

# Financial and Fiscal Commission

Submission for the  
Division of Revenue 2005/06



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Proposals from the FFC Review of the  
Intergovernmental Fiscal Relations System

June 2004



For an Equitable Sharing of National Revenue

**Financial and Fiscal Commission**

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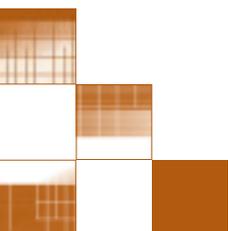
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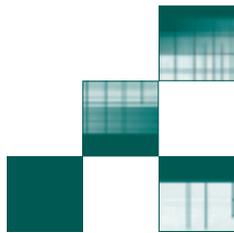
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# Abbreviations

AOBB	Accrual Output-Based Budgeting Systems
ASSA	Actuarial Society of South Africa
CMIP	Consolidated Municipal Infrastructure Programme
CMBS	Constitutionally Mandated Basic Services
CPI	Consumer Price Index
DBSA	Development Bank of Southern Africa
DPLG	Department of Provincial and Local Government
ECD	Early Childhood Development
FBE	Free Basic Electricity
FBS	Free Basic Services
FFC	Financial and Fiscal Commission
GAMAP	Generally Accepted Municipal Accounting Practice
GDPR	Gross Domestic Product by Region
GGP	Gross Geographic Product
GHS	General Household Survey
IDP	Integrated Development Plan
IES	Income and Expenditure Surveys
INCA	Infrastructure Finance Corporation
ISRDP	Integrated Sustainable Rural Development Programme
LFS	Labour Force Survey
LES	Local Government Equitable Share
LSM	Learner Support Materials
MFMA	Municipal Finance Management Act
MIG	Municipal Infrastructure Grant
MTEF	Medium Term Expenditure Framework
NER	National Electricity Regulator
NGO	Non-Governmental Organisation
OBE	Outcomes-Based Education
OHS	October Household Survey
PCGM	(FFC's) Provincial Capital Grant Model
PED	Provincial Education Department
PES	Provincial Equitable Share
PHSL	Primary Household Subsistence Levels
PPBS	Planning Performance Budgeting Systems
RDP	Reconstruction and Development Programme
RED	Regional Electricity Distributor
RSC	Regional Services Council
SARS	South African Revenue Services

SARB	South African Reserve Bank
SDL	Skills Development Levy
StatsSA	Statistics South Africa
UIF	Unemployment Insurance Fund
URP	Urban Renewal Programme
VAT	Value Added Tax
WSA	Water Service Authority
WSP	Water Service Provider



# Foreword

On the 27 April 2004, South Africa completed ten years as a democratic and constitutional state. During 2004, various events will mark this political triumph for the people of South Africa. Both in its symbolic and concrete terms, this milestone signifies a complete and decisive break with South Africa's past apartheid policies.

In addition to setting the basis for the birth of democracy, our Constitution was also accompanied by the establishment of political and judicial systems and processes as well as constitutional institutions and structures of governance critical for the entrenchment and protection of our newly born democratic order. Indeed, our Constitutional dispensation is firmly underpinned by a Bill of Rights, a recognition of the primacy of the rule of law, and above all the principle of equality of all citizens before the law. It is within this context and in pursuit of these ideals that the Financial and Fiscal Commission was established and for which it celebrates ten years of its existence as a constitutional institution mandated to play a significant role in the development of South Africa's intergovernmental fiscal relations system.

Various sections of the Constitution (Sections 214, 218, 220, 228-230) provide for the FFC's role, mandate, and obligations with respect to the intergovernmental fiscal relations system. Two core parameters for the functioning of the Commission stand out, namely to act as an independent and impartial body and to make recommendations on the equitable vertical and horizontal division of revenue raised nationally among the three spheres of government. Legislation subsequent to the above provisions, namely the Intergovernmental Fiscal Relations Act, mandates the Commission to submit to Parliament and Government, on an annual basis, recommendations on the Division of Revenue. In so doing, the Commission is tasked with the responsibility of making such recommendations by taking into account factors listed in Section 214(2)(a-j) of the Constitution.

Over the last ten years, the work of the Commission not only related to the fiscal system per se, but was also an integral part of government-wide efforts to deal with the intricacies and modalities of a society and state undergoing a profound socio-economic, political, and cultural transition. Accordingly, the Commission carefully tracked the exigencies of fiscal reforms undertaken within the ambit of wider development and socio-economic pressures. In keeping with such dynamics common to any transition, the trajectory of the development of the Commission's advice and recommendations over the last ten years was based on a core consideration, the goal of equity in the allocation of revenues to the three spheres of government such that they fulfil their obligations under the Constitution.

As has been the case with many government institutions, the completion of ten years of democracy opened a window for reflection and the assessment of the fiscal system in order to enable the Commission to chart the possibilities for further progress over the coming ten years.

The recommendations contained in this submission highlight the outcome of the Commission's review of the revenue sharing system and fiscal framework in South Africa. There are contained herein proposals for

changes to the system, and more particularly to the Provincial and Local Government Equitable Share formulae. Several key themes are given prominence across the various proposals, such as:

- Factors contributing to the need of subnational governments to speed up the delivery of services;
- The need to address infrastructure backlogs, particularly in the social welfare, education and health sectors;
- The need to enhance access to constitutionally mandated basic services (CMBS);
- The importance of targeting resources to the vulnerable sectors of our population in order to speed up the eradication of poverty; and
- The need to monitor and measure the outcomes of Government's performance in order to assess its impact on poverty reduction.

These strategic elements will constitute an IGFR roadmap that will be further explored when the Commission hosts its conference on intergovernmental fiscal relations in August 2004. Planned as a celebration of the tenth anniversary of the existence of the Commission, the conference themes will be informed by issues raised in this submission. It is the Commission's hope that the outcome of the Conference will highlight key policy options for consideration by Government.

This submission is the product of considerable collaboration and research. The Commissioners would like to thank the members of all departments, intergovernmental forums and relevant Ministries who contributed to this document with their information, insights, and criticisms. This submission would not have been possible were it not for their support.

In shaping the contents of this Submission, the FFC drew on the knowledge and insights of technical advisors. Their international experience greatly enriched the approach of the Commission to the complex fiscal issues addressed in this Submission. These advisors included Andrew Reschovsky (United States), Ronald Neumann (Canada), Govinda Rao (India), Alex van der Heever (South Africa), Jeff Petchey (Australia), Gary Macdonald (Australia), Ravi Kanbur (United States), Tyrone Carlin (Australia), Michael O' Donovan (South Africa) and Robin Boadway (Canada).

The Commission would also like to express its gratitude to the Secretariat of the FFC, namely Myron Peter (Executive Manager: Commission Co-ordination), Hildegard Fast (Manager: Parliamentary Liaison and Local Government), Bongani Khumalo (Manager: Fiscal Policy Analysis), Conrad van Gass (Manager: Budget Analysis), Veronica Mafoko (Researcher: Fiscal Policy - Social Sector), Goodwill Dithlaga (Researcher: Fiscal Policy - Social Sector), Robert Mabunda (Researcher: Data and Information), Rathipe Nthite (Research Co-ordinator: Infrastructure), Phillemon Mathane (Fiscal Policy : Social Sector), Jeffrey Mashele (Researcher: Budget Analysis), Denver Kallis (Research Assistant: Local Government), Hammed Amusa (Researcher: Fiscal Policy) and Vincent Makinta (Statistical and Database Management). In addition, the logistical support from Annaleeze Prosee and Lyn Desai ensured that plans and processes to produce the document were kept on track.

While this submission was developed at a time when the size of the Commission was being reduced from twenty-two (22) Commissioners to nine (9) through a constitutional amendment, it is made with the approval and under the authority of all the Commissioners listed hereunder and in office during the preceding 18 months of its formulation.

**Current Commissioners:**

Commissioner Renosi Mokate  
Commissioner Antony Melck  
Commissioner Kamalassen Chetty

**Outgoing Commissioners:**

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Commissioner Philip Hourquebie  
Commissioner Lieb Loots  
Commissioner Marcus Mdhuli  
Commissioner John Douw  
Commissioner Gugu Molo  
Commissioner Duncan Albertyn

As the Executive Commissioners of the Financial and Fiscal Commission, we the undersigned are pleased to submit this Submission in accordance with the obligations placed upon us by the Constitution of the Republic of South Africa.

**For and on behalf of the Commission:**

Chairperson	Murphy Morobe	
Deputy Chairperson	Jaya Josie	
Date	June 2004	

# Executive Summary and Recommendations:

## Submission for the Division of Revenue 2005/06

Section 220 of the Constitution establishes the Financial and Fiscal Commission as an independent and impartial body. The Constitution mandates the FFC to make recommendations on the vertical division of nationally raised revenue among the three spheres of government, the horizontal division of revenue between provinces and between municipalities, legislation pertaining to the issuing of loan guarantees by the three spheres of government, provincial tax legislation, municipal fiscal powers and functions, and provincial and municipal borrowing powers (Sections 214, 218, and 228-230).

