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INNOVATIVE FINANCING OF PUBLIC INFRASTRUCTURE IN ZIMBABWE: STATUS VS. POTENTIAL

Abstract

The paper examines the status and future potential of innovative finance in mitigating public infrastructure financing gaps in Zimbabwe. The study is descriptive. Data were collected through 23 interviews and 32 questionnaires. Interviews were conducted with managers of government of Zimbabwe ministries and parastatal enterprises, and the results were analyzed using thematic analysis. Whilst the questionnaires were distributed to officers of government of Zimbabwe ministries and parastatal enterprises and analyzed using Stata v14. The findings revealed that Zimbabwe does not currently finance public infrastructure using conventional innovative financing instruments. However, there are innovations in the combination of conventional financing instruments such as bonds, loans, and budget appropriations to finance power (electricity) infrastructure to a limited extent. Scope and potential exist for using innovative finance once a supportive legal and regulatory framework for public private partnerships (PPP) and other innovative financing instruments is in place in Zimbabwe. Using a binary logistic regression model, the findings showed that the infrastructure sector is the only factor significantly influencing innovative infrastructure financing at the 5% significance level with p-value < 0.05. The study recommends Zimbabwe to follow the South African Public Private Partnership framework by developing provincial and municipal regulations anchored in national legislation. There is latent potential for closing the public infrastructure financing gap in Zimbabwe using innovative finance.

Keywords

Zimbabwe, innovative finance, public infrastructure,
public private partnership, financing

JEL Classification

H54, H40, H27, O55

INTRODUCTION

Innovative finance entails collaboration between the private sector, non-profit organizations, and governments in merging private capital with public systems in a manner that promotes the common good, that is, the achievement of public objectives while making money for investors (Keohane & Madsbjerg, 2016). Innovative financing instruments that have been used to finance infrastructure include public private partnerships (PPPs), green bonds, social impact bonds, diaspora bonds, debt conversion development bonds, debt swaps, crowd-funding, revolving infrastructure funds and tax increment financing (O'Brien & Pike, 2015). However, the innovative financing instruments have been used to varied extents to finance public infrastructure in Africa.

Attracting the plenty of wealth under management by private sector, public sector entities and governments must ensure existence of a continuous flow of investible and bankable infrastructure projects (IDBZ, 2019a). Infrastructure projects requiring financing must be suitably documented and structured, have legal and economic recourse, and have robust rights of payments amongst many other features (Chua

et al., 2017). Several African countries face challenges in using innovative finance to mitigate their infrastructure financing gaps as noted by Badu et al. (2012) in Ghana and Mawejje and Munyambonera (2017) in Uganda. Some impediments to innovative financing of infrastructure include dearth in investment capacity, implementation, and revenue mobilization incapacities (Badu et al., 2012).

Infrastructure financing gaps are perennial, and countries should consider innovative financing solutions to such developmental challenges (Sandor et al., 2009). Challenges affecting the effective use of innovative finance are analogous for many sub-Sahara African countries, and therefore innovative finance has not contributed much to mitigating infrastructure financing gaps. The extent to which the Government of Zimbabwe and other public sector entities have used innovative finance for financing public infrastructure has not been widely recorded in literature, yet the financing gap has been consistently growing. Given the public infrastructure financing gap and the imminent resource constraints, it is imperative for the authors to assess the extent to which innovative finance has been used to finance public infrastructure in Zimbabwe and the potential of using innovative finance to mitigate financing gap in Zimbabwe. Hence, the purpose of this paper is to give an account of the status of innovative financing of public infrastructure in Zimbabwe with a view to ascertain the potential of mitigating Zimbabwe's infrastructure financing gap.

1. LITERATURE REVIEW AND HYPOTHESIS

Innovative financing mechanisms and their extent of usefulness in financing public infrastructure are reviewed hereunder. Literature observes that the predominantly used innovative financing instruments for public infrastructure financing is through public private partnerships (PPPs). Other innovative financing instruments are reviewed to draw lessons for Zimbabwe.

