

Assessment of Funding Options for Infrastructure Delivery at a Local Government Level: A KwaZulu-Natal Case Study

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In spite of recent increases in public infrastructure investments in South Africa (SA), municipal infrastructure is decaying faster than it is being renewed (DBSA, 2012 and Boshoff, 2009). Peters (2013) states that years of neglect in caring for infrastructure networks have placed many local municipalities on the precipice of a breakdown. Factors such as low funding, poor planning, population growth, urbanization, tighter health, safety and environmental standards, poor quality control leading to inferior installation, inadequate inspection and maintenance, and lack of consistency and uniformity in design, construction and operation practices have impacted on municipal infrastructure.

Bailey (2011) states that public infrastructure delivery can be funded from one or both of public finance or private finance. Traditionally, the majority of public finance has come from government borrowing. Revenues from taxes are then used to repay the ensuing debt over the expected lifetime of these physical assets provided by the public sector itself. This traditional infrastructure funding model secures inter-generational equity by smoothing out the one off costs of infrastructure investments so that future users of infrastructure pay for it rather than placing the whole financial burden on the current generation of taxpayers.

Infrastructure shortfalls can have serious implications for communities and businesses in terms of the protection and continued utility of capital assets (Federation of Canadian Municipalities, 2002, Business Council Australia, 2013). The potential implications are broader than economic issues, however, when consideration is given to the role infrastructure plays in providing essential services, supporting economic development, protecting health and safety, and contributing to quality of life in the community.

The current trends in local government infrastructure funding in South Africa clearly indicate that historic and traditional mechanisms of funding infrastructure delivery are inadequate to meet most needs (see for instance Josie, 2008 and Franks, 2012). It is especially social infrastructure in growth corridors that are lacking. Alternative funding mechanisms can provide part of the answer to infrastructure needs. But it must be made very clear that alternative funding mechanisms are not a panacea.

There are several potential benefits associated with alternative funding mechanisms:

- revenue to support continued provision of safe and efficient infrastructure;

- supplementing the property tax base;

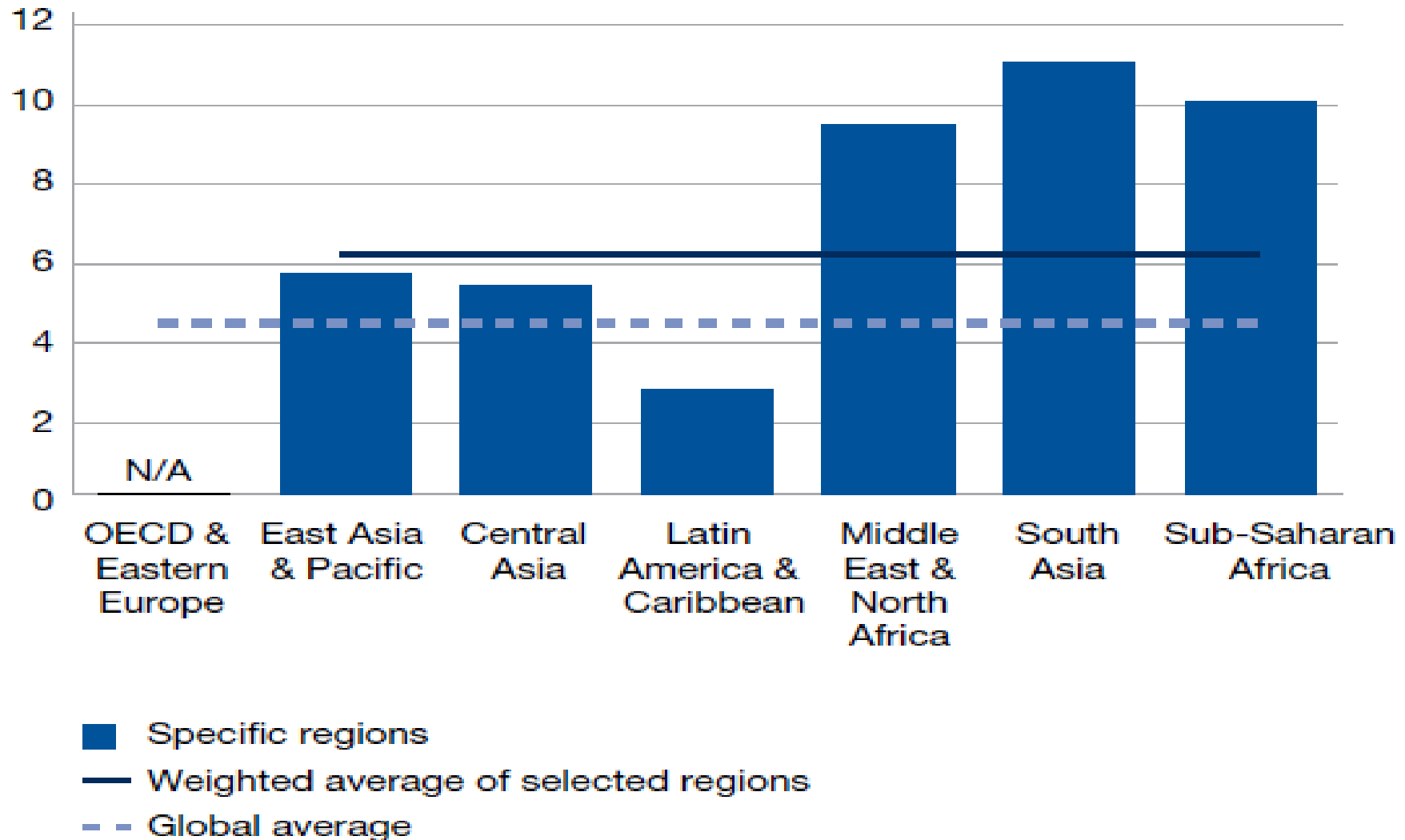
- incorporating life cycle costs of infrastructure (i.e., depreciation of infrastructure; operation and maintenance costs resulting from new capital investments);

- reliable, predictable, dedicated funding to support multi-year infrastructure investment strategies;

- providing additional options to generate infrastructure funds; and

- demand management techniques being developed.