Following Sections 214 and 222, Section 9 of the Intergovernmental Fiscal Relations Act of 1997 provides for the FFC to make annual recommendations to Parliament and the provincial Legislatures on the vertical and horizontal divisions of revenue, and Section 10 requires that Government consult the Commission on the annual Division of Revenue Bill and outline its response to the Commission's recommendations. In performing its functions, the Commission considers the factors listed in Section 214 (2)(a-j) of the Constitution and the Bill of Rights in Chapter 2 of the Constitution.

## 1. Proposals for the Review of the Provincial Equitable Sharing System

This section of the Submission presents proposals from a comprehensive review of the provincial equitable sharing mechanism. The proposals are based on studies that have been conducted by the Commission in the last twelve to eighteen months. In developing the proposals, the Commission has taken cognizance of the responses to its proposals over the last four years, and in particular followed up on Government's responses to the FFC recommendations as presented annually in Annexure E of the Division of Revenue Bill.

The first area that is addressed is the need to augment provincial revenue sources. From the viewpoint of fiscal autonomy, efficiency and accountability, linking revenue to expenditure decisions is important. This will enable the provinces to play a proactive role in the provision of public services. Revenue-raising powers at provincial level are also important for properly designing the overall transfer system. The proposal is in line with the spirit of the Constitution and past FFC recommendations on provincial revenue sources.

The second area is the review of the current provincial equitable share formula. Detailed examination of the individual components of the formula shows that it considers only some beneficiary groups. There are a number of other “needs” factors, such as specific beneficiary groups of the population, input cost variations, and cost disabilities arising from poverty and different scale economies, which are beyond the control of provinces. These factors should be addressed in the formula in order to enable every province to provide a given normative and standard bundle of public services. Such factors also apply to the local government equitable share formula (see section 8), and cost disabilities could well be incorporated into the FFC’s Provincial Capital Grants Model (section 5.2).

In addition, this part of the Submission notes that the weights assigned to the different PES components need to be revised to take account of the changing priorities and changing composition of components in the PES formula. The prevailing weights were largely determined in 1999, and subsequently the actual expenditures in the provinces have changed to reflect new Government priorities. Furthermore, inclusion of early childhood development (ECD) in the education component and the exclusion of social security payments alter the composition of expenditures of the provinces.

The review then focuses on the seven components of the formula and evaluates how each of them has performed against the objectives of achieving efficiency and equity in the delivery of services by provinces. The review consists of an evaluation of principles and an econometric analysis of allocations and expenditures of the seven formula components since the implementation of the formula up to 2003/04 fiscal year.

The Commission notes that Early Childhood Development will be incorporated into the education component of the PES from 2004/05, and proposes that the education component should be augmented at least by the full amount of the current conditional grant. It would be useful to consider the entire school education component together for determining the funding requirements of basic education. This would ensure that the overall funding of education is not compromised by the pressures resulting from extension of allocations to incorporate ECD.

In the case of health care services, the formula should be revised to take account of the gender and age profile of the population. This is because the burden on public health facilities depends on the actual demand placed on them by the population. A survey should be undertaken to ascertain the intensity of use of public health facilities by different age and gender groups to determine the expenditure needs in different provinces.

With respect to the social development component, the Submission proposes that social security grants should be removed from the PES formula and converted into a conditional grant while the National Social Security Agency is being established. The role of provinces in social security transfers should be to identify the potential beneficiaries and effect payments. The inclusion of cash transfers as a PES component tends to crowd out expenditures on other sectors.

The Submission argues that it is inappropriate to consider the economic activity component as a compensation for the taxes collected in different provinces, as the provinces currently do not exercise their tax powers. It would be more appropriate to consider the economic activity component as providing for the maintenance of the existing physical assets such as roads and buildings and other public infrastructure.

The Commission proposes that the backlogs component should be removed from the PES formula. It then becomes important to ensure minimum standards of basic infrastructure in all the provinces. This would require a conditional grant programme, preferably with some matching contributions. The variable that should determine the conditional grant is the estimate of the backlog. It is necessary to make a detailed estimate of various infrastructure requirements of provinces, the prevailing levels, and the shortfalls. In this respect, this Submission presents the revised provincial capital grants model (PCGM) that was first proposed by the FFC in 2000, and provides an overview and illustrative examples of how the model works.

In evaluating the formula components, other issues identified in the past recommendations are also discussed, namely learner support materials (education component) and welfare services (social development component).

The final section in this part provides a review of the conditional grant mechanism.

## 1.1 Proposals and recommendations: Review of the Provincial Equitable Sharing System

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**With respect to the transfer system and the PES formula:**

- Government should introduce incentives for provinces to raise revenues from sources assigned to them by the Constitution and legislation.
- The weights assigned to the different components in the PES formula need to be revised to take account of the changing priorities and composition of provincial expenditure in the PES formula.
- The PES formula should be revised to account for relevant cost disabilities of provinces.
- The Commission re-iterates its previous proposal of April 2003 that the formula used to allocate the education component of the equitable share be revised to end the double weighting of “school age” children. In this respect, the department of education should ensure that reliable school enrolment data is collected regularly.
- The Commission notes that ECD will be incorporated into the education component of the PES from 2004/05. The FFC proposes that in view of the need for the provision of ECD, the education component should be augmented at least by the full amount of the current conditional grant, given the need for phasing in the programme.
- In the case of health care services, the formula should be revised to take account of the gender and age profile of the population in order to reflect differential needs for health care services.

Furthermore, the department of health should ensure that data on health care utilisation rates for different population groups is regularly collected.

- The social development component should be removed from the PES formula, and during the transition period towards the full establishment of the National Security Agency, all grant allocations for social security may be funded via a conditional grant mechanism or any other appropriate funding mechanism determined on a case-by-case assessment of each province's capacity and experience in the administration and payment of such grants. In addition the national Social Development Department must ensure that adequate measures are in place to monitor the proper administration and payment of social security grants.
  - In order to ensure minimum disruption to service delivery, government should ensure that the status quo with regards to the financing and delivery of welfare services in provinces remains until such time that the transition to the National Social Security Agency is complete.
- In the absence of significant own revenue from provinces, the economic activity component of the PES formula should be defined to provide for the maintenance expenditure requirements of social and public infrastructure and should be redesigned accordingly.

#### With respect to capital expenditure:

- Government should incorporate the backlogs component of the PES formula into the basic component and a separate conditional grant should be set up for financing capital infrastructure. This should be allocated to provinces using the FFC's proposed provincial capital grants model.

## 2. Proposals for the Review of the Local Government Equitable Sharing System

The FFC is in the process of reviewing the local government equitable share (LES) formula, and is participating in Government's LES review process. It is clear that the data to support the long-term LES formula will only be available in the next five to eight years. For example, data from municipal valuation rolls will be available in 2008 at the earliest.

There has been a measure of stability introduced into the local equitable sharing system since 2002/03 owing to the publication of three-year allocations, and it would be unwise to introduce an entirely new formula in the interim period. It then becomes important to assess and (if necessary) revise the current formula to ensure that it results in allocations that satisfy the principle of equity and that conform to sound intergovernmental principles. With respect to the current formula, a number of funding windows have been introduced into the local

government equitable share formula since 2002/03, namely windows for funding development nodes, free basic electricity (FBE), and free basic services (FBS). There are a number of concerns with respect to the use of funding windows in the equitable share. First, there is no indication from Government that these funding windows are temporary. Second, there is no information provided on how the global allocation to each funding window was determined. Finally, there is a duplication between the S component and the FBE / FBS windows, both of which are meant to fund basic service delivery to the poor. If Government wishes to establish a link between operational expenditure and existing infrastructure, as is being done through the FBE / FBS windows, this should be effected through explicit policy instruments rather than through funding windows.

Another issue addressed in this Submission is the pledging of local government equitable share allocations as security to obtain loan finance. The concern about this practice is that debt default by a municipality could compromise the delivery of constitutionally mandated basic services. Access to loan finance is vital to the functioning of a municipality, however the ceding of revenue streams deemed essential for maintaining services should be approached with caution. The conclusion is reached that the legislative framework supports the practice of pledging equitable share allocations, but that it does not provide adequate safeguards to protect the delivery of basic services.

With regard to the future LES formula, this Submission re-iterates its previous proposal that the long-term equitable share formula should be based upon constitutional requirements. This suggests that the formula should include components relating to basic service delivery (S), other constitutionally assigned functions (B), core institutional capacity (I), tax capacity equalisation (T), and spillovers.

The Submission then addresses issues arising from the S, I, and T components. In assessing the Services component of the formula, it is important to understand the extent to which expenditure needs may vary from one municipality to another. There may be factors influencing service costs that are beyond the control of municipalities, and these factors should be reflected in the local government equitable share formula. This section outlines the methodological approach of the FFC and presents the key principles that should inform the assessment of expenditure needs of municipalities.

With respect to the I (Institutional) component, the Submission notes the shortcomings of the current I component. The fiscal capacity measure of average income applies to the I component only, rather than to the LES formula as a whole, the formula makes untested assumptions about economies of scale in the provision of institutional infrastructure, and the formula does not include disability factors, such as population density and distance from major urban centres. This section proposes research into these issues and outlines an approach to defining “core institutional capacity”.

