An investigation into the use of land-based financing to fund infrastructure in South Africa

Robert McGaffin, Francois Viruly and Luke Boyle
Urban Real Estate Research Unit,
University of Cape Town, Cape Town, South Africa

Received 6 February 2019
Revised 28 June 2019
12 August 2019
Accepted 13 September 2019

Abstract

Purpose – The purpose of this paper is to understand how the nature of infrastructure as a public good has traditionally lent itself to state provision and to review how land-based financing (LBF) can be used to overcome the public infrastructure funding constraints in South Africa.
Design/methodology/approach – The paper is largely based on a review and analysis of the academic literature, government reports and reports from research institutions such as the World Bank, Department for International Development, Urban Land Institute and the Lincoln Institute.
Findings – The paper finds that although a number of LBF instruments are being used in South Africa, the majority of them are not suited to addressing the current infrastructure funding constraint. However, the paper finds that some LBF mechanisms, such as tax-increment financing (TIF), that are currently not used could play a role provided that certain preconditions are met.
Research limitations/implications – LBF has only partially been implemented in South Africa, thus the paper is limited to exploring the issues, challenges and necessary policy and regulatory changes needed to support LBF.
Practical implications – The review of LBF mechanisms currently being used in South Africa highlights many of their practical limitations. Furthermore, concrete proposals and legislative amendments are proposed in the paper regarding the implementation of additional funding instruments such as TIF.
Social implications – Infrastructure is regarded as a key precondition for socio-economic development. LBF offers a viable and important alternative for fiscally constraint governments in emerging economies to fund infrastructure provision.
Originality/value – The main contribution of the paper is its focus on the use of LBF in the under-researched Sub-Saharan African context.

Keywords South Africa, Infrastructure investment, Land-based financing, Tax-increment financing, Urban infrastructure, Value capture

Paper type Conceptual paper

1. Introduction

Infrastructure is seen globally as a key factor in driving economic growth and reducing poverty and inequality (Fedderke and Garlick, 2008; Brown-Luthango, 2011; Chitiga *et al.*, 2016; The African Development Bank Group, 2018; Foster, 2008; International Monetary Fund, 2017; World Bank, 2017). In South Africa, research has similarly shown that there is a strong correlation between infrastructure investment and economic growth (Coetzee and Kleynhans, 2017) and that infrastructure investment is needed to restructure its inequitable, inefficient, unsustainable and fiscally unviable cities (Fedderke *et al.*, 2006; The African Development Bank Group, 2018).

Infrastructure is generally seen as a capital good or service that supports the production of private and public goods (Frischmann, 2004). It is often termed social overhead capital because it provides services for society (Hirschman, 1958; Buhr, 2003; Frischmann, 2004; Fourie, 2006; Fedderke and Garlick, 2008). There are two main categories of infrastructure: economic and social. Economic infrastructure refers to resources such as roads, railways, telecommunications and electricity grids that promote economic activity (Fourie, 2006). Social infrastructure refers to resources that promote health, education and cultural development (Development Bank of Southern Africa, 1998). For the purpose of this paper,

Journal of Property Investment & Finance

1463-578X
DOI 10.1108/JPIF-02-2019-0016

infrastructure refers to the basic physical goods, services and facilities needed for the operation of social and economic activity.

Fedderke and Garlick (2008), Agénor (2010) and The African Development Bank Group (2018) argue that there has been insufficient infrastructure investment in South Africa. Although the 2012 National Development Plan of South Africa identifies that annual public infrastructure investment equivalent to 10 per cent of its Gross Domestic Product is required to address the developmental challenges of the country, the South African National Treasury 2019 Budget Review showed that such investment has averaged around 5 per cent per annum between 1994 and 2018 (Republic of South Africa, 2012 and 2019).

One of the main reasons for this is the fiscal constraints to fund such infrastructure (South African Cities Network, 2016; International Monetary Fund, 2017; Republic of South Africa, 2019). As a result, there has been an increasing interest in identifying alternative ways, in particular land-based financing (LBF), to fund infrastructure development in the country (Brown-Luthango, 2011).

The use of LBF to finance infrastructure and urban development has been widely researched (Cervero and Susantono, 1999; Cervero and Murakami, 2009; Debrezion *et al.*, 2007; Du and Mulley, 2007; Hui *et al.*, 2004; Huxley, 2009; Ingram and Hong, 2011; Medda, 2012; Peterson, 2008; RICS, 2002; Rodriguez and Mojica, 2008; Smolka and Amborski, 2000; Suzuki *et al.*, 2015). However, this research has tended to focus on Europe, the USA, South America and Asia, with little attention paid to its use in a Sub-Saharan African context. Furthermore, the literature has tended to focus on the need for, and justification of, the use of LBF to finance infrastructure and has paid limited attention as to why the state has traditionally funded and supplied infrastructure as a public good.

The purpose of this paper is, therefore, to address these shortcomings by first, explaining that the characteristics of infrastructure as a public good has traditionally lent itself to state provision and second, to review the potential and challenges of using LBF to fund infrastructure in a specific Sub-Saharan African context. However, as LBF has only partially been implemented in South Africa, the paper is limited to exploring the issues, challenges and necessary policy and regulatory changes needed to make LBF a reality. The paper does this by:

- explaining why governments traditionally fund infrastructure development;
- outlining why this model of infrastructure provision is increasingly under threat in South Africa;
- Illustrating the theoretical justification for LBF mechanisms; and
- identifying which LBF mechanisms are currently in use and which additional LBF mechanisms, such as tax-increment financing, could be used in South Africa.

2. Why the state has traditionally been the main provider of infrastructure

Although an increase in public private partnerships and the inclusion of infrastructure as an investment asset class (Finkenzeller *et al.*, 2010) has seen a growth in the role of the private sector in the delivery of infrastructure, the state has conventionally been the main supplier of infrastructure to date. This is largely due to the defining characteristics of infrastructure and the consequent failure of the market to supply it adequately (Black *et al.*, 2008).

The market, through the price mechanism, is relatively successful at bringing about a Pareto optimal state – where there is an allocative and productive efficient outcome. This is particularly the case in the long run and is dependent on producers and consumers being able, and willing, to reveal their true demand (price) for a good or service (Glahe and Lee, 1989; Black *et al.*, 2008). This generally occurs when markets are competitive and efficient.