The WEF report (2012) includes the below graphic that illustrates the proportion of gross domestic product (GDP) that economies need to invest in economic infrastructure (both to build new infrastructure and maintain existing assets) to enable prolonged economic growth.



What is public infrastructure?

Industry Super Australia (2013) states that 'public infrastructure' consists of physical assets and related services. Physical public infrastructure assets include both economic infrastructure (such as roads, rail, ports, and communication) and social infrastructure (such as correctional, health, educational, accommodation, public housing and court facilities). Public infrastructure, whether economic or social infrastructure, exhibit shared characteristics: they both deliver essential services, have long economic lives, high capital costs, high barriers to entry, high levels of uncertainty and illiquidity and often involve governments as regulatory or funding counterparties.

Definition of funding and financing mechanisms

Calitz and Fourie (2007) contextualized the distinction between funding and financing of public infrastructure. The term funding refers to how infrastructure is paid for. Ultimately there are only two sources of funding for infrastructure – government revenue raising (the tax payer) or direct user charges. This is opposed to financing, which refers to the way debt and/or equity is raised for the delivery and operation of an infrastructure project.

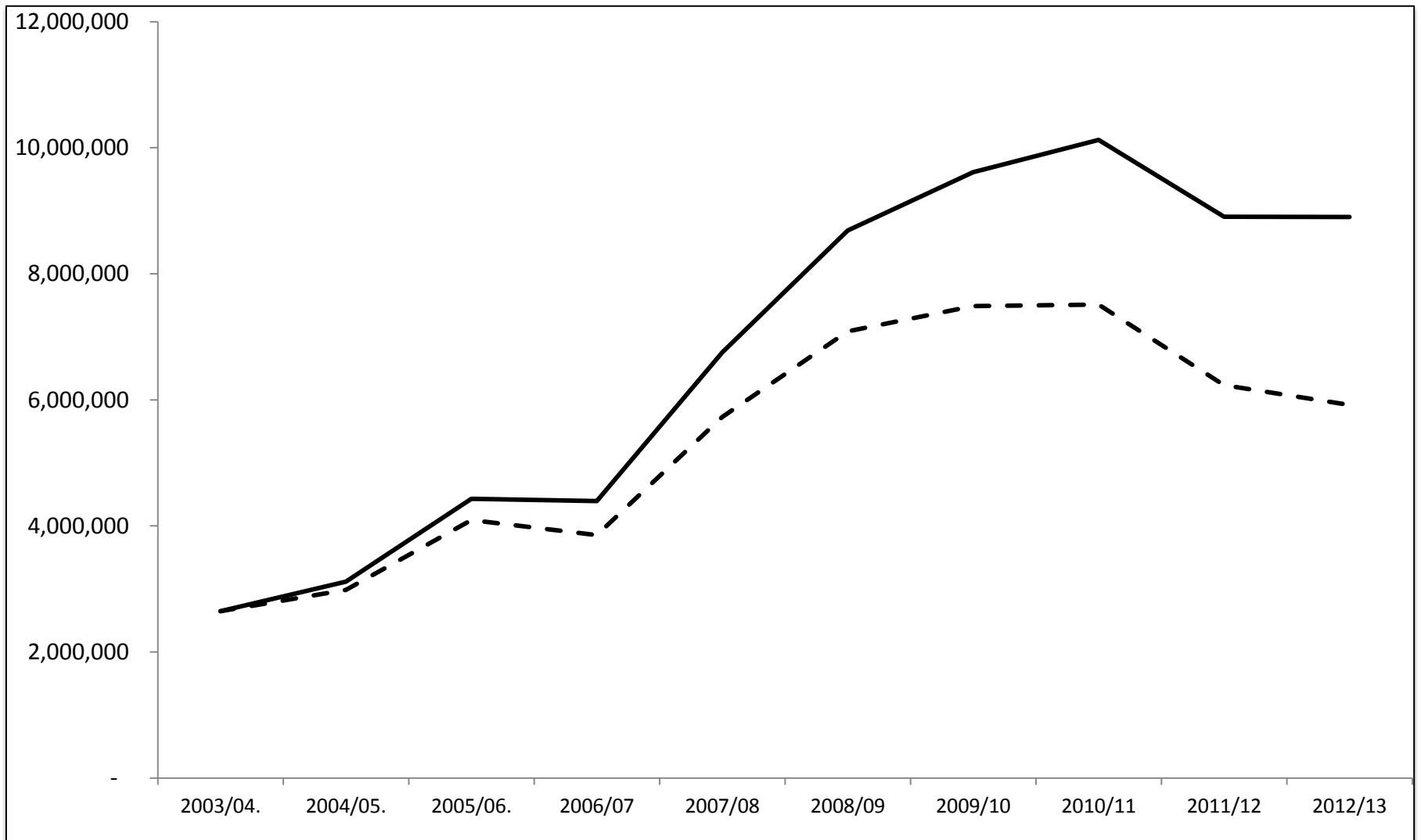
Definition of funding and financing mechanisms

Funding, according to the Committee for Melbourne, for infrastructure is ultimately sourced from the community.

Funding can be sourced directly from users of infrastructure or indirectly through taxes and charges (or rates for local government).