This section also presents the results of the research conducted by the FFC into revenue-raising capacity, or the T component. Its starting point is that the tax base of municipalities should be measured directly. Each major revenue source available to local government is examined, namely regional levies, property rates, electricity surpluses, and other tariff income, and the data needed to assess the fiscal capacity of each revenue source is outlined.

Finally, the relationship between infrastructure grants and the equitable share formula is explored. Municipalities with substantial infrastructure backlogs receive their full equitable share allocation despite the fact that their operating expenditure needs may be lower than municipalities that provide services to a greater proportion of residents. This section explores the issues that this raises and discusses options for addressing the situation.

## 2.1 Proposals: Review of Local Government Equitable Sharing System

- Government should avoid the use of funding windows in the equitable share formula.
- The FFC reiterates its previous proposal that the long-term equitable share formula should be based upon constitutional requirements, which suggests the following formula:

$$LES = S + B + I + T + m$$

Where

LES	Local government equitable share allocation
S	Component to support the delivery of basic municipal services
B	Component to fulfil other constitutional and legislative responsibilities
I	Component to finance core administrative functions
T	Component for tax capacity equalisation
m	Spillover grant to provide finance for services with intermunicipal spillover effects

- The assessment of municipal service costs should be informed by the following principle:
  - Residents in a given jurisdiction have the right to a basic level of service provision. There will be different types of service delivery within the basic level owing to the nature of the technology required.
- As Government reviews the LES formula, it is suggested that the following principles should inform the development of the methodology for assessing municipal service costs:
  - In developing a measure of expenditure needs, municipalities should not be able to influence the magnitude of their expenditure needs through their fiscal decisions;
  - The methodology should not be too data-intensive;
  - A strategy that combines statistical analysis of data with expert opinion provides a realistic approach for South Africa;
  - Calculations of the costs of providing basic services should be built up separately for each local government function; and

- It is important that the grant formula should be as simple as possible.
- Consideration should be given to applying a revenue-raising capacity measure to the LES formula as a whole, rather than only to the I component.
- It is currently inappropriate to develop a formula for the disbursement of capacity-building funds directly to municipalities, as most capacity-building initiatives are not supported by direct grants to municipalities. However, it is advisable to develop appropriate administrative and/or institutional instruments that ensure that capacity needs are identified and adequately targeted.
- Government should ensure that the following municipal-level data is collected:
  - Regional levies: skills development levy data disaggregated to district municipal level (if the payroll levy is retained);
  - Property rates: municipal valuation roll data and specific rates data (that is, rates charged for each category of property); and
  - Electricity: consumption data (disaggregated into consumer categories).
- The funds required to subsidise the tariff charges of low-income households should be carefully assessed in order to ensure that poor residents in all municipal jurisdictions have access to a minimum level of basic service provision.
- Consideration should be given to linking the MIG and equitable share formulae. In doing so, the following should be taken into account:
  - The need to provide municipalities with appropriate incentives to extend municipal infrastructure;
  - The need to achieve equity in addressing the expenditure needs of local government;
  - The need to take account of the differing capacities of municipalities; and
  - The need to ensure that LES allocations keep pace with the installation of household infrastructure.
- Government should consider two broad options with respect to the ceding of equitable share revenue as security to obtain loan finance:
  - The Municipal Finance Management Act could be amended to ensure that the safeguards proposed in section 48(3) and (4) apply also to the ceding of equitable share revenue.
  - In light of the overall safeguard provided by the Constitution and national legislation, Government could issue guidelines to municipalities with respect to the ceding of equitable share revenue. This could propose safeguards and recommend that the pledging of equitable share revenue only occur where the loan is intended to finance infrastructure for basic service delivery.

### 3. Proposals for the Intergovernmental Fiscal Relations System

This part of the Submission addresses three areas that underpin the intergovernmental fiscal relations system, namely the collection of quality data, the further development of poverty targeting, and the introduction of performance-based budgeting. A key theme is measuring the demand for and access to constitutionally mandated basic services.

FFC recommendations have increasingly been reliant on a good supply of quality data, which the current system has not been able to supply. For this reason the FFC decided to undertake an assessment of the extent to which data is available to support its research and recommendations.

This data section examines a range of data issues. It discusses the methodologies and advantages and disadvantages of the various surveys, such as the October Household Survey, Labour Force Survey, and Income and Expenditure Survey. It also evaluates the appropriateness and adequacy of data used in the allocation of funds for constitutionally mandated basic services by sector (namely education, health care, and social development).

Current household survey data at the municipal level is not reliable because the sample sizes are too small. Government should examine the practicality of pooling these surveys. By pooling multiple surveys, the statistical confidence intervals can be tightened to the extent that reliable estimates of household income at municipal level may be generated. In addition, as municipalities conform to GAMAP, the warehousing and evaluation of municipal accounts should be regulated and co-ordinated.

Household income poverty is a key indicator in determining the level of demand for constitutionally mandated basic services and other services. Government should establish a definitional norm for household income poverty so that appropriate short-, medium-, and long-term policy targets may be set.

Policy outcome indicators are fundamental in ascertaining the outcome of the progressive realisation of CMBS and other services. Government and its statistical agencies should consider a few simple indicators to measure the impact of the delivery of services through the use of surveys. Such surveys would compare the achieved impact to the required impact. Among others the following indicators may be considered:

- The percent of the population below a given income level not receiving grants as compared to the take-up rates for the grant; and
- The number of households without access to clean running water piped to within an officially determined policy target norm. This may be linked to the incidence of water-borne diseases and nutritional impacts on vulnerable groups in the community.

The results of the FFC's data assessment will inform the establishment of an IGFR data warehousing system within the FFC. IGFR data thus collected, warehoused, and processed will enhance the development of socio-economic indicators crucial for the work of the FFC and IGFR policy formulation in general.

During the course of its budget and strategic reform initiatives, Government could consider measuring performance through progressive improvements in policy outcome indicators (for example, Government's contribution to accelerating long-term economic growth potential in support of employment generation and income, capability, and asset poverty reduction). In order to facilitate this, policy outcome measures should be consistent over time.

Independent and official checks should be required to assess the incidence of government programme benefits and the quality or level of the service. Independent checks are important to counter incentives to exaggerate demand or exercise errors of inclusion and exclusion.

Consideration should be given to more closely defining the employment status of the economically active population. Employment status could be defined on the basis of vulnerability to or risk of poverty and active unemployment.

Measurable improvements in developmental and policy outcomes are not always directly attributable to the growth of outputs or improvement in quality of services delivered. For example, there are factors aside from social security provision that contribute to income poverty reduction. Policy outcome measures can be chosen on their capacity to inform the strategic objectives of functional sectors (such as education) or cross-functional clusters (such as public works) of the public sector.

Consideration could also be given to the time frames of the impacts of service delivery on these policy outcomes. For example, social security grants are likely to have a short-term impact on income poverty reduction. By contrast, investments in education and basic infrastructure are more likely to have long-term and inter-generational impacts.

Priority should be given to estimating, as a performance indicator of the coverage of service delivery, the proportion of target groups that have access to the constitutionally mandated services listed or implied in the Bill of Rights (such as education, housing, and safety and security). This can be developed on the basis of the recent General Household Survey which measures household access to constitutionally mandated basic services.

Government, Constitutional bodies and institutions, and Statistics South Africa should work towards common definitions of populations targeted for the delivery of Constitutionally mandated services on the basis of age / gender, disability, poverty, and vulnerability. This would help to provide common definitions for policy-makers, a common dataset for public sector planning, and an independent check on organisational estimates of demand.

With respect to budget reform, the introduction of performance-based budgeting systems should be evaluated on the basis of their capacity to stimulate a greater quantity or quality of service outputs for the same injection of resources. In addition, it should be assessed whether better accountability information flows are induced, additional costs (or savings) are incurred, and implementation is feasible given projected resource constraints.

Fiscal management reforms should be based on the principle of aligning the performance incentives of subnational governments (and agencies) with national policy objectives. This requires that information sharing and transparency between the spheres of government be improved. In this way, areas of wastage and/or mismatch between resource requirements and actual resource provision can be more easily identified.

Consequently, research should be conducted on identifying the specific information resources of each sphere of government that ought to be shared to enhance efficient delivery. It is also important to identify the incentives of different spheres of government to conceal resources, exaggerate demand, or waste resources at year-end. A research agenda focusing on these elements should yield recommendations on budgetary system design with potential to generate material savings and efficiencies over time.

### 3.1 Proposals: Intergovernmental Fiscal Relations System

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#### With respect to data and information:

- Government should examine the practicality of pooling current household surveys at the municipal level so as to ensure that reliable estimates of household income at municipal level may be generated. This may be further aggregated to the provincial level.
- As municipalities conform to GAMAP, the warehousing and evaluation of municipal accounts information should be regulated and co-ordinated.
- Government and its data-gathering agencies should establish a definitional norm for household income poverty so that appropriate short-, medium-, and long-term policy targets may be set.
- Government, Constitutional bodies and institutions, and Statistics South Africa should work towards common definitions of populations targeted for the delivery of Constitutionally mandated services on the basis of age / gender, disability, poverty and vulnerability.