However, in many cases, even for private goods (defined as those goods that are rival and excludable[1]), this does not occur, and the market fails to produce a Pareto optimal state by undersupplying certain markets.

The reasons for this are that first, markets are often inefficient due to poor information, high barriers to entry and exit and high transaction costs, which prevent producers and consumers from adjusting their behaviour to reflect changing conditions. Second, there are often delays in adjustments for technical and logistical reasons, and third, the uneven distribution of income can also undermine the competitive bidding for goods and services (Black *et al.*, 2008).

Markets can also be incomplete and uncompetitive, which may lead to the under-provision of goods and services by the market (Harvey and Jowsey, 2004). Incomplete markets exist when public goods, externalities and merit goods exist (Black *et al.*, 2008). Public goods or community goods, such as street lights, are non-divisible and hence non-rival and non-excludable (Harvey and Jowsey, 2004; Medda, 2012). As a result, the use by one party of a good or service does not create scarcity of the good or service for another user and hence this user will not pay (bid) for the right to receive this utility, resulting in a "free-rider" problem (Grimsey and Lewis, 2007; Black *et al.*, 2008).

Externalities also lead to incomplete markets as true prices are not revealed as the full costs and benefits do not accrue to the producer or consumer of a good or service and they will, therefore, not fully pay for them (Steinmueller, 1996; Black *et al.*, 2008). This often occurs with merit goods or services, where the benefits of the provision of a particular good or service, such as education, extends beyond the individual user to the broader society. As the individual does not receive the full benefit, he or she will not pay the required price to generate the output demanded by society. The consequence of community goods, externalities and merit goods is that their true demand is not revealed through the price mechanism and as a result the market will usually under provide them, if at all (Black *et al.*, 2008).

In many cases, markets can be uncompetitive as well (Glahe and Lee, 1989). Under circumstances of increasing returns to scale, monopoly provision occurs (Glahe and Lee, 1989; Black *et al.*, 2008). Conditions of increasing returns to scale are common in goods and services that require large capital investment and economies of scale and hence the need to be consumed collectively, e.g. a city water system. The large consumer thresholds needed to make their provision viable means that a market (e.g. a city) can usually only support a limited number of suppliers (resulting in a monopoly) (Frischmann, 2004; Fourie, 2006; Grimsey and Lewis, 2007). As these monopoly suppliers are price makers, their marginal revenue will be lower than the price paid by the market, and as a result, a lower quantum will be produced at a higher price than in a competitive market (Glahe and Lee, 1989; Black *et al.*, 2008). In addition, due to the large capital outlays involved, investment in such projects require very long payback periods (often inter-generational), and tend to benefit from economies of scale which is a further disincentive to private investment in such schemes (Harvey and Jowsey, 2004).

In the case when these uncompetitive markets produce merit goods or services, further under-provision may occur. This is due to the fact that the individual does not receive the full benefits of a merit good or service and will, therefore, "underprice" it and the fact that such goods or services often have high unit costs results in the average cost being greater than the revenue generated (Glahe and Lee, 1989). As a result, the supplier would need to be compensated (subsidised) for the difference (loss made) between the price paid and the average cost to produce the good or service at an optimal level of output (Black *et al.*, 2008). As the optimal provision of such a good or service is seen as beneficial to society and the state can draw on alternative revenue sources to fund the compensation required, it is often argued that the state is best placed to provide such goods or services (Black *et al.*, 2008).

In summary, the private sector will often not provide infrastructure at the optimal level or price to maximise societal welfare due to market inefficiencies, technical delays, uneven income distribution and uncompetitive and incomplete markets. Consequently, the state has historically been the dominant provider of infrastructure (Visser and Erasmus, 2002). However, due to declining revenue sources and competing and growing expenditure demands, this public delivery model is similarly not providing infrastructure at the requisite levels in South Africa.

3. Challenges faced by the state in providing infrastructure in South Africa

3.1 Declining revenue sources

The South African Cities Network (2011, 2015, 2016) outlines how municipalities are broadly funded from their own revenue sources and national transfers (equitable share and grants). Own revenue sources include service charges (e.g. water, electricity, etc.), property taxes, borrowings (e.g. municipal bonds, etc.) and the share of the fuel levy and fines.

National transfers to provinces and municipalities are based on their respective functions and responsibilities stipulated in the Division of Revenue Act and take the form of the equitable share transfer and various conditional grants. The amount of the equitable share received by a municipality is based on their size and the developmental challenges they need to address. The intention is that this revenue pays for services to poor households and that non-poor residents are funded through revenues collected from property rates and service charges. Conditional grants fund specified items such as transport and housing, and municipalities must meet certain criteria to receive them.

However, the ability of national government to fund municipalities through national transfers is being constrained by declining national revenue collection as a consequence of low economic growth, declining commodity prices and lower tax collection. In certain cases, expenditure on infrastructure is reduced to meet urgent short-term socio-economic objectives. As a result, the rise in infrastructure expenditure since the economic crisis in 2008 has been sustained by an ever-increasing dependence on debt, which is a concerning trend in a low growth environment like South Africa where debt service costs are becoming one of the fastest growing expenditure items on the national budget (Republic of South Africa, 2017). In response to this, the national government is attempting to stabilise the growth of debt as a share of GDP by reducing expenditure, which includes reducing transfers to local government. As a result, there is increasing pressure on municipalities to generate revenue from local sources (South African Cities Network, 2016). However, the generation of local revenue is curtailed for the following reasons.

First, revenue from utilities is declining because of improved household efficiencies (e.g. reduced water and electricity consumption). Second, revenue collection and expenditure are governed by a complex legal framework that includes regulations governing municipal rates, levies and surcharges, and how municipalities borrow for capital or operating expenditure (Hickey-Tshangana, 2011). Third, although a number of local revenue mechanisms (such as property rates and development charges) are well-entrenched in the municipal finance system, they are often implemented in an *ad hoc*, inconsistent and inadequate manner (Savage, 2009). Fourth, a significant percentage of locally generated revenue is earned directly through their property rates base, or indirectly by borrowing on the back of their property rates base from property taxes. However, this base is vulnerable to the performance of local property markets, which have performed relatively poorly on the back of low economic growth (Santos *et al.*, 2016). Last, in some cases, municipalities and state-owned entities have reached their "general obligation" borrowing limits, which they cannot exceed without potentially negatively impacting their credit rating and cost of capital (Savage, 2009; South African Cities Network, 2016).