A funding source must be present to
support finance

Trends in local government infrastructure delivery – Nominal and Real, R'000



Trends in local government infrastructure delivery – Nominal and Real, R'000

Total infrastructure expenditure is estimated at R11.9bn, R11.3bn and R12.9bn over the 2013/14 to 2015/16 financial years. In real terms it seems that local government infrastructure expenditure has and will stayed constant at best.

Trends in local government infrastructure delivery

Source of Finance	External Loans	Public Contributions and Donations	Grants and subsidies	Other
2003/04.	16.11	0.02	40.55	43.31
2004/05.	18.11	0.87	34.12	46.90
2005/06.	34.71	1.16	44.65	19.48
2006/07	24.97	0.11	56.49	18.43
2007/08	17.77	0.56	49.72	31.95
2008/09	13.32	0.64	54.19	31.86
2009/10	13.19	0.05	48.96	37.80
2010/11	6.15	0.35	57.78	35.72
2011/12	4.90	0.57	53.36	41.17

Trends in local government infrastructure delivery

Capital Expenditure	Water and Sanitation	Electricity	Housing	Roads and storm water	Other
2003/04.	26.77	10.09	1.30	3.25	58.59
2004/05.	21.42	10.16	1.24	3.01	64.18
2005/06.	31.85	9.15	0.83	10.50	47.67
2006/07	32.24	11.12	3.13	14.08	39.43
2007/08	27.76	8.77	12.75	13.38	37.35
2008/09	31.93	8.34	3.80	14.83	41.10
2009/10	34.13	8.21	1.90	21.19	34.58
2010/11	32.77	11.77	14.64	16.62	24.20
2011/12	36.35	13.15	16.51	14.64	19.35

PUBLIC INFRASTRUCTURE AND THE FUNDING GAP IN SA

The Development Bank of Southern Africa in 2013 published a report titled “Municipal Planning and Infrastructure Implementation Support - *A Sustainable Governance Framework*” in which they present the following statistics, i.e.,

Municipal infrastructure funding needs will increased by R251bn over 5 years (2013 to 2018) and is estimated as follows ;

Metropolitan municipalities = R95bn, secondary municipalities = R50bn and under resourced municipalities = R105bn

PUBLIC INFRASTRUCTURE AND THE FUNDING GAP IN SA

**The infrastructure funding gap will increase by R105bn
over the 5 years and is estimated as follows:**

Metropolitan municipalities R36bn, secondary
municipalities = R10bn and under resourced municipalities
= R58bn

Capital transfers to municipalities, despite growing, are not
sufficient to bridge the infrastructure funding gap.

PUBLIC INFRASTRUCTURE AND THE FUNDING GAP IN SA

Municipal revenues are growing slowly and are under severe pressure, i.e.,

Metropolitan municipalities is down to 21% of capital budgets from 30 % in 2006.

Secondary municipalities is down to 20% of total capital budgets from 38 % in 2006.

Under resourced municipalities is down to 17% of total capital budgets from 32% in 2006

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PUBLIC INFRASTRUCTURE AND THE FUNDING GAP IN SA

With the above in mind National Treasury (2013) states that the White Paper (1998 White Paper on Local Government) recognised the need for multiple sources of investment and envisaged municipal infrastructure being funded through a combination of:

- (a) capital grants from national government;
- (b) local cross-subsidisation; and
- (c) the mobilisation of private investment.

INTERNATIONAL EXPERIENCE AND LITERATURE WRT PLUGGING THE FUNDING GAP FOR LOCAL GOVERNMENT INFRASTRUCTURE

Baily (2011) submitted a report titled “Innovative Models for Funding Public Sector Infrastructure: UK Case Study” that discusses a number of possible funding models. The report states that there has clearly been a long-term trend in the UK away from the public provision of infrastructure financed from general taxation to private sector provision (through charges and fees) of both infrastructure and related services.

INTERNATIONAL EXPERIENCE AND LITERATURE WRT PLUGGING THE FUNDING GAP FOR LOCAL GOVERNMENT INFRASTRUCTURE

Property taxes. Property taxes. Supplementary Business Rate. Local Betterment Tax (Planning Gain). Local Betterment Tax (Planning Obligations). Infrastructure charges (Local Tariffs). Infrastructure charges (Statutory Planning Charge). Infrastructure charges (Community Infrastructure Levy). Infrastructure charges (Social Cost Tariff). Infrastructure charges (Impact Fees). Land Value Tax. Special Levies. Development Fees. Utility Models. Sponsorships. Strategic Budget Allocations. Funding Partnerships. Fiscal Support. Public Sector Utility Reserves.