The concept of infrastructure financing is defined by Chan et al. (2009) as the actions associated with the obtaining and appropriation of financial resources required to implement investments in infrastructure projects. A closely related concept is funding, which refers to the source of financial resources necessary to repay the finance used in the project, which usually relies on either user charges/fees or taxes (Chan et al., 2009). Infrastructure like many non-current assets requires financing. Historically, infrastructure was financed privately during the Greek and Roman ancient empires, this changed in the twentieth century where there was an expansion of the public sector's role in financing and operating public infrastructure assets (Wagenvoort et al., 2010).

The concept of innovative finance entails a mixture of specifically designed instruments and practices for augmenting conventional approach-

es and sources of financing to achieve international development goals (Heinrich-Fernandes, 2019; Elmer et al., 2018; Mostafavi et al., 2014). Conventional approaches to financing public infrastructure such as government grants and budget appropriations funded from the fiscus are not enough to meet the financing needs for public infrastructure (Mostafavi et al., 2014). The magnitude of the financing challenges faced in Africa and other developing countries also outweighs the public and philanthropic resources allocated to these challenges (Tomalty, 2007). Hence, the need to be innovative in raising finance from novel and non-traditional sources and/or use of conventional financing mechanisms in new and innovative ways to address developmental challenges such as infrastructure requirements (World Bank, 2009).

Finance for the development and maintenance of public infrastructure in acceptable state have been observed to be a challenge for governments across the globe (United Nations, 2015; AfDB, 2015; ADB, 2017; WEF, 2014). As a result, the state of public infrastructure in most countries, including Zimbabwe, requires huge financial investments. Globally, between USD 3 trillion (WEF, 2014) and USD 6 trillion (Bhattacharya et al., 2015) is required for financing infrastructure, whilst developing countries require an estimated USD 1 trillion to USD 1.5 trillion (United Nations, 2015). Similarly, Zimbabwe must invest about USD 2 billion annually in public infrastructure, but all public sector

entities have consistently afforded about 20 percent of this requirement through budgetary appropriations (IDBZ, 2016; MoFED, 2018; IDBZ, 2019a).

Most governments cannot afford their infrastructure financing requirements, due to limitations in capacity in their fiscus (Peck, 2012; Hall & Jonas, 2014). Given the financial resources handicap of governments and the huge infrastructure financing gaps, governments and other public sector entities must develop bankable infrastructure projects that can attract private sector investors (IDBZ, 2019a). The public infrastructure financing landscape has significantly changed to either purely private financing or innovative financing from the conventional public sector financing. The infrastructure financing gap is a conundrum of 'lack in the middle of plenty' (Noman, 2017). The plenty is exhibited by the exponential growth in the wealth under management by savings institutions such as sovereign funds and institutional investors (Noman, 2017; Arezki et al., 2016).

It is essential to take advantage of the latent potential of using innovative financing approaches to catalyze more private capital towards investing in public infrastructure (Rillo & Ali, 2018). Notable innovative public infrastructure financing approaches entail public private partnerships (PPPs), credit enhancement tools, and novel special bond instruments amongst others (Mostafavi et al., 2021). The following sections review successes of some prominent innovative financing approaches to financing public infrastructure.

PPPs were firstly introduced in the United Kingdom in the early 1990s known as private finance initiatives (PFI) with the objective of harnessing private sector resources to finance public expenditure particularly public infrastructure investments (Wang, 2014). The purpose of introducing PFI was managing fiscal challenges faced by the government, when infrastructure requirements were increasing (Kang et al., 2019). PPPs are a risk-sharing and innovative financing mechanism that entails partnering together of a public sector entity and one or more private sector entities for purposes of providing public assets, or services or for engagement into projects conventionally provided by the public sector (Carbonara & Pellegrino, 2014). A PPP is therefore, a legally con-

stituted and recognized relationship between the parties whose tenure is either indefinite or specified during establishment (OECD, 2012).

PPPs have gained global prominence and sometimes have been termed a 'panacea' for closing infrastructure financing gaps due to their potential to unlock vast resources from private sector entities into public infrastructure financing (Byiers et al., 2016). PPPs have successfully financed public infrastructure in developed and developing countries (Chan, et al., 2009; Wang, 2014). Use of PPPs in public infrastructure financing is premised on the ability to leverage private financial resources, expertise in management and taking advantage of creative commercial skills (Ameyaw & Chan, 2015). PPPs require well-structured regulatory frameworks and monitoring and evaluation mechanisms to ensure goal congruency and adherence to agreed plans. Three cross cutting critical success factors for PPPs observed in transport infrastructure in Nigeria are central government participation by providing guarantees, obtaining political support and economic feasibility of the project (Babatunde & Perera, 2017).