3.2 Competing expenditure demands

Municipalities not only face revenue constraints, they also face rising operating and capital expenditure challenges (South African Cities Network, 2011, 2015, 2016). Operating expenditure is related to costs associated with running a city. This includes, amongst others, bulk purchases (e.g. water and electricity), employee-related costs and repairs and maintenance. The operating budget is largely funded by internal sources of revenue, such as property rates and service charges (Hickey-Tshangana, 2011). These operating expenses have increased significantly due to increased bulk electricity costs and employee costs. As a result, cities have not been able to allocate adequate funds towards repairs and maintenance of existing infrastructure, which is likely to lead to further capital costs in the medium term (South African Cities Network, 2011, 2015, 2016).

Capital expenditure includes the provision of new infrastructure such as roads, water, electricity and sewerage systems, and is funded from national and provincial transfers, internally generated revenue, and municipal borrowing. The challenge that municipalities face is that they need to balance the above expenditure to meet multiple objectives, including: stimulating economic growth; addressing the historical under-provision of infrastructure in marginalised areas; accommodating rapid urbanisation; addressing spatial inefficiencies; and maintaining existing infrastructure systems (McGaffin *et al.*, 2014). This balance needs to occur in an environment where certain functions, with respect to housing and transport, are being devolved to municipalities without the commensurate funding (South African Cities Network, 2016).

As a result, in the context of the above threats to the current infrastructure funding model, questions have been asked as to whether LBF instruments should be used to a greater degree to finance infrastructure at a local level (Brown-Luthango, 2011; McGaffin *et al.*, 2014; Santos *et al.*, 2016; Berrisford *et al.*, 2018).

4. Land-based financing

LBF is a broad category of financing that is directly linked to the development and management of land and its associated value (Santos *et al.*, 2016; Berrisford *et al.*, 2018). Broadly, all LBF mechanisms use an increase in land value to directly or indirectly pay for goods and services that are generally of a community or collective nature, or second, to redistribute wealth in society. When the cost-benefit relationship is more direct, the objective of the mechanism tends to be one of cost recovery vs wealth redistribution when it is less direct. Therefore, all LBF is a form of value capture where increased property values are captured to fund some public good or service (Hui *et al.*, 2004). However, a distinction is made between those LBF mechanisms that directly recoup the costs from beneficiaries that benefit directly from some specific public investment and those mechanisms that capture value not directly associated with the costs of public investment and which is distributed to broader society.

4.1 Justification for the use of LBF

Property values are derived from two sources, namely the improvements on a property and the land on which the property is located (Medda, 2012). In terms of the former, the value is a function of market dynamics, the nature of the improvements, the location decision made by users and it reflects the highest and best use of the land, namely what is physically, functionally and financially possible. This value is generally the result of the investment, expertise, risk taking and efforts of the developer and user of the land and their ability to respond to market conditions.

The latter land value, as Ricardo (1817) states, is determined by its unique attributes and its attributes relative to other properties. These attributes create a scarcity and differential value, which enables a producer surplus or economic profit to be generated. This surplus

value over and above what is needed to ensure its continued production is commonly captured by the landowner in the form of economic rent (Ricardo, 1817; Smith, 1776). Importantly, unlike the improvements on the land, it is argued that these attributes are not the result of the efforts of the landowner and are often as a result of natural occurrences and broader public and private investment. As Zhao *et al.* (2012, p. 436) state, "The price of land tends to capitalize the value of many types of public goods […]".

The taxation of land is theoretically sound because it is less distortionary than many other forms of taxation and it has a strong base due to land's fixed nature and generally inelastic supply (Hui *et al.*, 2004; Zhao *et al.*, 2012). However, from a policy perspective, the question of how land value is distributed has generated significant debate. In this debate, the distinction is often made between value created by the developer or property investor (who has erected a building) and the value that landlords are able to secure through economic rent. While there seems to be an agreement that the investor, who had developed a property, should be appropriately compensated for the risk taken, differences exist regarding the right of the landlord to capture economic rent as it is, to a large degree, created by a broader public and private investment which society has a right to recuperate through taxation. Henry George (1879), a strong proponent of land value taxation, argues the case as follows:

> Consider what rent is. It does not arise spontaneously from land; it is due to nothing that the landowners have done. It represents a value created by the whole community […] rent is the creation of the whole community, necessarily belongs to the whole community. (p. 166)

Consequently, as the (producer) surplus from which economic rent can be extracted is the result of public and other private parties' investment and efforts, this rent should accrue to the state so that it can be reinvested in the broader public realm. Furthermore, due to the fact that first, the economic rent is an amount over and above that needed to incentivise the landlord to bring it to the market, and second, a developer would be indifferent as to who the economic rent is paid to, the capture of some of the economic rent by the state should not have any distortionary effects. Or as Henry George (1879) put it: "Would not all this land be cultivated and improved just as well if the rent went to the state or municipality, as now when it goes to individuals?" (p. 159).

However, the value that is created by public investment is a function of how a landowner responds to the potential, the market conditions and the development processes involved. Furthermore, the ability of society to capture the increased land value is influenced by the characteristics of land markets, the amount of economic rent that has been created, as well as the elasticity of demand and supply. These land market characteristics will also determine the extent of the distortions which a land tax regime may create. Therefore, in theory whilst it is tempting to differentiate between value created by a developer and society, in reality it is difficult to determine the causes and level of economic rent in land markets (Santos *et al.*, 2016). Furthermore, the successful use of LBF is dependent on a number of preconditions, particularly relating to the elasticity of the market, being in place.

4.2 Preconditions for the use of LBF mechanisms

The ability to fund public expenditure through LBF is largely dependent on how it functions as a form of taxation. The efficiency and characteristics of a tax regime is determined by the tax incidence (who pays the tax), the ability of taxpayers to circumvent a tax, and the economic distortions that a tax or tax regime creates (Hui *et al.*, 2004). The incidence of a tax is influenced by the elasticity of supply and demand of goods and services. The lower the price elasticity of supply and demand, the lower the possibility exists to shift the incidence of tax from the supplier to the consumer.

