with the general views on what affects the ease of doing business in a country.

5 CONCLUSIONS AND RECOMMENDATIONS FOR FURTHER RESEARCH

"I ask no more of you than I ask of myself or of my children. …. Have courage, and you will find support. To the millions who are strong, I issue the plea: Set aside prejudice and politics to make room for compassion and sound policy."

Incept from Whispers of AIDS by Mary Fisher, author and AIDS activist, speaking on increasing funding for healthcare in Africa

Following decades of under-investment, gaps in Africa's healthcare infrastructure are obvious. In financing this gap, innovative ways of thinking are needed.

This study sought to understand perspectives of the financiers who are involved in financing healthcare infrastructure. Drawing from how other sectors are developing, and how other healthcare sectors in developed countries have developed, the report also draws on experiences of the financiers and tests the models identified against those from other fields and other countries. Largely left to the privy of government, healthcare as a sector has not developed to its full potential to address the various challenges presented by Africa's disease burden. The governments in Africa are challenged by the cumulative demands of sustained economic growth and have not kept up. Further, attracting private investors into the sector remains a challenge for several reasons highlighted in literature, mainly factors specific to the sector, such as the regulated nature of the healthcare sector, the difficulty of doing business in Africa and the nature of the capital markets in Africa.

The macro context in **Chapter 2** set a review platform for why infrastructure investments have not taken off in Africa, but little scholarly work has gone into analysing the trends in the healthcare infrastructure in Africa, a gap which this study was set to fill. Consequently, a phenomenological approach was used in the study as described in **Chapter 3**, where questionnaires were emailed to financiers, with a response rate of 43/100 identified as relevant in financing healthcare in Africa, the questionnaires deploying the Likert scale on what the most important considerations in financing are, followed by interviews to explore some of the issues in detail. This was done with six of the respondents to gain a richer perspective on the issues raised in the questionnaire.

5.1 Summary of findings

The findings, largely in line with what is found in literature, were adequately considered in explaining the seemingly perpetual underfunding of health systems in Africa. More importantly as set in the objectives of this research, newer models that have not been used at length in healthcare were further explored.

Finance was seen as key to growing healthcare infrastructure in Africa, and this relationship was seen to exist through finance's role in economic growth and vice versa. The dominant viewpoint was that when economic growth happens, demand financing through health insurance would deepen, and this would increase the supply of funds between as one funds infrastructure from capitation to operations.

The major sources of finance in Africa, based on evidence from literature, include government revenue, which is off balance sheet funding- and in some countries through donor funding. For most of Africa, the interplay between fiscal policies and political considerations seems to present an insurmountable obstacle to overcoming the burgeoning healthcare infrastructure crisis, but as this study shows the private sector is continually playing a role through public-private partnerships with evidence given by the respondents, and corresponding with the literature findings. Various innovative financing mechanisms are being discussed, with few being implemented.

Increasingly, private equity and venture capital is in the forefront of deals that involve healthcare in Africa, albeit within the private sector. However, exceptions are recorded in sectors such as biotechnology where deal structuring is key to private equity involvement.

This research project identified a number of funding sources for healthcare being used in Africa, including funding models for the financing of healthcare infrastructure projects of which four were seen to be relevant to financing healthcare in Africa. However, the classic public provision model of government planned, installed and financed infrastructure with pricing at marginal cost or on a loss-making basis – with returns recovered through the taxation system, continues to characterise much of Africa's publicly provided healthcare infrastructure. Despite this, development banks have a growing role in both public and private sector, private equity is increasingly influential in structuring deals in the private sector and the manner in which donors are involved in health has shifted from grants to expected returns in high impact investing. The dominant model of financing infrastructure is the public-private partnership even though most financiers saw the government retreating from being involved in these deals. Further innovation in healthcare infrastructure investment, including closing the gap between public and private-sector capital, is required as illustrated by respondents in this study.

5.2 Key takeaways

The report puts in place fresh thinking about the shift from governments being the sole and dominant healthcare infrastructure financier to opening the field to newer players, and offers new perspectives on how to structure financing.