Many developing countries such as Zimbabwe fail to attract substantial PPP investments due to a lack of bankable projects that are coupled with high sovereign risk. There are relatively more failed PPPs in developing countries, attributed to decision-making illusions in the selection of PPPs (McQuaid, 2019). PPP decision making is hampered by efficiency, costs of financing, proclivity to share risks, the processes involved in the procurement and related transaction costs, and broader effects on the economy amongst many other factors (McQuaid, 2019). As a result, PPP risks must be aptly analyzed and shared between the partners based on their ability to deal with allocated risks (Ibrahim et al., 2006). Moreover, implementation of PPPs for infrastructure financing requires vigorous and clear systems to regulate and govern their implementation, including proper accounting and reporting structures (McQuaid, 2019). Without these PPPs, a significant reduction in the infrastructure financing gap in Zimbabwe cannot be expected.

Diaspora bonds and remittances are also an important source of innovative finance for investments in public infrastructure. More than 215 mil-

lion people are estimated to have left their countries of origin (COO) due to a variety of factors, majority of them coming from developing countries with about 160 million estimated to be from Africa (Mugano, 2018). Given the growth in diaspora, countries have resorted to developing innovative financing instruments to capture the financial muscle of the diaspora to develop the COO, in addition to remittances (Goodfellow, 2020). One of the instruments is revenue bonds issued to the diaspora community called diaspora revenue bonds (Boamah et al., 2017). Several countries, including Israel, India, and Ghana, have issued diaspora bonds. Ethiopia is also financed construction of the Grand Ethiopian Renaissance Dam through issuing bonds to Ethiopians in the diaspora (Tawfik, 2016).

On the other hand, diaspora remittances to developing countries have been significantly growing from about USD 164 billion in 2004–2005 to about USD 308 billion in 2008 (Ratha & Plaza, 2011), and eventually reached USD 406 billion in 2012 (Mishra, 2016). The World Bank reported remittances to sub-Saharan Africa (SSA) having grown from USD 23.5 billion in 2006 to about USD 34.8 billion in 2015, an amount comparable to the total foreign direct investments into the SSA region (Mugano, 2018). These amounts do not include unofficial remittances, which are estimated to average an additional 45% to 65% of officially recorded remittances (Gupta et al., 2009). However, diaspora bonds and remittances remain underutilized by developing countries for purposes of development in COO, especially for investment in national capital assets such as public infrastructure (Boamah et al., 2017). Zimbabwe has a relatively huge diaspora, but most of the migrants are political emigrants who are unlikely to contribute to issues of diaspora bonds by the Government of Zimbabwe. Therefore, remittances remain the main finance accessible from Zimbabwe's diaspora. Other innovative source of public infrastructure finance recorded in literature includes the following:

a) Social Impact Bonds (SIBs), that is, technically not bonds but an outsourcing arrangement of the financing, planning, and evaluation of the provision of social services that is financially beneficial to private sector investors if objectives are met (Chamaki et al., 2019).

b) Crowdfunding, defined by the European Commission as: "... an emerging source of financing involving open calls to the public, generally via the internet, to finance projects through donations, monetary contributions in exchange for a reward, product pre-ordering, lending, or investment" (European Commission, 2015). This has primarily been used to finance renewable energy generation infrastructure (Miller et al., 2018).

There are many other innovative infrastructure financing instruments used in developed countries that include green infrastructure bonds, tax increment financing, and state infrastructure banks (Elmer et al., 2018).

Given the variety of innovative financing instruments discussed in the literature, the aim of the study was to assess the status of the use of innovative finance in the development of public infrastructure and, therefore, evaluating the potential of using innovative finance to alleviate the infrastructure financing gap in Zimbabwe. The authors' hypothesis is as follows:

H_0 : *There is a significant innovative financing of public infrastructure in Zimbabwe.*

2. RESULTS

This section presents results obtained from questionnaires and documentary analysis. Firstly, demographic information of study participants is presented in Table 1.