#### With respect to poverty targeting:

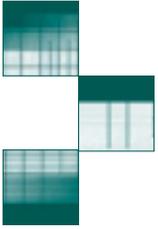
- Government should consider measuring performance of the delivery of CMBS through progressive improvements in policy output and outcome indicators.
- Policy outcome measures could be chosen according to their capacity to achieve the strategic policy objectives of line function and inter-departmental budget programmes. In this regard:
  - Consideration should be given to the effect of time lags on the achievement of policy objectives.
  - Long-term analysis of trends and policy outcome measures should be consistent over time in order to determine effective performance in the delivery of services.

- Levels of poverty may be determined by the extent of the take-up rate of the basic services implied in the Bill of Rights and should be updated annually.
- Independent and official administrative instruments should be instituted to assess the impact of government programme benefits and the quality or level of the service.
- A more consistent and precise official definition of the employment status of the economically active population, taking into account all sources of income, should be put in place in order to facilitate programme planning and budgeting.
- Priority should be given to estimating the proportion of target groups that have access to the constitutionally mandated services listed or implied in the Bill of Rights.

#### **With respect to budgeting systems:**

- Any attempt to introduce new performance-based budgeting systems should be evaluated on the basis of:
  - their capacity to stimulate a greater quantity or quality of service outputs, or an improvement in policy outcomes, for the same injection of resources;
  - whether accountability information flows are improved;
  - whether additional costs (or savings) are incurred from the human resource and technology requirements of such reforms;
  - whether implementation is feasible given projected constraints on the availability of appropriate human and technological resources.
- Fiscal management reforms should be based on the principle of aligning the performance incentives of subnational governments with national policy objectives.
- Research should be conducted on identifying (a) the specific information resources of each sphere of government, which ought to be shared to enhance efficient delivery and effective outcomes, and (b) the incentives of different spheres of government to conceal resources, exaggerate demand, or waste resources at year-end.





# Review of the Provincial Equitable Sharing System

**[Part 1]**



## SECTION 1

# FFC Review of the Provincial Equitable Sharing System

The design and implementation of the system for allocating revenues to the provinces is of critical importance for the delivery of social services in the Republic of South Africa. The Constitution assigns the responsibility of providing basic social services (the most significant being education and health) and administering social security grants and welfare schemes to the provinces. Though provinces raise roughly 1.3 percent of their revenue, they account for about 44 percent of total government expenditure incurred at all levels.

Thus, over 97 percent of the provincial expenditure is financed by transfers from national government and almost 90 percent of this is received by way of the unconditional provincial equitable share. Thus, the Provincial Equitable Share (PES) formula design is extremely important in determining efficiency and equity in the provision of public services in South Africa.

The PES formula has seven components that take into account the main functions of the provinces. They are as follows:

- An education component, which constitutes 41 percent of the formula;
- A health component (19 percent);
- A welfare component (18 percent);
- A basic component (7 percent);
- A backlog component (3 percent);
- An economic activity component (7 percent); and
- An institutional component (5 percent).

Each of these components is considered in detail in this part of the Submission.

Weights are assigned to each component broadly based on the aggregate expenditure incurred in the past, and these are revised periodically to take into account the changes in priorities of government. Although the allocations of provinces are determined in terms of the seven components, provinces have the discretion to spend their equitable share transfers according to their own priorities since the allocation is unconditional and thus fully fungible.

The formulae for individual components of the PES formula are simple and take into account broad indicators of need in respect of each category. However, some challenges that still need to be addressed have been pointed out by the FFC in its past submissions, both in terms of the choice of variables and the weights assigned to them.<sup>1</sup> A significant challenge is that the formula does not include cost disability factors.

In addition to the PES, about 10 percent of provincial expenditure is financed through conditional transfers. Conditional grants are used mainly to ensure the delivery on national priorities and also to deal with inter-provincial spillovers.

Following the FFC recommendations for the Division of Revenue 2003/04, Government decided that a comprehensive review of the provincial equitable share formula was required. There are important reasons for undertaking such a review of the PES formula, and indeed the overall design of the revenue sharing system, namely:

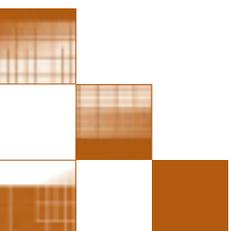
- The current formula has now been fully phased in; and
- The latest census data has been available since 2003. This requires an assessment of the appropriateness of the current weights assigned to the different components of the formula, as it is heavily driven by demographic patterns.

This submission reviews:

- The provincial equitable share system, including the formula from its inception in 1998/99 until 2003/04;

1. See Financial and Fiscal Commission, *Submission for the 2001-04 MTEF Cycle*, May 2000.

- The performance of the PES formula with respect to the stated policy objectives of the Government, taking into account provisions of Section 214(2)(a-j) and other relevant sections of the Constitution;
- The use of provincial conditional grants; and
- The provincial capital grants model of the FFC that was first proposed in the FFC's submission for the 2001-04 MTEF Cycle.



## SECTION 2

# Augmenting Own Revenues of Provinces

The current situation in South Africa is such that provinces raise an insignificant amount of revenue compared to their expenditure needs, although the enactment of the Provincial Tax Regulation Process Act (2001) may change the situation. Thus, while expenditure assignment is highly decentralised to provincial governments, current revenue assignment is highly centralised. This is because national government controls the revenue sources with broad bases, while provinces only have access to narrow-based taxes and a few user fees.

The overwhelming dependence of the provinces on transfers impacts on expenditure in two important ways:

- First, it imposes a constraint on the provinces' ability to change their expenditure patterns. Thus, the volume of expenditure incurred by each province depends on the volume of transfers.
- National government has a significant influence on the equity considerations in spending through the current structure of the PES formula.

Although the contribution of own revenue in provincial expenditures is not significant, the FFC has attempted to understand the differences in per capita revenue collections between the provinces. Econometric analysis done by the FFC on provincial variations in per capita revenues collected in different

provinces over the period 1997/98 to 2001/02 indicates that per capita Gross Domestic Product by Region (GDPR) is not a significant determinant of provincial revenue, an indication that provinces do not put any systematic effort into raising revenue.<sup>2</sup> However, revenue raised by provinces is significantly related to urbanisation and the poverty ratio, indicating the relative importance of the two major provincial revenue sources, namely motor vehicle licences and fees and gambling taxes.

Encouraging provinces to raise more of their revenue needs and introducing matching requirements for some conditional grants could result in provinces being more able to alter spending in line with their circumstances. However, assigning more revenue-raising powers in itself does not necessarily ensure that they raise more revenue. Even though the provinces have the powers to levy taxes such as a surcharge on the personal income tax, none of the provinces currently impose the surcharge. It is therefore important to consider various ways in which the transfer system could incorporate appropriate incentives for provinces to raise more of their own revenues. Such policy incentives should encourage provincial expenditure accountability, responsibility, and efficiency, and should direct expenditure towards sustainable economic growth and development.

## 2.1 Proposal: Augmenting Own Revenues of Provinces

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- Government should introduce greater policy incentives for provinces to raise revenues from sources assigned to them by the Constitution and legislation. Such incentives should encourage provincial expenditure accountability, responsibility, and efficiency, and should direct expenditure towards sustainable economic growth and development.

2. See Annexure A for a summary of the results.

## SECTION 3

# The PES Formula: A Review of its Design

As mentioned earlier, there are seven components in the PES formula. Included in it is a broad indicator of “need” – a demographic variable representing the beneficiary group of the population. The entitlement of each of the provinces is estimated for each of the seven components separately and then aggregated. A province is in principle free to alter the allocations to different functions according to its own priorities.

Conceptually, if equalisation is effected on the revenue side, there is no need for expenditure equalisation, though cost disabilities may be considered to enable equalisation in service standards. However, in South Africa the provinces do not raise significant amounts of revenue and therefore equalising revenues is not a meaningful objective. Instead, the transfer system should be designed to provide minimum normatively determined standards of public services. This implies that the system needs to take into account the differences in the cost of providing a given standard of public services among provinces.

To enable every province to provide a given level of public service in an equitable manner, it is necessary to estimate the allowable costs (that is, all those costs over which provinces do not have control) of providing

the given standard of services. Expenditure variations among provinces can be due to differences in the quantity and quality of public services provided or the cost of providing the public service.<sup>3</sup> Ideally, the PES formula should estimate the effect of various quantity and cost factors impacting on expenditures in respect of each of the seven components. Expenditure “needs” may then be estimated by multiplying the given (normative) quantity of the service to be provided with the admissible unit cost of providing the service.

In actual practice, very few intergovernmental transfer systems take into account expenditure needs. Australia is an important exception, where both revenue and cost disabilities are measured by the Commonwealth Grants Commission to estimate the relativities of the States, and this is the basis of the distribution of unconditional grants. In South Africa, the weights assigned to the seven components in the PES formula are determined historically. Although initially this might have depended on the composition of expenditures when the formula was first introduced, the weights are not sensitive to the changing composition of expenditures.

The formula that is currently used to determine the equitable share of the provinces takes into account one or two variables that broadly represent the quantity factor (need), namely demographics, and, through the social development component, poverty. However, this provides only a partial measure of expenditure need. The formula does not take into account the impact of cost variations among provinces that are due to factors such as population density and economies of scale. These challenges in the design of the PES formula become even more pronounced when the formulae for the individual components are examined.