The supply of land tends to be inelastic as land at a location cannot be altered by an increase in price, especially where town planning regulations reduce the ability of bringing additional land and floor space to the market. If the price elasticity of land supply is zero, the impact of a tax will not have any impact in altering the supply of land and the landowner would need to absorb the entire tax. The price elasticity of demand similarly tends to be low considering that users often deal with few location alternatives. It is also influenced by the share of land in total development costs – when land plays an important part in the total value of a development, developers will be more sensitive to land price changes (Needham, 2000).

Higher price elasticities, however, can lead to the circumvention of tax payment as users and suppliers of land can reduce taxes by diverting activities to land parcels that attract lower tax rates. This, in turn, can create economic distortions by reducing the supply of required land and uses in certain locations. Therefore, if the intention of a land tax is to increase revenue (i.e. to cover infrastructural costs) one should try to impose taxes on property markets with low price elasticity of demand and supply (Needham, 2000).

Furthermore, it is important to note that LBF involves the creation of a value creation opportunity (e.g. public investment); the realisation of this opportunity (private development); the determination of what proportion of the overall value increase is attributable to the state intervention, changing market conditions and private investment; and the capturing and subsequent use of a portion of the additional value by the state (McGaffin *et al.*, 2014). Critically, it must also be recognised that the realisation of any value creation opportunity arising from public investment is the result of the risks, time, efforts and investment of the developer of a property, and therefore, sufficient amounts of the additional value created must accrue to the developer for this realisation to occur (Hui *et al.*, 2004).

5. Land-based financing categories

Based on this theoretical underpinning, a number of LBF mechanisms have been developed over the years to raise public revenue. Broadly, all LBF mechanisms use an increase in land value to directly or indirectly pay for goods and services that are generally of a community or collective nature, or second, to redistribute wealth in society (Needham, 2000; Santos *et al.*, 2016; Suzuki *et al.*, 2015). However, such goods and services can be "mixed" where they can be non-rival but excludable such as a toll road or rival but non-excludable good such as a congested public road (Black *et al.*, 2008). Where such a good or service is excludable but non-rival, such goods or services can be paid for, or partially paid for through user charges. Where the goods or services are non-excludable (e.g. a road network), more general taxes are needed to assist in covering the cost of their provision. It should be noted that the return to the state for public investment is often not limited to a financial return but a more optimal land use such as higher densities, urban regeneration or a more compact urban form may also occur as a result (McGaffin *et al.*, 2014).

Suzuki *et al.* (2015) categorise LBF mechanisms into taxes or fee-based and development-based instruments. Zhao *et al.* (2012) categorise LBF mechanisms based on who benefits from public investment and the timing of the benefit. In terms of the former, the distinction is made between those cases where the benefits of public investment that accrue to specific users exceeds those that accrue to the general public. In terms of the latter, Zhao *et al.* (2012) argue that the type of mechanism used should match the timing of the benefit that accrues from the infrastructure investment. The direct users of infrastructure benefit directly through its use, and therefore, charges earned from these users should be used to cover operation and management costs. Surrounding land values may increase over the life span of the infrastructure, and therefore, any resulting tax revenue earned can be used for both upfront capital and ongoing operation and management costs. Lastly, developers and landowners tend to benefit from the improved location advantages created by the completion of the infrastructure and hence any revenue generated from these users can be

used to cover upfront capital costs. However, Zhao *et al.* (2012) state that all the above mechanisms can be used to fund both capital and operational costs through the application of debt and annuity financing instruments to the revenue generated.

The categories stated by Suzuki *et al.* (2015) and Zhao *et al.* (2012) are adapted in this paper based on the nature of the trigger of the mechanism and the relationship between who pays and who benefits (cost-benefit link). With respect to the trigger, a distinction is made whether the mechanism is initiated by direct or indirect public investment or by the disposal (sale/leasehold) of public land or the granting of development rights. In terms of who pays and who benefits, a distinction is made whether or not there is a direct cost recovery and a direct relationship between who pays and who benefits. This distinction is often on a continuum, and therefore, the categorisation is based on where on the continuum the instrument lies. Table I outlines this categorisation.

The section below uses the above categorisation to outline which LBF mechanisms have been used in South Africa and the degree to which they address the infrastructure funding gap described in Section 3.

6. Overview of LBF mechanisms in South Africa

6.1 Land and development rights trigger

These mechanisms are triggered by the disposal of public land or provision of additional development rights and can be broadly categorised based on the directness of the cost-benefit relationship.

6.1.1 Direct cost-benefit relationship. 6.1.1.1 Development charges. These are levies imposed on developers to pay for infrastructure requirements resulting from additional and expanded land uses (Santos *et al.*, 2016). Development charges have widely been, but inconsistently, used in South Africa for many years. Initiatives are underway to develop a more consistent and coherent policy to achieve this. This is important as such charges can be an effective way to raise funds for infrastructure investment (Savage, 2009). However, the efficacy in this regard is undermined by the fact that first, a development is required to incur these costs upfront when it is least able to do so. Second, the incremental nature of real estate development is incompatible with large-scale infrastructure provision. Third, and as a result, the state is often required to fund capital intensive, bulk infrastructure costs upfront. Fourth, while the calculation of the charges is becoming more transparent, how the funds are used is often unclear, which reduces the cost-benefit relationship of this instrument.

6.1.2 Indirect cost-benefit relationship. 6.1.2.1 Betterment taxes. Betterment taxes are taxes used to capture some of the value that occurs as a result of the positive externalities emanating from public investment. There has been a hesitancy to use these taxes in South Africa because of the concern that landowners may demand compensation from the state for the loss of value due to negative externalities that may equally result from public investment.

Land and development rights trigger		Public investment trigger	
Direct cost recovery/ direct cost-benefit link	Indirect cost recovery/non-direct cost-benefit link	Direct cost recovery/ direct cost-benefit link	Indirect cost recovery/non-direct cost-benefit link
		Specific investment and targeted benefit	Broad investment and general benefit
Development contributions	Betterment taxes	Special assessment districts	Property tax
	Development rights	Tax-increment financing	
	Land disposal		
	Land readjustment		
	Tax abatement		

Table I.
LBF categories

6.1.2.2 Development rights. These include a number of instruments such as density bonuses, Certificate of Additional Construction Potential Bonds (CEPACs) and air rights that raise funds in exchange for development rights. Density bonuses are a zoning-based incentive aimed at encouraging developers to provide certain public amenities or to meet certain public objectives in exchange for allowing greater floor area and/or building height (Santos *et al.*, 2016). The idea is that the additional revenue that the developer could generate from the sale of additional units would compensate for the inclusion of affordable housing or unprofitable public amenities. These have tended to be applied in an *ad hoc* manner in South Africa. However, they are likely to be used in a more systematic manner in the future as density overlay zones are put in place in terms of recently developed municipal inclusionary housing policies. The subdued state of the property market, legal and administrative complexities and the fact that the captured value is likely to be ear marked for housing and other public facilities means that this mechanism is unlikely to generate significant infrastructure investment.