Table 1. Respondents' demographic information ($n = 55$)

Source: Primary data (2020).

Gender	Male		Female		
Frequency	42		13		
Education	Diploma	Undergraduate degree	Postgraduate degree		
Frequency	7	33	15		
Position held	Director	Deputy director	Senior manager	Manager	
Frequency	22	7	11	15	

As shown in Table 1, most participants (42/55) were males, whilst only 13/55 were females. Most participants (33/55) held undergraduate degrees followed by postgraduate degree holders (15/55) and 7/55 held diplomas. 22/55 were directors, 15/55 were managers, 11/55 were senior managers, and 7/55 were deputy directors. All participants in the study actively participated in the financing of infrastructure due to their positions in their organizations. This was important for purposes of ensuring credibility of findings.

Questionnaire respondents were asked on the financing mechanisms used on selected infrastructure developed during the period under study, and the results are presented in Table 2.

Table 2. Sources of finance for public infrastructure

Source: Primary data (2020).

Source of finance	Frequency	Percent
Innovative	7	21.88
Conventional	25	78.13
Total	32	100.00

Table 2 shows that about 22 percent of infrastructure projects were financed using some innovative finance. As noted in the literature reviewed earlier in the paper, the most used innovative financing mechanism in financing infrastructure is PPPs, but in Zimbabwe there are no PPPs. Therefore, the potential of innovative finance in closing the public infrastructure financing gap in Zimbabwe is based on the interpretation based on the variety of definitions available in the literature, some of which have been highlighted earlier in the paper, in the Introduction and Literature review sections. The results are presented for each of the four infrastructure sectors highlighted in the Methodology section.

Questionnaires, interviews, and documentary analysis showed that transport infrastructure in Zimbabwe is financed by the government through budget appropriations and bilateral loans from the Chinese Government. Budget appropriations financed road and bridge construction, whilst the maintenance of road was financed from the Road Fund established by the Roads Act (Chapter 13:18), which established the Zimbabwe National Road Administration (ZINARA). This was confirmed by interviewees, for instance, interviewee T1 said,

“The mandate of ZINARA is mainly on the rehabilitation and maintenance of the roads. They are not really involved in the construction of new roads. For construction of new roads, we normally get funding from the MoFED, although they also finance rehabilitation of existing roads.”

Airport infrastructure was financed through the Chinese government’s bilateral loans advanced through the China Export Import (Exim) Bank.

One of the key informants from the International Monetary Fund’s Zimbabwe country office noted:

“The main reason why we don’t have meaningful PPPs is because of risk. Look at what has happened to the currency situation today, in relation to the exchange rate management situation...”

Zimbabwe has high political risk anchored in policy inconsistencies, and government policies are unfavorable to private sector investments. This has resulted in Zimbabwe failing to attract innovative finance for public infrastructure development.

Using data collected through questionnaires, the factors that contributed to the use of innovative finance in Zimbabwe were assessed using a binary logistic regression. Firstly, reliability of the questionnaire was assessed using the Cronbach alpha (Table 3).

Table 3. Reliability statistics

Source: Primary data (2020).

Cronbach’s Alpha	Number of Items
0.702	16

The Cronbach alpha presented in Table 3 shows the questionnaire was reliable because it exceeded the recommended minimum of 0.7. Logistic regression results are presented in Table 4.

As shown in Table 4, the infrastructure sector significantly influenced the use of innovative finance at the 5% significance level with p-value < 0.05. Project risk, transaction cost risk and information asymmetry risk were insignificant.

Based on results presented in Table 2, whereby only, 21.88 percent of public infrastructure projects done in Zimbabwe between 2010 and 2019 were fi-

Table 4. Logistic regression results

Source: Primary data (2020).