### 3.1 The Education Component<sup>4</sup>

The determination of the education component of the PES formula is extremely important as it has the highest weight at 41 percent. The education component takes into account enrolment ( $A_i$ ) and the children in the school age group, 6-17 ( $P_{i\ 6-17}$ ), with twice the weight assigned to the latter. The PES formula for the education sector is:

$$A_i + 2 (P_{i\ 6-17}) / [\sum_i A_i + \sum_i 2 (P_{i\ 6-17})]$$

The enrolment factor represents the actual beneficiary population, whereas the population in the age group is supposed to represent the potential beneficiary group. The number of children actually attending the school is important as the actual cost of providing the service depends on this. The reasoning behind using the school age population, irrespective of whether or not all the children attend school, is that it is the responsibility of the State to provide this basic service.

When basic education is restricted to the specific age group, the children in the relevant age group represent the need variable. Taking the school age children variable enables the provinces to provide education for all

3. This also applies to the provision of public services by municipalities. For a description of some of the factors that may influence expenditure variations, see section 8 below.

4. For a comprehensive discussion of the PES formula for education, see FFC, *Submission for the Medium-Term Expenditure Framework 2004-2007*, April 2003.

the eligible children, assuming no repetitions. However, when there are repetitions which result in persons over 17 years in age accessing the education system, the school-age variable ceases to represent potential need accurately. Actual enrolment is a variable representing the actual population accessing the service. From this point of view, actual enrolment rather than the population in the age group seems to have greater relevance in determining the entitlements of the provinces.

The appropriateness of enrolment rather than population in the age group ensures the right incentive structure in the transfer system. When actual enrolment is used for distribution, provinces have the incentive to increase school enrolment in order to gain a larger share of funds. Use of age group population in the formula does not increase the incentive to expand enrolment.

Another notable feature of using the age group population for distribution of funds for education is the inequity implicit in it. An important disadvantage of provinces with greater concentrations of poverty is that more children tend to repeat grades, and school enrolment would have a higher proportion of children above 17 years. Use of age group population does not take into account the cost of educating these children and would therefore be biased against the disadvantaged provinces

Under these circumstances, there is no case for including the school-age variable in the PES formula, let alone assigning it the double weight of the enrolment factor. Besides providing the wrong incentives, it is clearly inequitable and needs to be corrected. Even if one considers that the number of “out of age” learners is no longer significant, the fact still remains that the school age population is not the biggest cost driver in education. Rather, issues such as learner-educator ratios and other quality variables are more important cost drivers. Thus the double weighting of the school age cohort is not justified, especially when the reason is that the school age cohort acts as a stabilising variable for unreliable enrolment numbers.

The higher cost of educational attainment of children in provinces with a larger concentration of the poor is obvious. This is because educational attainment is a function of, inter alia, a number of factors such as parental education, health status, and nutritional intake of the children.

Before concluding the discussion on the education component, it is important to refer to the inclusion of early childhood development (ECD) funding in the PES formula for education. The prevailing conditional grant funding for ECD will cease by the end of 2003/04, and the allocations will be included in the PES education allocation. As was recommended by the FFC in its Submission for the Division of Revenue 2002/03, this would require that the amount available under the equitable share for education should be augmented by at least the same volume in real terms as is incurred under the conditional grant at present.

A further issue with respect to the provision of basic education relates to adult basic education and training. The Commission submitted a separate set of comments in response to the norms and standards for adult basic education and training as requested by the department of education.<sup>5</sup>

5. FFC Comments on the Draft Norms and Standards for Funding Adult Basic Education and Training, February 2004.

### 3.1.1 The Financing of Learner Support Materials

An important consideration in the provision of quality basic education is ensuring that learners have equitable access to learner support materials (LSM). The FFC is currently involved in a research project to investigate the provisioning of LSM, and the preliminary results suggest that there is a need to engage in more detailed studies of this matter. The results highlight that there is inadequate and erratic expenditure on LSM, even though the expenditure data that has been used so far is aggregated at the level of the provinces.

Although allocations for the medium term indicate signs of increased commitment of funds to LSM, historical expenditure and allocation patterns reflect expenditure that is less than the benchmarks set by the Norms and Standards for School Funding (1998). The following are key areas of concern:

- Between 1995 and 1999, data from the Department of Education indicates that expenditure on LSM was erratic in the majority of provinces. Furthermore, per learner expenditure was in general below the per learner benchmark of R100 (annually reviewed according to the CPI) set in the Norms and Standards for School Funding (1998).
- Expenditure between 2001 and 2003 shows marked improvement per learner, although allocations by Provincial Education Departments (PEDs) to individual schools still showed inadequacies in some provinces. Out of three provinces analysed at school and district level, namely Free State, Eastern Cape, and Western Cape, per learner allocations for 2002/03 to schools in the Eastern Cape and Western Cape were very low.

The expenditure/allocation data provided by the PEDs needs to be viewed with caution. Depending on the data that is examined, differing outcomes of per learner allocations/expenditure emerge. The school level data represents allocations made by PEDs on the basis of requisitions sent to them by individual schools. Allocations do not necessarily reflect the value of requisitions. There could be various reasons for this, including the inability to make requisitions on the part of the school or lack of capacity at the PED level to deal with many requisition forms from individual schools.

The durability and lifespan of textbooks may also contribute to the erratic expenditure on LSM at school level. Schools might be ordering fewer textbooks because the available textbooks are still usable. The years where there are sharp increases in expenditure may indicate years where many new textbooks were purchased. It follows that an examination of the numbers is not enough. Information on buying cycles (that is, the average lifespan of a text book in the system) is a significant factor that can influence a school's choices.

An examination of actual outcomes as opposed to norms and standard targets for "equitable" and "fair" per learner expenditure needs to be carried out. An understanding of equity issues in education also requires further information on how learner support materials are distributed among schools.

The FFC will extend its research and conduct a more focused study that will examine LSM issues at selected

schools in a number of provinces to get a clearer understanding of their expenditure choices. This study will go beyond an examination of PED expenditure figures and will assess factors influencing decisions of individual schools on allocations to LSM and issues relating to delivery, cost of materials, and supply chain factors.

## 3.2 The Health Care Component

The formula for the health component is designed to enable provinces to provide basic health care services. The formula has two components: (i) population covered by the medical aid support ( $P_{hi}$ ) and (ii) population without the medical aid support ( $P_{wi}$ ). The volume of transfers for health is determined on the basis of the two variables, with the latter variable weighted four times more than the former. Thus, the PES formula for health is:

$$(P_{hi} + 4 P_{wi}) / \sum_i (P_{hi} + 4 P_{wi})$$

The data on population with and without medical aid support is taken from the 1995 household survey and applied to the census population estimates.

In the formula, population is the only factor used for allocating resources under the PES formula for health care expenditures, but as noted the population without medical aid is weighted four times. The reasoning behind this is that population without medical aid is likely to use four times the public health facilities provided by the provinces as compared to those with medical aid support. This is, however, based more on judgment than on any objective survey information. The formula does not adequately capture the differences in the use of public health facilities due to differences in the proportion of aged, children below five years, and women in the reproductive age group. A survey to quantify the intensity of use of public health facilities could be undertaken to design the variable and weighting system. The formula also does not consider the possibility of economies of scale or unit cost differences among the provinces resulting from population density.

## 3.3 The Social Development Component

Social development is the third important component of the PES and is weighted at 18 percent. It is different from the education and health components in that the bulk of the social development component is a transfer item in the form of grants rather than a component intended to provide services. In addition, the transfers are means-tested and the role of the provinces is to administer them. The proximity to the

population and their administrative capacity to implement the programmes are the reasons for assigning the role to provinces.

This component of the PES has two elements. The first weighs transfer payments to identified groups, namely the elderly, disabled, and children. The weights for the target population groups are determined according to the historical distribution of expenditure on different grants. The second element is the population in the lowest two quintiles of income distribution determined on the basis of the 1995 Income and Expenditure Survey.

The FFC has previously recommended that social security grants should be budgeted for and funded from a national level.<sup>6</sup> Government is in the process of establishing a National Social Security Agency, which will be responsible for the payment of social security grants. While the Agency is being set up, it would be important for the social security grants component of the PES to be converted into a conditional grant, so as to avoid the crowding out of other provincial service delivery mandates.

### 3.3.1 Financing Welfare Services

An issue that arises with the shifting of the administration of social security grants from provinces is what happens to the financing of the welfare services element of the social development component. To follow up on this matter, the FFC indicated in its Submission for the Medium-Term Expenditure Framework 2004–2007 that there will be a need to investigate what actually constitutes the basket of welfare services, how the financing mechanism is determined, and who actually delivers the services. The FFC subsequently followed up on these observations.

This entailed conducting an audit of the current welfare services and an investigation of what the norms and standards for these services are, and investigating current expenditure trends for welfare services and comparing these with what other countries are spending on similar services. The exercise also assessed whether provinces actually apply consistent means tests to the beneficiary groups of these services.