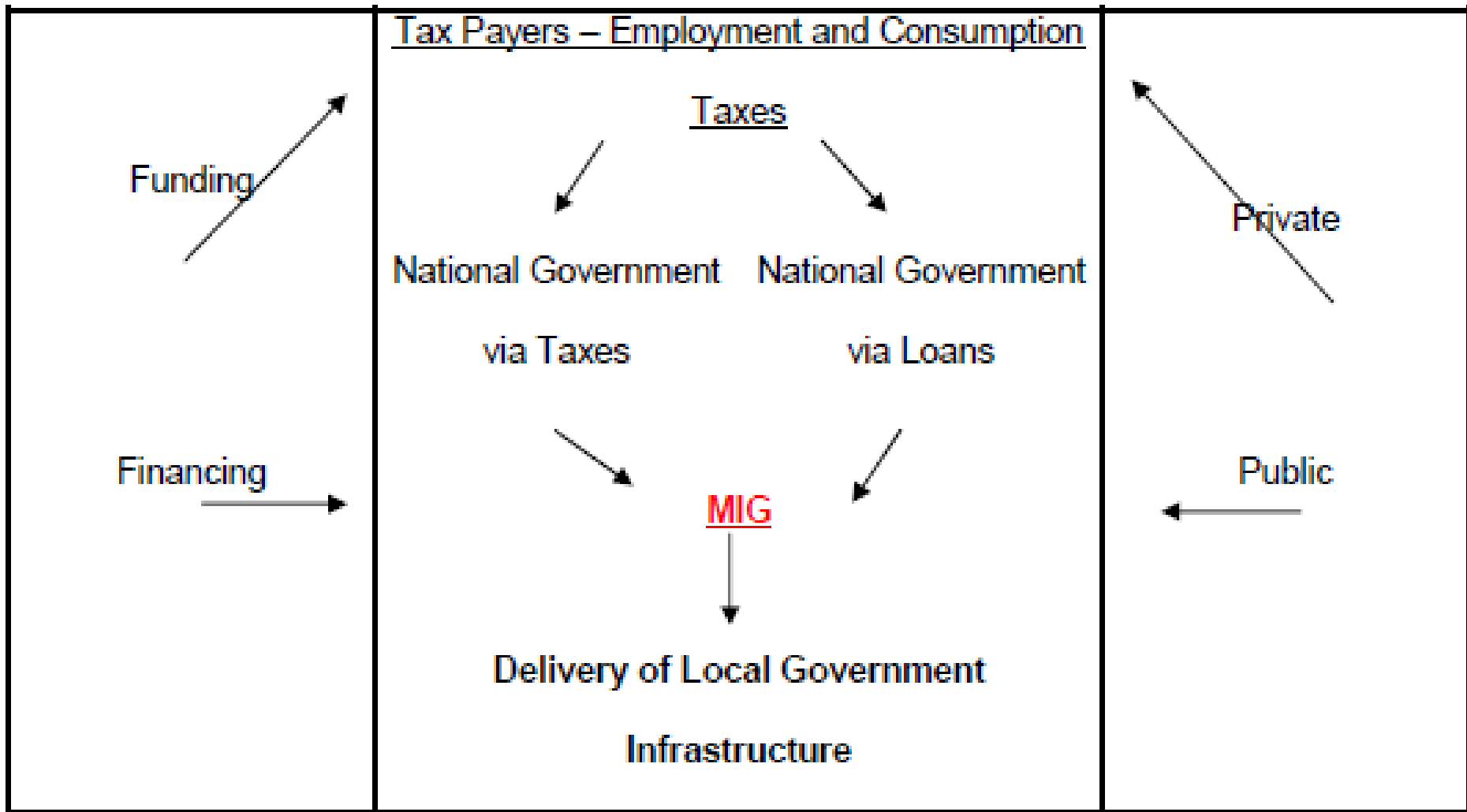
INTERNATIONAL EXPERIENCE AND LITERATURE WRT PLUGGING THE FUNDING GAP FOR LOCAL GOVERNMENT INFRASTRUCTURE

Commercial Finance through Loans and Bonds. Equity Investment. Donor Support and Green Funds. Expand the use of the PPP. Develop capital markets. Remove barriers. Develop infrastructure markets. User charges. Value capture. Developer contributions. Decentralisation processes and endogenous financing. Local Financial Markets. Land-based financing mechanisms. Development Bank for Infrastructure

THE FUNDING-FINANCING NEXUS

The majority of local government infrastructure in SA and KZN is financed by national government grants most notable the Municipal Infrastructure Grant (MIG). The MIG is specifically designed to finance infrastructure delivery at a local government level. MIG is a capital grant from national government. MIG provides grant finance to cover capital costs of basic infrastructure for the poor. The funds are determined by formula, and are paid into the bank account of the municipality according to a MIG schedule agreed to with the municipality.