Logistic regression		LR chi2(4) = 11.26				
Log likelihood = -11.177917		Prob > chi2 = 0.0237				
		Pseudo R2 = 0.3351				
Finance	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
Sector	0.2636945	0.165306	-2.13	0.033	0.0771785	0.9009612
Project_Risk	0.2706158	.2643072	-1.34	0.181	0.039902	1.835318
Transaction_Cost_Risk	3.885118	3.771533	1.40	0.162	0.5795466	26.04475
Information_Asymmetry_Risk	8.311784	11.11295	1.58	0.113	0.6048232	114.2247
_cons	0.0745409	.3280476	-0.59	0.555	0.0000134	415.3865

Note: _cons estimates baseline odds.

nanced through innovative finance. Therefore, the hypothesis presented above is not accepted. Thus, the authors concur with the assertions in the literature that highlight the poor usage of innovative finance in the SSA region.

3. DISCUSSION

Literature records that there is no common definition of the concept of innovative finance, it broadly entails public sector entities integrating private capital with public sector systems for the purpose of financing global challenges in a cost-effective way that is mutually beneficial to all players involved but most importantly giving acceptable returns on investment to private sector investors (Keohane & Madsbjerg, 2016). Innovative finance, therefore, is a source of finance complementing the conventional sources of finance for development and it is also a way of linking financing to results, thus, redistributing risk, using technology, enhancing working capital availability, and enhancing efficiency and effectiveness of finance (Elmer et al., 2018).

As a result, no innovative financing mechanisms were used to finance transport infrastructure in Zimbabwe, despite interviewees highlighting the refurbishment of the road from Plumtree to Mutare via Harare as having been financed through a PPP. The road project was financed through a loan but delivered/implemented through a PPP. This confusion was not unique to this study's participants as the literature recognizes that the concepts of financing, funding, and delivery in relation to infrastructure were commonly confused because of their intricate relationship (Henn, 2015).

However, PPPs have been used successfully in financing transport infrastructure in several developing countries after their success in developed countries (Olusola & Perera, 2017; Osei-Kyei & Chan, 2016). Some African countries that have successfully used PPPs to finance transport infrastructure include South Africa and Nigeria (Osei-Kyei & Chan, 2016). The inability to attract innovative finance into the transport infrastructure sector warranted further enquiry and interviews showed a weak framework for the implementation of PPPs and for risk management.

Financing of power/energy infrastructure development in Zimbabwe has been through bilateral loans from the China Exim Bank, infrastructure bonds, commercial loans, development assistance grants, and treasury/budget appropriations. There are also private sector companies that invested in electricity generation infrastructure (renewable energy) (IDBZ, 2019b). Most of the financing came from the China Exim Bank, but to mitigate risk, the loans had co-financing preconditions, which were financed by issuing infrastructure development bonds through the Infrastructure Development Bank of Zimbabwe (IDBZ) and/or commercial loans. Commercial loans were obtained from the Standard Bank of South Africa and were secured through a power purchase agreement between Namibian Power Company and the Zimbabwe Power Company. Development grants from the ZIMFUND, a multi-donor emergency trust fund, were also used to finance the emergency refurbishment of power generation units at Hwange thermal power station (The Standard, 2020).

Instruments defined in literature as innovative finance were not used to finance power infrastructure.

However, an examination of the combination of the various financing instruments showed innovations in the manner they were combined to achieve financing requirements of developing power infrastructure. Innovation in using conventional financing instruments is regarded to be innovative finance by the OECD (Sandor et al., 2009).

However, power infrastructure attracted the largest private sector and innovative finance when compared to other economic infrastructure sectors in Africa as highlighted by the African Development Bank. It attracted 11 out of the 17 PPP deals concluded in Africa in 2016 (AfDB, 2018). However, there is still a need for more private sector and innovative financing of power infrastructure in Zimbabwe and other countries in the SSA region, since it is the electricity-poorest region of the world (ACBF, 2016), with an average of just above sixty percent of the population having access to electricity (World Bank, 2017).

Water and sanitation infrastructure in Zimbabwe was financed from the government's treasury through the public sector investment program (PSIP), for constructing dams. Potable water supply infrastructure in towns and cities was financed from a combination of China Exim Bank bilateral loans, budget appropriations and development assistance grants. Treasury financed the construction of all dams and water and sewerage expansion and refurbishment infrastructure in most of towns and cities across Zimbabwe. Water and sewerage reticulation infrastructure in the City of Harare was financed through a loan from the China Exim Bank. Two multi-donor trust funds, the ZIMFUND by the African Development Bank (The Standard, 2020) and ZIMREF by the World Bank, financed water infrastructure in cities, towns, and growth points (World Bank, 2020). The trust funds were created in response to outbreaks of waterborne diseases, cholera and typhoid in town and cities in Zimbabwe.