The granting of air rights above public infrastructure to the private sector has been used in South Africa by road agencies and some municipalities to a limited degree. However, the proposed investment and upgrading of the rail system across the country does offer the potential for the sale or leasing of these rights to raise funds for infrastructure if it is done in a systematic manner and at scale (McGaffin *et al.*, 2014).

CEPACs have been mooted in South Africa but have not been implemented. Whilst this mechanism has been used in South America to raise infrastructure funding, the current excess of development rights available in most South African cities means that the application of this mechanism is not likely to effectively increase the funds available for infrastructure investment.

6.1.2.3 Land disposal and development. Instead of maximising the market value of the land sale or lease, the state may choose to prioritise other policy objectives, such as affordable housing in well located areas. However, such leasing or disposal also represents an income-generating opportunity (McGaffin *et al.*, 2014).

It is relatively common for municipalities to dispose of non-core land assets to augment their budgets, and to a lesser degree, achieve broader developmental outcomes. This disposal has generally been on a freehold basis, but there is an increasing intention to shift this disposal to a leasehold basis, from which an income stream can be derived, and for municipalities to enter into partnerships with developers in this process. The proceeds from the disposal of some of the large land assets held by many municipalities could be used to fund infrastructure, but the extent thereof varies by municipality and is conditional on a number of legal issues being resolved, especially with respect to leasehold disposal (Republic of South Africa, 2016).

6.1.2.4 Land readjustment. This is when landowners pool their land together for reconfiguration and redevelopment (Santos *et al.*, 2016). In cases, a portion of the reconfigured land has been used to accommodate infrastructure and raise funds to partially cover the public infrastructure development costs. Land readjustment has been used in South Africa, but generally this has been limited to the upgrading of informal settlements and residential development and generally has not been used as a mechanism to specifically fund infrastructure investment.

6.1.2.5 Tax abatement. The reduction or exemption from property and other taxes for a specific period of time in a designated area can be used to stimulate investment in locations with lower demand or to promote higher densities (Santos *et al.*, 2016). While these exemptions do not directly fund infrastructure, the more compact and dense urban form that results, may lead to the reduced need for infrastructure and improved operational efficiencies and hence they are an indirect infrastructure funding mechanism.

Tax abatement has been used in South Africa, predominantly through the application of the Urban Development Zones. This is effectively an accelerated depreciated taxation allowance that has had some success in incentivizing investment in areas ear marked for regeneration. Although this investment has increased the property rates base in these areas, it is likely that it would have probably occurred without the incentive (City of Cape Town, 2011).

6.2 Public investment trigger mechanisms

These mechanisms can be broadly divided into those where there is more uniform public investment that results in a more general, wide-spread benefit and those where there is specific public investment with a more targeted beneficiary.

6.2.1 Indirect cost-benefit relationship. These mechanisms allow for some of the additional value resulting from broad, more uniform public investment to be used by the state for the benefit of the larger public.

6.2.1.1 Property tax. Property tax is used to pay for community goods and services that are non-divisible and non-excludable and that are generally provided uniformly across a city by the municipality for the benefit of broader society. Besides overcoming the difficulty of charging for the specific use of community goods and services, it is also conceptually sound from a user-pays principle, although in an indirect manner. This is because land value is a function of what occurs within its boundaries – the type, size, quality, etc. of a development, as well as what occurs external to its boundaries – the location value resulting from the surrounding uses, infrastructure, public amenity, etc. (Appraisal Institute, 2008). As the location value is partially the function of the provision of public goods and services, then a portion of a property's value will reflect the benefit and "use" of such public goods and services. A capital gains tax has a similar conceptual basis but as this revenue is collected at a national level in South Africa, it is less useful to local authorities as a revenue source.

6.2.2 Direct cost-benefit relationship. These mechanisms relate to non-uniform, location-specific public investment where the resulting positive externalities are likely to be more localised or will benefit a more limited set of users (landowners and targeted public). These LBF instruments allow for upfront expenditure in a public good or service that can be recouped over time through a series of smaller payments that may, or may not be made possible by a resultant increase in land value (Santos *et al.*, 2016; Berrisford *et al.*, 2018). Importantly, while broader public benefits may occur in the form of economic growth, a general rise in neighbourhood amenity and property values, etc., the majority of the benefits from such expenditure mostly accrue directly to a specific set of landowners (Santos *et al.*, 2016; Berrisford *et al.*, 2018).

Unlike the previously discussed mechanisms where the state captures and redistributes publicly created property value, these mechanisms are essentially cash-flow management instruments to bridge a funding gap. In these cases, the state apparatus is used to raise funds for targeted infrastructure but which is ultimately paid for by the property owners who benefit the most from it. As it is generally clear who the value accrues to, these instruments are generally seen as less complex, but they have been criticised for unduly benefitting particular landowners and reinforcing neighbourhoods with strong market demand, often further entrenching inequitable spatial patterns (Santos *et al.*, 2016; Berrisford *et al.*, 2018).

6.2.2.1 Special assessment districts (SADs). These are designated districts from which pre-set levies are raised to pay for specific capital and operational costs within certain districts (Santos *et al.*, 2016). In South Africa, these areas have been set up as City Improvement Districts. In the case where upfront capital costs are funded, a specified, additional levy is raised from the landowners in the district to raise the required debt

funding (e.g. Claremont Improvement District). Where additional funds are required to cover operating costs an additional charge is levied on property owners to finance "top-up" services to supplement the standard services provided by the state (e.g. Cape Town Central Improvement District). These services are often focussed on security, minor maintenance and cleaning.

CIDs are well understood in South Africa, and the necessary legal and institutional frameworks to support them are in place. In many cases, these districts have been very successful in dealing with the operational (security, cleaning, etc.) issues associated with urban management. However, with the odd exception, this mechanism has not been used to raise funds for capital infrastructure investment, notwithstanding that this opportunity exists.