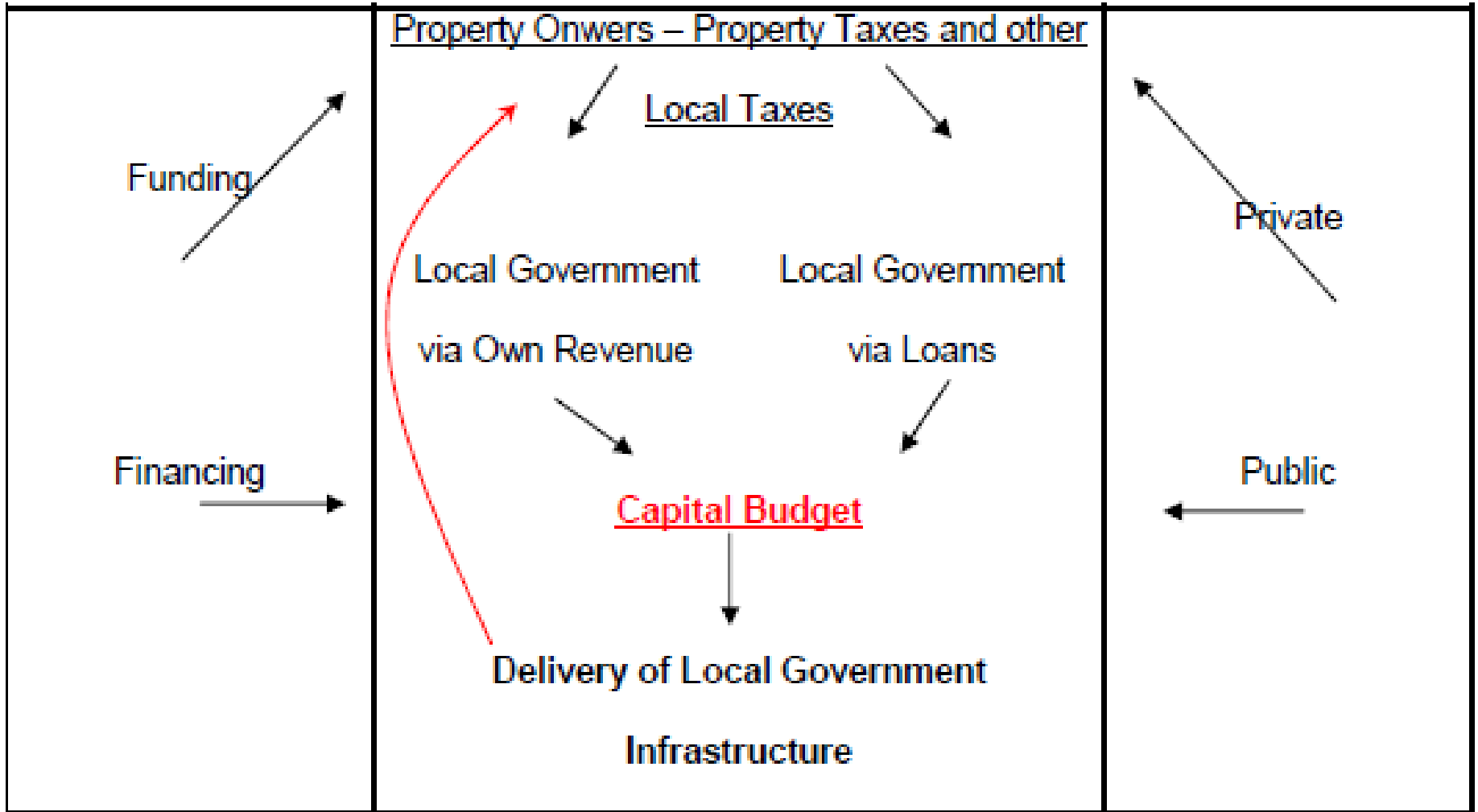
THE FUNDING-FINANCING NEXUS



THE FUNDING-FINANCING NEXUS

A **second** funding and financing model is the use of “local tax revenue” for infrastructure delivery. Local Government has a number of tax powers, i.e., they derive revenue from implementing local government taxes, most notable property taxes. Property taxes are a stable form of revenue since it allows only limited tax exportation. It acts as a rough form of benefit charge as well. Property rates are calculated on the value of the land and of any improvements or buildings.