- There is willingness to engage both private and public sectors in finance but as such platforms are far and few, it is recommended that development financiers and other institutions facilitate these conversations to a greater degree, with risk sharing models piloted across the continent.
- The role of government is shifting in healthcare infrastructure financing, with views that see this as crowding the private sector's involvement. Instead, governments should be involved only in catalytic asset financing rather than dominating both capitation and operations. However, the private sector can only be involved if there are incentives, particularly long-term incentives.
- Healthcare financing is a complex mix of pricing, access, public policy and regulation issues that result in complicated risk sharing endeavours. The government imperative on the social impact of investing in health is essential as it has introduced a further new dimension into the calculus of healthcare infrastructure provision. Any model of finance should take into account both the social and economic aspects of investing in healthcare infrastructure.
- An important dimension in the report was the continuum between capitation costs and operating costs. Given that existing healthcare infrastructure is also in disrepair, it is prudent that value is viewed not from the construction phase only, but is protracted beyond this phase. Increasingly, investors, in both the public and private sectors, are looking into these peculiarities for infrastructure financing. Reinforcing this continuum could enhance the asset value of healthcare infrastructure, and pave the way for newer models of financing such as leasing agreements, pay per use, build own and operate, etc. This would relieve the fiscal burden on the government and attract non-traditional players (such as venture capitalists) to projects. As respondents observed, this will ensure healthcare is not just a cost centre of the economy, but would generate returns that actually grow the economy because of finance's catalytic ability to unlock value in a sector.

- The role of government was viewed as crucial, in that as a regulator of healthcare, they could create an enabling investor environment in the sector, invest in those areas that would bring more entrepreneurs so as to attract more funding, and avoid crowding out the private sector when acting as both a regulator and a financier. Policy consistency in this regard was seen as important. This will ensures life cycle costing and the establishment of true user costs. This report examined the factors that affect investability for healthcare as a sector, and factors such as the weak recognition of the real estate value of the healthcare infrastructure, the highly regulated nature of the industry and the inherent risks that come not only with policy inconsistency but the lack of continuity on understanding the links between health capitation and operating costs.
- A reasonable transfer of risk to the public sector should be a minimum government requirement of any partnership with the private sector. It is suggested that government invests in improving the way of doing business in general but more importantly enables the private sector to play a prominent role while not denigrating its duties on ensuring equity and access in healthcare provision. In addition, more players from the private sector are encouraged to innovate and increase their willingness to partner with governments in creating long-term value in this asset class.
- While deal making processes are similar for several infrastructure projects, investing in healthcare infrastructure is for the long run, and recommendations are set in the paper on structuring finance such that there is payment model flexibility. The development of healthcare insurance and the call for governments and private sector to work together is a key finding, though not unique to healthcare as other studies have stated.

5.3 Recommendations for further research

1. **What is the actual funding gap for Africa's healthcare infrastructure?** This study was based on an assumption that there is a gap in healthcare infrastructure financing, but while estimates state that Africa has only 10% of the funding gap this gap has never been quantified in real dollar terms. As the infrastructure financing gap is set at 17 trillion dollars globally, it would be useful for governments in Africa to understand their infrastructure financing needs. Such a study could possibly use panel data which models disease patterns with the amount of infrastructure available in the public sector.

2. **What level of investment in healthcare is needed for a country to start seeing gains in economic growth?** This research question would determine, using lessons from other countries, what Africa realistically needs to invest in healthcare so that a) healthcare becomes a critical source of GDP growth; and b) so that the productivity gains from a healthy nation translate into economic growth. This question could be answered using a case study approach, collecting panel data from several countries and using a panel to provide an analysis of the relationship between investing in healthcare and the level of economic growth. In addition a deeper analysis on the type of healthcare investments needed would go a long way in helping policy makers make strategic decisions on healthcare investments.
3. **What is the utility of different structuring models of financing healthcare infrastructure?** While this study determined various structuring models for financing healthcare, most of them are untested in healthcare infrastructure projects. It would be useful for the field to pursue research that takes into account variables such as complex pricing and the social imperative that characterises healthcare.
4. **What innovative ways could donor financing be used to advance healthcare infrastructure in Africa?** Such a study would provide governments with guidance on how donor funding could best be channelled for strategic purposes that would be sustainable enough to start seeing gains in the health systems. Concepts have been suggested in literature, but country level studies are necessary as priorities are often determined by disease patterns, and the existing resource input into the healthcare systems.
5. **What business models could be advanced to improve investability of healthcare as a sector?** This question could be answered through testing various business models that are being used in other countries against some econometric variables that exist in healthcare to determine profitability.
6. **Testing various public-private partnership arrangements for Africa: Is there a best fit?** This question could either be a qualitative inquiry because the subject has not been studied at length or could be a technical analysis of the various models suggested by financiers in this paper on financing healthcare. Simulations from these models (for example subordinated debt), could be tested within several variables that form a PPP model and this could be run in an econometric format.

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