The preliminary results of the project indicate that South Africa's expenditure on social welfare services as a percentage of GDP compares favourably with countries at a similar level of development, such as Mexico. Provinces are also unified on what they consider to be social welfare services. These include services for women, children, youth, the elderly, and persons with disabilities. Provinces also have programmes for people living with HIV/AIDS, prevention of substance abuse, poverty alleviation, and offender and victim empowerment. However, provinces hold different views on whether beneficiaries of social welfare services should be subjected to means-testing.

Provinces also hold different interpretations on the financing policy for non-governmental organisations, and some provinces are not even sure whether such a policy exists. Evidence also indicates that non-governmental organisations working on social welfare services are dependent on government for a

6. For a more detailed discussion on the social development component, see FFC, *Submission for the Medium-Term Expenditure Framework 2004–2007*, April 2003.

substantial amount of funding. Information on the proportion of individuals benefiting from social security grants who are also beneficiaries of social welfare services is non-existent in most provinces, and this makes coordination of the two programmes difficult to achieve.

The following are the areas that the research project will focus on:

- Historical trends with respect to social welfare services provision and spending;
- The contribution of other departments such as health and education to social welfare service delivery; and
- The role of local government in the provision of welfare services programmes.

### 3.4 The Economic Activity Component

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The economic activity component carries a weight of 7 percent and is distributed among the provinces on the basis of the share of remuneration of employees. The component is a proxy for provincial tax revenue. Creation and maintenance of physical and social infrastructure depends on economic activity and the component is meant to support this requirement.

There is no clear rationale for using remuneration data as a means to determine allocations. With the new estimates of Gross Domestic Product per Region (GDPR) available, the replacement of remuneration with GDPR should be considered if Government chooses to maintain the economic activity component in its current form.

However, using economic activity as a proxy for infrastructure maintenance is problematic as it is bound to be regressive. High-income provinces have greater economic activity and naturally qualify for greater shares. However, infrastructure maintenance expenditure requirements depend on factors such as the volume and type of infrastructure and its vintage rather than on the remuneration of employees or GDPR. A more appropriate way to design this component is to estimate the maintenance requirements for roads, buildings, and other relevant infrastructure that the government is required to provide, and then allocate accordingly.

### 3.5 The Basic Component

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Each province receives funds for this component according to its share of the population. There is no problem with this component since the population is an important indicator of need.

## 3.6 The Backlogs Component

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This component takes into account capital (backlogs) needs in education and health and includes a ruralness factor. The information for the education backlog is drawn from the Schools Survey of Needs and for the health sector from the 1998 MTEF Report on hospital recapitalisation. The information used for determining the shares is not up to date.

In the case of dealing with infrastructure backlogs, it is necessary to make a detailed assessment of the capital expenditure requirements, taking into account the constitutional obligations of the provinces. A detailed assessment of infrastructure backlogs based on a scientific investigation of the requirements of different provinces should be the starting point for determining the backlogs and for phasing its financing over a period of time. It is necessary to work out a conditional grant programme for this to ensure that the funds allocated are actually spent on eliminating infrastructure backlogs.

In this respect, the FFC has been working on a model for the equitable sharing of infrastructure backlogs conditional grants. This is discussed in section 5.2 below.

## 3.7 The Institutional Component

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The Institutional Component of the PES formula constitutes five percent of the total PES transfer and is given in equal amounts to each of the provinces. The underlying logic is that there are fixed costs associated with establishing the institutions for provincial governance and delivery of public services. There is also an underlying assumption that these institutions are in the nature of public goods and the cost of establishing them remains the same irrespective of area or population. There are however very few services of a pure “public good” nature provided by provincial governments, and most of the services are quasi-public in nature. Thus, in respect of most of the public goods provided by provincial governments, the total cost of providing the service is a positive function of the population, though in many cases the per capita costs may decline with the volume of output for some range. It may therefore be desirable to have the institutional component determined as a fixed proportion of all other components.

## 3.8 Proposals: PES Formula

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- The weights assigned to the different components in the PES formula need to be revised to take account of the changing priorities and changing composition of components in the PES formula.
- The Commission re-iterates its previous proposal (April 2003) that the formula used to allocate the education component of the equitable share be revised to end the double weighting of “school age” children. In this respect, the department of education should ensure that reliable school enrolment data is collected regularly.
- The Commission notes that ECD will be incorporated into the education component of the PES from 2004/05. The FFC proposes that in view of the need for the provision of ECD, the education component should be augmented at least by the full amount of the current conditional grant, given the need for phasing in the programme.
- In the case of health care services, the formula should be revised to take account of the gender and age profile of the population in order to reflect differential needs for health care services. Furthermore, the department of health should ensure that data on healthcare utilisation rates for different population groups is regularly collected.
- The social development component should be removed from the PES formula, and during the transition period towards the full establishment of the National Security Agency, all grant allocations for social security may be funded via a conditional grant mechanism or any other appropriate funding mechanism determined on a case-by-case assessment of each province’s capacity and experience in the administration and payment of such grants. In addition the national Social Development Department must ensure that adequate measures are in place to monitor the proper administration and payment of social security grants.
  - In order to ensure minimum disruption to service delivery, government should ensure that the *status quo* with regards to the financing and delivery of welfare services in provinces should remain until such time that the transition to the National Social Security Agency is complete.
- In the absence of significant own revenue from provinces, the economic activity component of the PES formula should be defined to provide for the maintenance expenditure requirements of social and public infrastructure and should be redesigned accordingly.

## SECTION 4

# Equity and efficiency aspects of the PES formula<sup>7</sup>

Equity in intergovernmental transfers implies enabling provinces to provide a normatively determined standard of services at a given tax price. While the prioritisation and choice of public service bundle lies with the provinces, the transfer system provides them with the resources to provide an appropriate mix of a given normative standard of services.

The standards of public services in provinces can vary if there are differences in the ability to raise revenues or in unit cost of public service provision. In the case of South Africa, the provinces do not raise significant revenue and equalisation does not involve a tax effort component. If there are no differences in the unit cost of providing public services, horizontal equity is ensured once the expenditure per unit of beneficiary is equalised. However, there are significant cost differences across the provinces due to reasons beyond their control, and the transfer system should offset these as well.

An efficient transfer system is one that minimises adverse effects on the fiscal performance of the provinces. If the transfers are related to actual expenditures rather than expenditure needs of provinces, then such a transfer system can encourage provinces to incur wasteful expenditure. Similarly, a transfer system designed to meet the shortfall in actual revenues can encourage poor tax effort. In South Africa, however, the latter

7. For a detailed technical discussion of this section, see Annexure A.

is not possible as the provinces do not exercise significant revenue-raising powers. However, there can still be disincentives on the expenditure side.

Considering that there are significant horizontal inequalities in South Africa, it is important that fiscal disabilities of provinces should be offset. The fact that the provinces currently exercise minimal revenue-raising powers implies that the standards of public services will vary across provinces mainly on account of differences in the allocation of transfers – both the PES and conditional grants. It may also be due to differences in the unit cost of providing public services for reasons beyond their control (known as cost disabilities) and differences in the productivity of public service provision.

If the PES formula is designed to take account of cost disabilities as the costed-norms approach previously proposed by the FFC set out to do, differences in public services would be attributable to conditional transfers and the efficiency of the provinces in providing public services. In such a system, equity would be well served. While this has been kept as a long-term objective, Government has not adopted the approach. In this section, an attempt is made to evaluate the prevailing PES formula in terms of achieving the overall objective of equity.

Examination of all transfers received by different provinces over the period from 1997/98 to 2001/02 in both per capita terms and as a proportion of GDP shows that when plotted against per capita GDP, by and large the richer provinces received relatively lower transfers than poorer provinces. This is also true of the PES. In that sense, it may be easy to conclude that in broad terms the objective of equity is served through the formula.

The econometric analysis of revenues and expenditures confirms the above finding. The expenditure of provinces is negatively related to per capita GDP. However, it has a positive relationship with urbanisation and is inversely related to the density of population. In other words, provinces had to provide for the cost disabilities which were not taken into account in the formula.

The expenditure of provinces, however, was not significantly related to the poverty ratio. Considering the fact that the unit cost of providing public services such as education and health to the poor is higher, the formula would need to be adjusted to take this into account. Further analysis also shows that inequities arise by not taking into account cost disabilities arising from urbanisation and density of the population. This is particularly so in the case of education and health care services.

## 4.1 Proposal: Equity and Efficiency Aspects of the PES Formula

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- The PES formula should be revised to account for relevant cost disabilities of provinces.

## SECTION 5

# The Use of Conditional Grants in the Transfer System

### 5.1 A Review of the Conditional Grant System

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Over the past six years, a range of conditional grants have been introduced into the South African intergovernmental fiscal relations system. With the conditional grants still in an embryonic stage, there are challenges that the country faces to make the system more efficient and effective.

Firstly, in designing conditional grants, it is necessary to ensure that the conditions do not create bottlenecks that stifle spending at the subnational level. Overly strict conditions may embody negative incentives by preventing subnational spheres from achieving the purpose in more efficient ways. The conditions should be aligned with subnational governments' priorities and local conditions. Thus, broad-based conditions rather than prescriptive approaches to conditionality are often preferable.