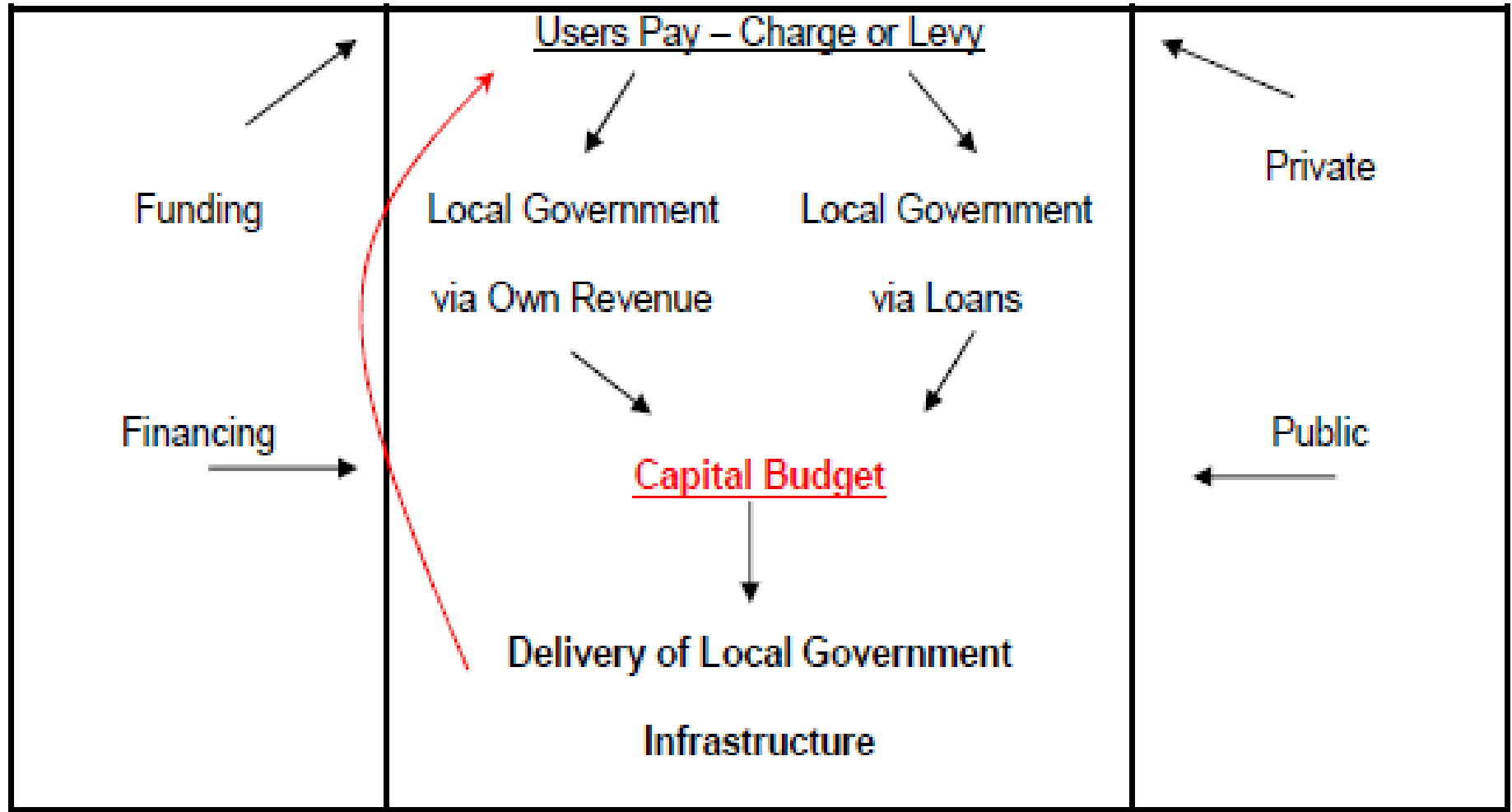
THE FUNDING-FINANCING NEXUS



THE FUNDING-FINANCING NEXUS

A third funding and financing model is the use of “user chargers or fees”. Local Governments provides services to their customers, i.e., residents and in return the customers must pay for the services they receive, for example water and electricity. User charges differ from taxes in two important ways. First, user charges are a charge to people and businesses for benefits they receive specifically; taxes are general charges for services that benefit everyone in roughly equal shares. Second, user charges are to some extent voluntary and avoidable, while taxes are compulsory.

THE FUNDING-FINANCING NEXUS



THE FUNDING-FINANCING NEXUS

The above three models focuses on the various sources of municipal income, i.e., funding is generated/collected by the municipality either from national government (MIG) or from its residents and businesses (taxes and charges). There are various sources of income (Education and Training Trust, <http://www.etu.org.za/>) that can be used by municipalities to finance their expenditure for example:

THE FUNDING-FINANCING NEXUS

External loans.
Internal loans.
Contributions from revenue.
Government grants.
Property Rates.
Service Charges / Tariffs.
Fines.
Equitable share.

THE FUNDING-FINANCING NEXUS

National Government will have to increase the size of the MIG or the equitable share, i.e., allocate more funding to the MIG and/or equitable share. This can be done by either increasing the revenue sources of the national government (increase taxes etc) or through the re-allocating of funds (move funds from one or more commitments to the MIG and/or equitable share).

THE FUNDING-FINANCING NEXUS

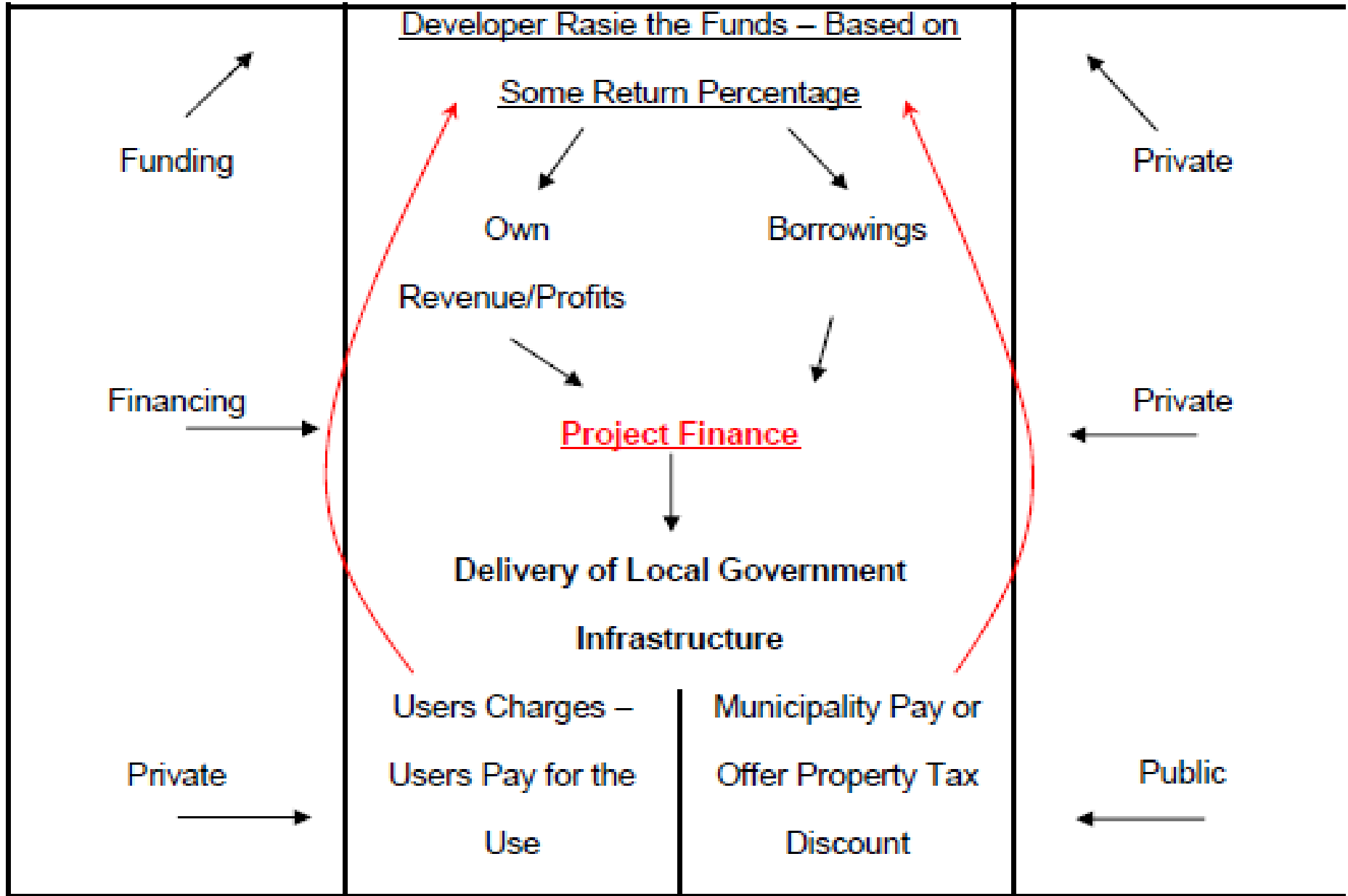
Local Government can increase their current property and other taxes, expanding the tax base to new payers and/or implement new taxes.