While having an important role to play in the development and management of South African cities, it is clear from the above analysis that many of the recognised LBF mechanisms have limitations, in an emerging country context, in raising significant funding for infrastructure investment. However, tax-increment finance (TIF), though not currently implemented in the country, could potentially raise significant funding for infrastructure in South Africa. As a result, the issues associated with its implemented are discussed below.

7. Tax-increment financing (TIF)

TIF districts are similar to SADs but instead tend to focus on raising funds to fund capital investment. Furthermore, debt funding is usually raised using the incremental increase in property tax revenue, as opposed to a pre-set levy, that results from rising property values on the back of some infrastructure investment. In short, TIFs enable municipalities to borrow against the future anticipated incremental tax revenue that would be generated within a specific geographic area as a result of the construction of large-scale infrastructure (Santos *et al.*, 2016).

The key question to be asked is why municipalities and developers should use such an instrument when it may be simpler for a municipality to rather issue a standard "general obligation[2]" bond to fund the required infrastructure?

The arguments in favour of using a TIF rather than a "general obligation" bond is that first, it can be used to fund infrastructure needs that arise on the back of a development opportunity created by certain market conditions in specific parts of a city. This infrastructure investment may not have been budgeted for or may not be part of a short to medium-term public expenditure priority. Furthermore, it is a more equitable funding option as using a "user pay" principle is more fiscally efficient as the benefiting area pays for the infrastructure.

Second, it may be difficult to justify using a municipality's borrowing capacity (gearing level) to fund infrastructure that is not addressing basic need backlogs and other development priorities. The use of a TIF overcomes this hurdle because, provided it is deemed to be off-balance sheet, it will not reduce the ability of a municipality to go to the market to raise "general obligation" funds to finance its more immediate development priorities.

Third, TIFs also potentially transfer some of the market risk to the private sector, which is much better equipped to measure and price it. Funding infrastructure through a "general obligation" bond, which is then repaid from the normal property taxes that arise on the development that results, can be a risky exercise for a municipality. This is because the municipality is reliant on the property values, and hence taxes, increasing sufficiently to meet its debt obligations. However, market conditions may prevent this from happening, resulting in the taxpayers having to partially foot the bill for a specific property development. By raising a ring-fenced TIF bond, the market risk is passed

to, or at least shared with, the private-sector bondholders who stand to benefit from a successful property development.

Notwithstanding the abovementioned potential benefits of using TIFs, there are a number of challenges and issues pertaining to their use, namely the need for market demand, an amended legal framework and the necessary agency.

7.1 Market demand

Critically, there needs to be market demand in the specified location to create the increase in property value (Cervero and Murakami, 2009). This means that TIFs are likely to be more successful in buoyant markets and in particular locations in a city (Medda, 2012). TIFs have been criticised in this regard as they are often seen to be reinforcing existing investment patterns in a city (Santos *et al.*, 2016). However, as this represents an additional funding source, it could be counter argued that this financing mechanism actually enables more of existing budgets to be spent in more deprived parts of a city and ultimately increases the tax base of a city.

As the additional finance is raised through the capital markets, it is imperative that relevant financial markets exist and that there is appetite for such investment products in these markets. Capital markets are well-established in South Africa and there is a strong demand for municipal "general obligation" bonds (Goebel, 2017). Whether there will be demand for non-general obligation bonds, however, remains to be tested.

7.2 Legal framework

A legal framework needs to be in place that permits and facilitates the use of LBF mechanisms such as TIFs (Hui *et al.*, 2004). While South African legislation does not disallow the use of TIFs *per se*, it was not written to accommodate them, and such funding would be viewed as being on the balance sheet of a municipality, which would negate one of the main reasons for using it (Hickey-Tshangana, 2011). In particular, key elements of the mechanism would need to be clarified in terms of a legal framework. For example, whether the income is collected as a tax or a user charge, as this will have implications for which enabling legislation applies.

Furthermore, the issue of ring-fencing income would need to be clarified due to the need to link a user charge or tax to the benefit received. However, ring fencing of income is often viewed as problematic to the authorities as it may diminish a municipality's ability to set budget policies and priorities. It is, therefore, important that this funding only be used to unlock development that would not have occurred if the funding was not available (Medda, 2012). Furthermore, the ring-fenced funds are often exempt from the reporting standards that are typically required from the annual budget process, and therefore, have a lesser degree of transparency and accountability. For these reasons, the National Treasury generally prohibits municipalities from ring-fencing income (Hickey-Tshangana, 2011). More specifically, the following amendments to the accounting standards and legislation will need to occur (Republic of South Africa, 2016):

- The funding will need to be viewed as off the balance sheet of a municipality by the Auditor General.
- The need to get consent from the ratepayers in terms of current common law will need to be addressed, as such funding would be seen as prejudicing the ratepayer as they would be seen to have multiple creditors.
- The legislation will need to allow for the creation of a TIF district.
- The legislation will need to allow for sale (vs pledge) of public assets to a special purpose vehicle.

- The allocation of revenue of excess infrastructure capacity will need to be addressed. This is because the provision of bulk infrastructure often occurs in standard units and sizes that come at a considerable cost, which also may exceed the requirements of the development. The question is; who funds this additional capacity, or more importantly, how can the excess capacity be sold to third parties to assist in the payment of the infrastructure?

In addition, consent will need to be attained by a municipality from the National Treasury for there to be a liability/budget time mismatch.

7.3 Agency

Central to addressing some of the above is the need to increase the willingness of politicians, professionals, developers and officials to adopt TIF (and other LBF mechanisms). Research undertaken by Goliath (2015, p. 85) shows that "familiarity, prior use, accepted practice and certainty of application" are key to the propensity to adopt and innovate with respect to these mechanisms. These, in turn, are influenced by first, role-players having the requisite real estate, financial and legal skills and administrative capacity in place. Second, there being regulatory certainty (de-risking experimentation). Third, the level of incentives associated with their use (e.g. inclusion of the use of such mechanisms in the key performance indicators of municipal finance officers). Fourth, the low turn-over of personnel involved, and lastly, there being a common objective or plan.