Secondly, the use of matching grants is often preferred over non-matching grants. Matching grants instil some sense of ownership and buy-in at subnational level in the implementation of conditional grants programmes. The fact that different subnational governments have different revenue-raising capacities to finance services suggests the appropriateness of different degrees of local finance (matching ratios). Matching

conditional grants tend to be most stimulative because of an added price effect (that is, matching rates can be made to vary across jurisdictions according to fiscal capacity). However, the matching approach can be quite demanding in terms of data.

Thirdly, the design of transfers should provide incentives for sound fiscal management and should discourage inefficient practices. For instance, there should be no transfers specifically for financing the deficits of subnational governments. Movement of resources, such as funds, staff, and technology, should also be allowable within the transfer mechanism. This would ensure that resources are used where they are most needed.

Fourthly, in a multi-layered fiscal system, where each sphere of government is autonomous and has the constitutionally guaranteed powers to set its own priorities, draw up its budgets, and elect its leadership, the use of explicit contracts/agreements between the transferring and recipient governments is necessary. Ideally such agreements should set out full provisions for addressing disputes over non-compliance or spending on programmes that do not form part of the specifications of the grant.

Finally, the operational environment should be enabling. It should allow some scope at the subnational level to make decisions. This scope includes the ability to make decisions on a number of areas, including human resources, procurement and tender processes, and financial management.

### 5.1.1 Key issues emerging with respect to conditional grants in South Africa

The following issues have emerged from the assessment of the conditional grants system in South Africa:

- A number of interventions have been introduced through the Division of Revenue Act to address the weaknesses associated with the implementation of provincial conditional grant programmes.
- The legislative framework assigns the role of compliance monitoring to transferring national departments, but the monitoring capacity of some of the departments is weak.
- By the same token, provinces do not have adequate skills capacity to administer conditional grant programmes.
- The conditional grants system is not designed in a manner that encourages decentralised decision-making and efficiency in spending. Decision-making is centralised in the national sphere. There is therefore little flexibility for provinces to respond to their specific circumstances.
- In addition to design challenges, the effective implementation of conditional grant programmes is hampered by challenges in the operational environment such as issues around tender processes, human resources, allowing decision space at provincial level, and expeditious finalisation of business plans for conditional grants.

Some of the preliminary conclusions are as follows:

- The mobilisation of resources within the conditional grant system may require a review of the policy on the shifting of funds from provinces that are not spending their conditional grants to provinces that are spending.

- There is a need for formal agreements between the national sphere and the recipient provinces in the South African conditional grants mechanism. This may enhance accountability to agreed standards in each province.
- There is a case for relaxing some of the stringent conditions for different conditional grants, especially those that seek to ensure adherence to national norms and standards. This can allow provinces some level of decision-space, innovation, and creativity in the spending of these grants. While it is important to recognise the political objectives associated with conditional grants, it may also be necessary for the individual circumstances of provinces to be taken into account when designing the conditions of the grants, and in the process do away with the “one-size fits all” approach to conditionality.

## 5.2 Equitable Allocation of Capital Grants for Infrastructure

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### 5.2.1 Background to the FFC Capital Grants Model

In the 1999, the Financial and Fiscal Commission began to formulate a provincial capital grants scheme model following concerns raised by national and provincial parliamentary committees and provincial treasuries. The Parliamentary public hearings on the Intergovernmental Fiscal Review in October 1999 highlighted many of the concerns. Among others the following were raised:

- The ongoing rate of capital spending by provinces is insufficient to address capital backlogs and on-going demands for capital.
- There was an overall decline in the funding of capital expenditure from 5.3 percent of provincial budgets in 1996/97 to 4.2 percent in 1998/99.
- Provinces have limited or no access to capital markets.
- Provinces have very small or non-existent own revenue sources.
- Provinces have inherited widely differing levels of public infrastructure required for the delivery and provision of constitutionally mandated basic services (CMBS) in health, education, welfare, housing and transport.

Although Government has attempted to address these issues by incorporating a “backlogs” component of 3 percent in the current equitable share formula, no evidence has emerged to show that infrastructure backlogs have been reduced. This is mainly due to expenditure pressures from non-capital spending. The FFC responded to these concerns by recommending for the 2001-2004 MTEF Cycle that national government should supplement provincial capital spending through a conditional grant directed at addressing provincial infrastructure backlogs. This recommendation was accepted by Government and funds were made available for this purpose.

In making its recommendation, the FFC was cognisant of the fact that there exists no mechanism for the equitable and objective allocation of the capital grant pool to provinces. Thus, in its Submission for the

2001–2004 MTEF Cycle, the FFC presented a conceptual version of a capital grants model that may be used for this purpose. In its response, Government recognised the need for an equitable sharing mechanism for allocating provincial capital grants.

However, Government pointed out several shortcomings in the FFC's conceptual capital grants model, the details of which can be found in the Budget Reviews for 2001 and 2002. Many of the problems in the conceptual model concerned issues of data. Over the past eighteen months more data has become available and the FFC has restructured the initial conceptual model and addressed many of the concerns raised by Government. The development of the final version of the capital grants model went through a rigorous consultation process with all relevant stakeholders and providers of data and information.

The rationale for a provincial capital grants scheme has been extensively discussed in previous FFC submissions. Recent debates and discussions in the Budget Council and Parliamentary finance committees have also underlined the need for the current intergovernmental fiscal system to take account of the lack of progress in changing the level and direction of provincial spending on infrastructure backlogs. This has taken on a greater urgency as Government places greater emphasis on using infrastructure investment as a catalyst for economic growth, job creation, enhanced delivery of basic services, and poverty alleviation in the medium to long term.

In the short term, the absence of provincial borrowing powers and the current low levels of provincial own revenues mean that conditional grants remain the only alternative for dealing with provincial infrastructure backlogs and current infrastructure needs.

The purpose of the conditional grant should be to allow provinces to build up their capital stocks to an acceptable norm over time. Many factors influence the determination of an acceptable norm. For the FFC, the infrastructure needed to progressively provide constitutionally mandated basic services is a key determinant. This factor should, however, be balanced against constitutional considerations such as those listed in Section 214(2)(a-j).

The first version of the model was completed in 2001 and was subsequently refined and further developed from November 2002 until June 2003. Since then, further work on the model – now known as the Provincial Capital Grant Model (PCGM) – was undertaken. The full technical report on the Model is provided in Annexure B.

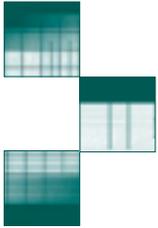
The work focused on programming the PCGM and its input database within Excel spreadsheets and running capital grant simulations for the provinces. A Manual for policy-makers that describes the workings of each formula within the Model has also been developed. The Manual includes detailed information on the construction of the database and illustrative simulations. Thus, it provides the policy-maker with a complete guide to using the Model and running simulations based on different policy parameters.

To conclude, the proposed Provincial Capital Grant Model attempts to achieve the twin goals of raising the overall amount of public capital formation and eliminating the backlogs arising from pre-1994 policies. It does this through a grant formula with two components: an equal per capita component intended to raise the rate of economic growth in the long run, and a component that raises the relative amount of capital formation in the poorest provinces and thereby redresses the inequities of the past. Once the domestic backlogs have been eliminated, the intergovernmental fiscal system will have been “normalised” in the sense that the inequities of the past will have been corrected. What will remain is the task of raising the overall rate of capital formation in the long run.

### 5.3 Proposal: Provincial Infrastructure Grant

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- Government should incorporate the backlogs component of the PES formula into the basic component and a separate conditional grant should be set up for financing capital infrastructure. This should be allocated to provinces using the FFC’s proposed provincial capital grants model (see Annexure B for details).



# Review of the Local Government Equitable Sharing System

**[Part 2]**



## SECTION 6

# Analysis of Funding Windows in the Local Government Equitable Share Formula

The FFC is in the process of reviewing the local government equitable share (LES) formula. It is participating in Government's LES review process, which aims to provide a comprehensive review of local government transfers for the 2005 budget. (For details of the FFC's proposals for the review, see Sections 7 to 11 below.)

The FFC has previously recommended that the local government revenue base should be measured directly. It is clear that the data to support this will only be available in the next five to eight years. For example, data from municipal valuation rolls will only become available in 2008 at the earliest owing to phasing-in provisions in the Property Rates Act, and two other major revenue sources – namely regional levies and electricity distribution surpluses – are under review. While data on municipal service costs may become available in the next few years, it would be unwise to suggest major changes to the formula before it is possible to develop reasonable measures of both expenditure needs and revenue-raising capacity.

There has been a measure of stability introduced into the LES allocations since 2002/03 owing to the publication of three-year allocations, and it would be unwise to introduce an entirely new formula in the interim period. It then becomes important to assess and (if necessary) revise the current formula to ensure

that it results in allocations that satisfy the principle of equity and that conform to sound intergovernmental fiscal relations principles.

In order to assess the equity of allocations, the FFC is conducting empirical evaluations of the existing LES allocations, including analysis of the distribution of per capita allocations across municipalities with different characteristics.

With respect to conformance with principles of intergovernmental fiscal relations, it is important for the FFC to provide on-going comments on the conceptual development of the formula. For example, Government has been introducing “funding windows” into the equitable share formula, which appears to be undermining the transparency and original intention of the formula. This section provides an analysis of this practice.