Local Government can increase their charges and fees, expanding the base to new payers and/or implement new charges and fees.

THE FUNDING-FINANCING NEXUS

A **fourth** options looks at the possibility of private funded and financed, i.e., the private sector fund and finance the local government infrastructure delivery. In the private funded and financed model the private sector allocate funds through either retained profits or borrowings towards the infrastructure delivery. The developer therefore funds and finance the project based on some estimated future rate of return percentage. The return on the infrastructure delivery is derived from user charges or some payment or discount agreement with the municipality.

THE FUNDING-FINANCING NEXUS



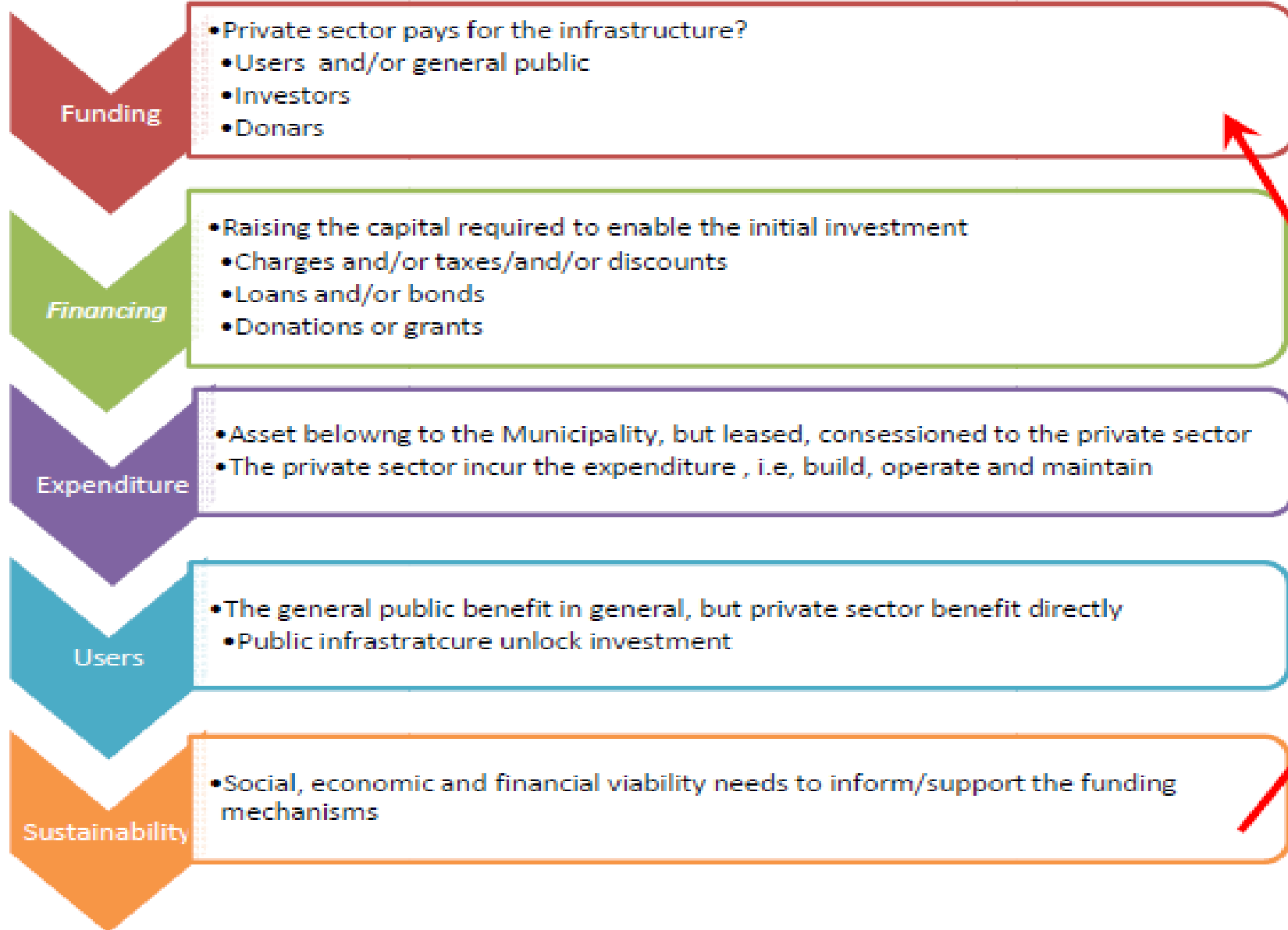
THE FUNDING-FINANCING NEXUS

The difference between the public and private model is essentially the financing mechanisms of the infrastructure delivery and not the funding. The funding mechanism is private (consumers and businesses) irrespective whether the model uses the public or private financing mechanism. Given the constraint ability by local government to increase and expand taxes and charges it seems fairly obvious that the use of first three models will continue to be of limited value to expand on the delivery of public infrastructure.

THE FUNDING-FINANCING NEXUS

The following diagram displays the possible non-traditional or alternative local government infrastructure delivery process flow (with reference to the above 4th model). The process starts with the funders, i.e., who pays and then focus on the financing mechanism (private finance mechanism). It then focus on the ownership of the infrastructure and who will be responsible for the actual delivery of the infrastructure, i.e., private vs. public delivery. It also focuses on the users of the infrastructure and the sustainability of the infrastructure.