An examination of the financing arrangements for water and sanitation infrastructure by the

multi-donor trust funds also shows process innovation since donors are not cooperating with Zimbabwe due to political challenges. The trust funds are for longer timeframes hence meeting the requirement for innovative finance to be availed on a multi-year basis and transferring resources to Zimbabwe, a developing country to mitigate humanitarian crises caused by poor access to potable water (Sandor, et al., 2009). However, the amounts availed by the multi-donor trust funds are negligible.

To make water infrastructure attractive to private sector financiers, creativity and innovation are necessary through constructing waterbodies such as dams in strategic locations where hydro-electricity generation plants can be developed (Salman, 2016). An example being the Grand Ethiopian Renaissance Dam, which was mainly financed using innovative finance, that is, the Ethiopian diaspora subscribing to bonds issued by the Ethiopian government and crowdfunding from local Ethiopians who were convinced to invest part of their income into the project (Tawfik, 2016). For Zimbabwe to attract innovative finance into water infrastructure, it requires construction of dams with downstream economic activity from which the investors can get acceptable returns on their investments (Keohane & Madsbjerg, 2016).

Provision of ICT infrastructure in Zimbabwe is dominated by the private sector companies with the public sector being market followers. Given the presence of private and public sector entities in this infrastructure sector, it is possible and ideal to combine the private sector resources and the public systems to enhance efficiency in the provision of ICT services. However, no ICT infrastructure was financed using innovative finance. ICT infrastructure controlled by the public sector was financed using treasury resources, retention funds and/or bilateral loans from the China Exim Bank, whilst private players have accessed financing from commercial loans both onshore and offshore.

CONCLUSION

The aim of the study was to assess the current status and potential of using innovative finance for development and closing the public infrastructure financing gap in Zimbabwe. The results of interviews and questionnaires showed that there is limited use of innovative finance for financing public infrastructure

in Zimbabwe. Using a logistic regression model, only the infrastructure sector was found to significantly influence the use of innovative finance in public infrastructure.

The results also showed that no infrastructure in the transport, energy, information and communication technology, or water and sanitation were financed through conventional innovative finance. However, there was innovation in the use of conventional financing instruments in financing power infrastructure, which, according to the OECD, is a form of innovative finance. There was also innovation through the use of infrastructure development bonds, a form of project finance rather than corporate finance, since power utilities were technically insolvent and, therefore, could not attract corporate finance but the projects were viable. The study revealed some of the reasons for the lack of innovative finance in Zimbabwe, including high sovereign and political risk caused by a weak investment protection policy framework, key being the currency management policy, which escalated the infrastructure and long-term financing risk in Zimbabwe.

The authors recommend that Zimbabwe's Investment and Development Agency Act (Chapter 14:37) be operationalized and its implementation must be supported by suitable policies. This Act was enacted with a view to centralize and quicken processing of investment proposals, especially for foreign investors. This ensures a wider pool of private capital, which, if supported by bankable infrastructure projects, can lead to more innovative financing and private sector financing of public infrastructure. Given the success in using PPPs for financing public infrastructure, especially in the transport sector in other developing countries, the Government of Zimbabwe should ensure there is a supporting framework for attracting and implementing PPPs. Lessons can be drawn from the experience of South Africa, where there is a clearly defined PPP framework from the national government to the provincial and municipal levels. This can help in attracting PPPs in various infrastructure sectors in Zimbabwe.

AUTHOR CONTRIBUTIONS

Conceptualization: Tonderai Kapesa, Gift Mugano, Houdini Fourie.

Data curation: Tonderai Kapesa.

Formal analysis: Tonderai Kapesa, Gift Mugano.

Investigation: Tonderai Kapesa.

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Supervision: Gift Mugano, Houdini Fourie.

Validation: Gift Mugano, Houdini Fourie.

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Writing – review & editing: Gift Mugano, Houdini Fourie.

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