8. Conclusion

Clearly LBF mechanisms, particularly those that are income generating, have a role to play in addressing the infrastructure challenges outlined in this paper. To begin with, they can assist municipalities in raising local revenue. In addition, they can enable municipalities and the private sector to respond to development opportunities that are dependent on non-budgeted infrastructure investment. Similarly, they reduce the need for municipalities to make trade-offs between infrastructure investment needed for economic development and the redressing of historical imbalances and spatial transformation. Furthermore, under certain circumstances, they can increase the borrowing capacity of municipalities without impacting on their gearing limits and credit rating. Lastly, the risk associated with raising funds off the property market can be shared with the private sector that is often better equipped to assess and mitigate such risk.

Notwithstanding this, the review of LBF mechanisms in South Africa has shown that they are not the panacea for addressing the infrastructure funding gap in the country. However, the review has also shown that they have an important role to play and, hence, it is important that the preconditions needed for each and what type of funding they are best able to generate is recognised. Furthermore, the paper has identified that TIF can also assist in the funding of infrastructure but that the key preconditions of having sufficient market demand, an amended legal framework and the necessary agency are required before this mechanism can be successfully implemented. Critically though, both the current and potential LBF mechanisms discussed are reliant on additional property values being created in the first place, which is reliant on the creation of a property development environment characterised by strong public and private sector participation and coordination.

Notes

1. A good is non-rival if its use does not diminish the use of another person, e.g. street lighting, and non-excludable where private property rights cannot be assigned to a good, allowing for "free-riding".

2. In this case the bondholder would have a general claim on the municipal revenue sources. In the case of a TIF, the bondholder would only have a claim on the revenues of the specific project, unless other guarantees were offered.

References

Agénor, P.R. (2010), "A theory of infrastructure-led development", *Journal of Economic Dynamics and Control*, Vol. 34 No. 5, pp. 932-950.

Appraisal Institute (2008), *The Appraisal of Real Estate*, The Appraisal Institute, Chicago, IL.

Berrisford, S., Cirolia, L. and Palmer, I. (2018), "Land-based financing in Sub-Saharan cities", *Environment & Urbanisation*, Vol. 30 No. 1, pp. 35-52.

Black, P., Calitz, E. and Steencamp, T. (2008), *Public Economics*, Oxford University Press, Oxford.

Brown-Luthango, M. (2011), "Capturing land value increment to finance infrastructure investment – possibilities for South Africa", *Urban Forum*, Vol. 22 No. 1, pp. 37-52.

Buhr, W. (2003), "What is infrastructure?", Siegen Discussion Paper No. 107-03, Department of economics, University of Siegen, Seigen.

Cervero, R. and Murakami, J. (2009), "Rail and property development in Hong Kong: experiences and extensions", *Urban Studies*, Vol. 46 No. 10, pp. 2019-2043.

Cervero, R. and Susantono, B. (1999), "Rent capitalisation and transportation infrastructure development in Jakarta, Indonesia", *Review of Urban and Regional Development Studies*, Vol. 11 No. 1, pp. 11-23.

Chitiga, M., Mabugu, R. and Maisonnave, H. (2016), "Analysing job creation effects of scaling up infrastructure spending in South Africa", *Development Southern Africa*, Vol. 33 No. 2, pp. 186-202.

City of Cape Town (2011), "Extension motivation report for the Cape town urban development zone", unpublished.

Coetzee, C.E. and Kleynhans, E.P.J. (2017), "The contribution of public capital towards economic growth: a KwaZulu-Natal case study", *South African Journal of Economic and Management Sciences*, Vol. 20 No. 1, pp. 1-10.

Debrezion, G., Pels, E. and Rietveld, P. (2007), "The impact of railway stations on residential and commercial property value: a meta-analysis", *Journal of Real Estate Finance and Economics*, Vol. 35 No. 2, pp. 161-180.

Development Bank of Southern Africa (1998), "Infrastructure: a foundation for development", DBSA development report, Pretoria.

Du, H. and Mulley, C. (2007), "The short-term land value impacts of urban rail transit: qualitative evidence from Sutherland, UK", *Land Use Policy*, Vol. 24 No. 1, pp. 223-233.

Fedderke, J. and Garlick, R. (2008), "Infrastructure development and economic growth in South Africa: a review of the accumulated evidence", Policy Paper No. 12, School of Economics, University of Cape Town and Economic Research Southern Africa, Cape Town.

Fedderke, J.W., Perkins, P. and Luiz, J.M. (2006), "Infrastructural investment in long-run economic growth: South Africa 1875–2001", *World Development*, Vol. 34 No. 6, pp. 1037-1059.

Finkenzeller, K., Dechant, T. and Schafers, W. (2010), "Infrastructure: a new dimension of real estate? An asset allocation analysis", *Journal of Property Investment & Finance*, Vol. 28 No. 4, pp. 263-274.

Foster, V. (2008), "Overhauling the engine of growth: infrastructure in Africa", African Infrastructure Country Diagnostic, Washington, DC.

Fourie, J. (2006), "Economic infrastructure: a review of definitions, theory and empirics", *South African Journal of Economics*, Vol. 74 No. 3, pp. 530-556.

Frischmann, B.M. (2004), "An economic theory of infrastructure and commons management", *Minnesota Law Review*, Vol. 89, pp. 917-1022.

George, H. (1879), *Progress and Poverty: An Enquiry into the Cause of Industrial Depressions, and of Increase of Want with Increase of Wealth*, K. Paul, Trench & Company, London.

Glahe, F. and Lee, D. (1989), *Microeconomics—Theory and Application*, 2nd ed., Harcourt Brace Jovanovich, Orlando.

Goebel, J. (2017), "Municipal bonds for infrastructure development in South Africa", discussion document, prepared for SALGA and GIZ, available at: www.salga.org.za

Goliath, G. (2015), "The application of value capture tools in South African municipalities: the bridge city precinct development", dissertation submitted in fulfilment of the requirements for the Master of Philosophy (Urban Infrastructure and Design Management), Department of Civil Engineering, University of Cape Town, Cape Town.

Grimsey, D. and Lewis, M. (2007), *Public Private Partnerships: The Worldwide Revolution in Infrastructure Provision and Project Finance*, Edward Elgar Publishing, Cheltenham.

Harvey, J. and Jowsey, E. (2004), *Urban Land Economics*, 6th ed., Palgrave MacMillan, New York, NY.