THE FUNDING-FINANCING NEXUS



THE FUNDING-FINANCING NEXUS

The literature makes reference to the below non-traditional or alternative mechanisms. It must be stated that some of them have been or are being used in some way or form, but only by a very limited number of municipalities. They are not the norm, but rather the exception and it's not because they cannot work, but rather because of a limited understanding and appetite to employ them. Some of them are also politically not very desirable.

THE FUNDING-FINANCING NEXUS

1) Sponsorships/Donations and Grants – This is an ideal source of funding for infrastructure delivery since there is no costs involved, i.e., it does not increase the total costs of the investment/project.

Unfortunately scarcity of funds persists. The sponsorship/donation or grant can be directly made to either the private or the public.

THE FUNDING-FINANCING NEXUS

2) Commercial Finance through Loans and Bonds/ capital markets – This source of funding has huge potential and is in general very seldom used.

However the source is only available for the few big municipalities, can potentially be expensive and is politically sensitive. Also some municipalities are over-borrowed so they have little room to increase their borrowings. On the other hand there is no reason why the private sector cannot make the loan or issue the bond within an agreement with the public.

THE FUNDING-FINANCING NEXUS

3) Equity Investment/infrastructure markets – This really refers to the Public Private Partnership mechanism, which theoretically are attractive, but practically there seems to be very little appetite from both the private sector and public sector side to enter into PPP's. However the potential is there if the cost and risk associated with the PPP process can be lowered.

THE FUNDING-FINANCING NEXUS

4) Economic/Financial incentives/Developer Discounts – This source of funding relates to the use of the municipal rates and taxes policy for infrastructure delivery. It uses the tax and charges instruments of the municipality as incentives. This is the mechanism that will be discussed in more detailed below sine it's the author's view that it holds the most potential.

Economic/Financial incentives/Developer Discounts

Many local governments offer incentives for current and/or potential investors. The offering of investment incentives and business attraction and retention measures seems to be a worldwide practice in both developed and developing countries, provinces and cities. Governments including local governments offer such incentives to attract and grow investment, to steer investment into favoured industries and/or regions, or to influence the character of an investment. Governments also use such incentives as business retention measures to either (a) keep a business from leaving or (b) try to keep a facility from shutting down

Economic/Financial incentives/Developer Discounts

The very same scenario as above can be applied to the delivery of public infrastructure, i.e., the municipality has some infrastructure delivery objective. It does not have the means (funding) to achieve the objective and therefore has to convince/persuade an external party to support it. The municipality has to offer the external party financial and/or non-financial incentives to enter into a mutual beneficial agreement. Without the financial and/or non-financial incentives there is no reason for the external party to enter into the agreement.

Economic/Financial incentives/Developer Discounts

Critical to the success of these incentives for both parties are the following:

Must be a combination of financial and/or non-financial incentives

The financial and/or non-financial incentives should be relevant to the new public infrastructure only and only if it's part of a larger residential, commercial or industrial development

The financial and/or non-financial incentives will then be applicable to the full development, i.e., the incentives on the development compensates for the costs of the delivery of the public infrastructure

Economic/Financial incentives/Developer Discounts

Financial incentives can include exemptions or discounts on inter alia property taxes, building plans and capital contributions and concessions on water, electricity and refuse removal services, but only for the new. This will ensure that there are no direct budget implications for the municipality.

The municipality does not directly fund the development. The developer funds the development including the public infrastructure. However the municipality forgo the full rates and taxes benefits of the development for a certain numbers of years to compensate the developer for the public infrastructure.

Economic/Financial incentives/Developer Discounts

The must incentives focus on the cash flow of the development and not the capital expenditure of the development.

The financial and/or non-financial incentives must not require a complex administration.

CASE STUDY ANALYSIS

The value of the property (V) is comprised of two factors- the structure (**V_k**) and the land (V_L).

$$V_k = \sum_{t=1}^n \frac{(R - C)}{(1 + i)^t}$$

R = Revenue

C = Costs

t = time period

n = expected life span of the structure, which is assumed to be quite large ($n \rightarrow \infty$)

CASE STUDY ANALYSIS

The value of the land (V_L) is assumed to be exogenous to the value of the structure, but dependent on the location and is a function of time, i.e., $V_L = \mathcal{V}(t)$. Revenue related to the development can be expressed as a combination of two separate factors: (1) sales (rents and/or production) derived from the structure; and (2) equity accrued from the appreciation of the property. The revenue generating capability of a property is a direct function of capital investment (x), subject to a diminishing rate of return.

CASE STUDY ANALYSIS

The cost to the developer can be expressed as a combination of five separate factors: (1) interest payments which are a direct function of the capital investment (investment include the public infrastructure which is required by the development); (2) the tax on the structure; (3) the tax on the land; (4) municipal service charges; and (5) the cost of maintenance and rehabilitation.

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CASE STUDY ANALYSIS

The cost function can be written as:

$$C = ix + \lambda V_k + \lambda^\alpha V_L + s(t) + m(t)$$

where

i = interest rate

x = capital investment

λ = tax rate

$m(t)$ = cost of maintenance which is a function of time ($M = m(t)$)

$\alpha \neq 1$ if land and structure have different tax rates

s = municipal service charges (electricity, water, etc) which is a function of time ($S = s(t)$)

CASE STUDY ANALYSIS

Profit (π) on investment is expressed as the difference between revenue and costs:

$$\pi = R - C$$

Rearranging and substituting the various above formulas into the profit function we obtain:

$$\pi = Rf(x) - [ix + \theta R + \lambda^\alpha \{ (t) + s(t) + m(t) \}]$$

where

$$\theta = \frac{\lambda}{i}$$

SUMMARY AND CONCLUSIONS