Hickey-Tshangana, A. (2011), "Legislative and policy context for the application of value capture mechanisms by municipalities", report undertaken for Urban LandMark, Pretoria.

Hirschman, A.O. (1958), *The Strategy of Economic Development*, Yale University Press, New Haven, CT.

Hui, E., Ho, V. and Ho, D. (2004), "Land value capture mechanisms in Hong Kong and Singapore – a comparative analysis", *Journal of Property Investment & Finance*, Vol. 22 No. 1, pp. 76-100.

Huxley, J. (2009), *Value Capture Finance – Making Urban Development Pay its Way*, Urban Land Institute, Washington, DC.

Ingram, G. and Hong, Y. (2011), *Value Capture and Land Policies*, Lincoln Land Institute, Cambridge, MA.

International Monetary Fund (2017), "Trends and challenges in infrastructure investment in low-income countries", IMF Working Paper No. 17/233, Washington, DC.

McGaffin, R., Napier, M. and Gavera, L. (2014), "Value capture in South Africa – conditions for their successful use in the current legal context", *Urban Forum*, Vol. 25 No. 3, pp. 375-387.

Medda, F. (2012), "Land value capture for transport accessibility: a review", *Journal of Transport Geography*, Vol. 2 No. C, pp. 154-161.

Needham, B. (2000), "Land taxation, development charges, and the effects on land-use", *Journal of Property Research*, Vol. 17 No. 3, pp. 241-257.

Peterson, G. (2008), "Unlocking land values to finance urban infrastructure", Gridlines, Note No. 40, Public-Private Infrastructure Advisory Facility, World Bank, Washington, DC.

Republic of South Africa (2012), "National development plan 2030: our future – make it work", available at: www.gov.za/sites/default/files/Executive%20Summary-NDP%202030%20-%20Our%20future%20-%20make%20it%20work.pdf (accessed 4 May 2018).

Republic of South Africa (2016), "Assessment of the impact of South Africa's regulatory framework: private sector commercial development of municipal land", report prepared for the World Bank and National Treasury Cities Support Programme, Pretoria.

Republic of South Africa (2017), "Medium term budget policy statement", South African National Treasury, Pretoria, available at: www.treasury.gov.za/documents/MTBPS/2017/mtbps/FullMTBPS.pdf (accessed 23 March 2018).

Republic of South Africa (2019), "Budget review 2019", South African National Treasury, available at: www.treasury.gov.za/documents/national%20budget/2018/review/Annexure%20D.pdf (accessed 28 July 2019).

Ricardo, D. (1817), *On the Principles of Political Economy and Taxation*, John Murray, London.

RICS (2002), "Land value and public transport", Royal Institute of Chartered Surveyors and the Office of the Deputy Prime Minister commissioned Atis Real Weatheralls and the University College London, available at: www.rics.org/downloads/static/land_value.pdf (accessed 19 October 2017).

Rodriguez, D. and Mojica, C. (2008), *Land Value Impacts of Bus Rapid Transit – the Case of Bogota's Transmilenio, Land Lines*, Lincoln Land Institute, Cambridge, MA.

Santos, V., Alorro, R. and Goliath, G. (2016), "Land based financing tools to support urban development in South Africa", World Bank report, commissioned by the South African National Treasury, Pretoria.

Savage, D. (2009), "Evaluating the performance of development charges in financing municipal infrastructure investment", discussion paper, second draft – 23 March 2009, prepared for the World Bank, Washington, DC.

Smith, A. (1776), *An Inquiry into the Nature and Wealth of Nations*, Penguin Books, Hammondsworth.

Smolka, M. and Amborski, D. (2000), *Value Capture for Urban Development – A Inter-American Comparison*, Lincoln Land Institute, Cambridge, MA.

South African Cities Network (2011), "State of South African cities: report", South African Cities Network, Johannesburg, available at: www.sacities.net/wpcontent/uploads/2018/01/SACN%202011%20Report.pdf (accessed 5 February 2016).

South African Cities Network (2015), "State of city finances: basics + innovation: report", South African Cities Network, Johannesburg, available at: www.sacities.net/wp-content/uploads/2015/11/SACN_SOCF_FINAL.pdf (accessed 15 February 2016).

South African Cities Network (2016), "State of South African cities: report", South African Cities Network, Johannesburg, available at: www.socr.co.za/wp-content/uploads/2016/06/SoCR16-Main-Report-online.pdf (accessed 8 September 2018).

Steinmueller, W.E. (1996), "Technological infrastructure in information technology industries", in Tuebal, M., Foray, D., Justman, M. and Zuscovitch, E. (Eds), *Technological Infrastructure Policy: An International Perspective*, Springer, Netherlands, pp. 117-139.

Suzuki, H., Murakami, J., Hong, Y. and Tamayose, B. (2015), "Financing transit-orientate development with land values – adapting land-value capture in developing countries", World Bank Group, Washington, DC, available at: https://openknowledge.worldbank.org/handle/10986/2174 (accessed 19 June 2018).

The African Development Bank Group (2018), "African economic outlook – 2018", African Development bank Group, Abidjan, available at: www.afdb.org/en/documents/document/african-economic-outlook-aoe-2018-99877

Visser, C. and Erasmus, P. (2002), *The Management of Public Finance: A Practical Guide*, Oxford University Press Southern Africa, Oxford.

World Bank (2017), "Africa's Pulse: An analysis of issues shaping Africa's economic future", World Bank Group report, Washington, DC.

Zhao, Z., Iacono, M., Lari, A. and Levinson, D. (2012), "Value capture for transportation", *Procedia – Social and Behavioral Sciences*, Vol. 48, pp. 435-448.

Further reading

Bogetic, Ž. and Fedderke, J.W. (2005), "Infrastructure and growth in South Africa: benchmarking, productivity and investment needs", *The Biennial Conference of the Economic Society of South Africa, Durban, 3-5 September*.

Ramparsad, S. (2015), *Leveraging Land-Based Financing (through Private Sector Investment) to Finance Urban Infrastructure in Sub-Saharan Africa*, Centre for Affordable Housing Finance in Africa, Johannesburg.

Stupak, J. (2018), "Economic impact of infrastructure investment", Congressional Research Service No. R44896, available at: www.crs.gov (accessed 15 July 2019).

Corresponding author
Luke Boyle can be contacted at: Luke.Boyle@uct.ac.za