## 6.1 The Use of Funding Windows in the LES Formula

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In the Budget Review each year, Government lists the equitable share and conditional transfers to local government. Government has used the term “equitable share and related” to refer to allocations made through the equitable share formulae as well as other transfers that fund local government functions performed by other spheres of Government for historical reasons. For example, the national Department of Water Affairs and Forestry operates water schemes in some municipalities. In 2004/05, the total “in-kind” transfer for water schemes is set at R858 million.

The FFC has not commented on the practice of including such transfers under the broader term “equitable share and related” as these transfers are intended to be transitional until such time that the staff and funding are transferred directly to municipalities.

However, other funding windows that are not necessarily temporary have found their way into the equitable share mechanism. These are the development node, free basic services, and free basic electricity allocations, as described below.

### Nodal allocations

Since 2002/03, Government has allocated additional (non-infrastructure) funding to the 13 rural and 8 urban development nodes, and is including this in the equitable share allocation. Additional funding for the nodes has been allocated in the current MTEF Cycle as follows:

- 2004/05: R228m
- 2005/06: R244m
- 2006/07: R244m

The rural nodes receive 65 percent of this allocation and the urban nodes 35 percent, and it is being channelled through the S (Services) component of the formula. The formula for the S component is used to distribute the allocation amongst the development nodes.

In its Submission for the Medium-Term Expenditure Framework 2004-2007, the FFC recommended that this nodal allocation should not be included in the equitable share allocation, but should rather be a separate (unconditional) grant. This is because the equitable share formula was intended to apply uniformly (and equitably) to all municipalities, and issues of national priority are best dealt with through national grants.

The FFC's concerns around the nodal funding window also apply to other funding windows, as outlined below.

### Free basic electricity (FBE) and free basic services (FBS)

In 2002/03, Government increased the equitable share to local government to take account of the need for municipalities to fund free basic electricity and water services to low-income households. In effect, this "topped up" the equitable share, which was still distributed through the formula for the S component.

This changed for the 2003/04 fiscal year. Government introduced two separate allocations, one for free basic electricity / energy and the other for free basic services (water, sanitation, and refuse removal). The basis for determining the size of each funding envelope has not been made explicit.

Each envelope is distributed according to a combination of the S formula and 2001 Census data on access to electricity supply and to water, sanitation, and refuse removal services. The formula for the FBS envelope is more complicated than the FBE envelope, as it takes account of two groups of services (water & sanitation and refuse removal) and is adjusted for the powers and functions of district and local municipalities.

The combined FBE and FBS allocations rise from 25 percent of the total equitable share allocation in 2004/05 to 35 percent in 2006/07. As different formulae from the S component formula are used, this has significant implications for the distribution of the equitable share allocation.

There is a duplication between the S component, which is intended to fund the operational costs of basic delivery to poor households, and the FBE / FBS windows, which are also meant to fund basic service delivery to the poor. While it is clear that the FBE and FBS windows were designed to fund the operational expenditure of infrastructure already in place, linking infrastructure with equitable share allocations through the establishment of two new funding windows is problematic. This is because the distributional outcomes for the overall LES allocation are unknown, and because the relationship between the (conditional) infrastructure grant and unconditional equitable share is a complex one. This relationship is explored in section 11 below.

Table 1: Local Equitable Share Funding Windows

Window	Stated funding purpose	Criteria for distribution	2004/05 allocation (R million)
R293 grant	Fund R293 staff transferred from provinces to municipalities	Historical distribution of R293s; decision about the number of R293 staff allocated to the municipality	263
I grant	Fund institutional & governance requirements	Monthly average per capita income and total population	473
S grant	Fund operational costs of basic services in poor households	Number of poor households	4746
Nodal allocations	Fund projects identified in the local ISRDP and URP planning exercises	Rural 65%, urban 35%; Number of poor people in nodes	228
Free basic services (water, sanitation, refuse)	Fund operational costs of a range of services (excluding electricity to poor households)	Average between number of poor hhs and hhs with basic services backlogs	1467
Free basic electricity	Fund operational costs of electricity provision to poor households	Average between number of poor hhs and hhs with basic electricity backlogs	500
<b>Total Equitable Share</b>			<b>7677</b>

Source: Annexure E, *Budget Review*, 2004.

## Guaranteed amounts

A “guaranteed amounts” mechanism has been put in place to protect municipalities from negative shocks due to changes in the formula. Municipalities are guaranteed at least 70 percent of their total LES allocation received in the previous year.

The calculation is done as follows:<sup>8</sup>

- The formula-driven allocation for each municipality is compared to the guaranteed amount for that municipality;
- Where the guaranteed amounts are greater than the formula-driven allocations, the guaranteed amounts become the LES allocations;
- The sum of the guaranteed amounts is then removed from the grant resource pool;
- The beta factor associated with the S component is used to derive the distribution of the residual, unallocated funds between municipalities.

8. The method for calculating the guaranteed amounts is provided in P. Whelan, “The Equitable Share,” Idasa Occasional Paper, 2004.

A municipality cannot therefore calculate its own individual allocation without reference to the allocations calculated for all other municipalities.

In principle, the “guarantee” mechanism is sensible. Indeed, the FFC recommended that such an approach be used in phasing in changes to the PES formula, although it suggested a much higher guarantee threshold.<sup>9</sup> What is noteworthy is that the guarantee mechanism adds an additional complication to the formula, which makes it difficult for anyone outside Government to understand the workings of the LES formula.

### 6.1.1 Assessment: Funding Windows

Government is in the process of consolidating the numerous conditional grants for local government into two funding streams, namely infrastructure grants and capacity-building / restructuring grants. It would seem that there is still concern within Government that municipalities will not spend these allocations appropriately, and the introduction of the new funding windows can be seen as a way in which to introduce conditionality into the equitable share mechanism implicitly.

The equitable share transfer is unconditional. However the opposite impression is sometimes created by practices such as funding windows and by guidelines and information updates issued to municipalities by national government. Indeed, recent research conducted by the FFC for its project on the pledging of equitable share revenue indicates that many municipal councillors and officials are under the impression that their municipalities are accountable to national government for how equitable share funding is spent.

Thus, there are a number of concerns that need to be highlighted with respect to the use of funding windows in the equitable share formula:

- There is no indication from Government that these “windows” are temporary;
- There is no information provided on the basis for determining the global allocation to each funding window, or for that matter the S and I components. This means that the proportion of a component or funding window can change significantly from one year to the next with little explanation. This differs from the weighted components of the Provincial Equitable Share allocation.
- There is a duplication between the S component and the FBE / FBS windows, both of which are meant to fund basic service delivery to the poor. If Government wishes to establish a link between operational expenditure and existing infrastructure, as is being done through the FBE / FBS windows, this should be effected through explicit policy instruments rather than through funding windows.

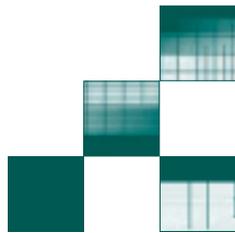
## 6.2 Proposal: Funding Windows

- Government should avoid the use of funding windows in the equitable share formula.

9. FFC, *Recommendations 2001-2004 MTEF Cycle* (May 2000).

## SECTION 7

# Proposals for the Review of the Local Government Equitable Share Formula



Since 2000, the FFC has explored the conceptual framework for the LES formula, and has proposed a number of principles that should underpin the LES framework. In addition, the Commission has conducted research on certain aspects of the LES formula, such as the measurement of revenue-raising capacity and the relationship between the LES and municipal infrastructure formulae.

Sections 7 to 11 outline the principles of the framework previously proposed by the FFC, present the results of the research conducted to date, and make further proposals that should inform the review of the LES formula. It is structured as follows:

- Proposed framework for the local government equitable share formula
- Proposed principles for components of the formula:
  - Measurement of revenue-raising capacity
  - Measurement of municipal service costs
  - Measurement of institutional capacity maintenance
  - Issues regarding the relationship between the LES and municipal infrastructure formulae

## 7.1 Conceptual framework for the Local Government Equitable Share

Section 214(2) of the Constitution states that the division of nationally collected revenue among the national, provincial, and local spheres of government should be informed by, among other factors:

- The need to ensure that provinces and municipalities can provide basic services and perform the functions allocated to them [214(2)(d)];
- The fiscal capacity and efficiency of the provinces and municipalities [214(2)(e)];
- The developmental and other needs of provinces and municipalities [214(2)(f)]; and
- The obligations of provinces and municipalities in terms of national legislation [214(2)(h)].

Based upon these constitutional requirements, the Commission proposed a formula in its Submission for the Division of Revenue 2002/03. The formula, which is consistent with the FFC's formula for provinces and similar to the local government formula put forward by National Treasury in 1997, is as follows:

$$LES = S + B + I + T + m$$

Where

LES	Local government equitable share allocation
S	Component to support the delivery of basic municipal services
B	Component to fulfil other constitutional and legislative responsibilities
I	Component to finance core administrative functions
T	Component for tax capacity equalisation
m	Spillover grant to provide finance for services with intermunicipal spillover effects

This Submission does not address issues related to the B and m components for the following reasons:

- The *spillover* grant has to some extent been addressed by the existence of regional levies, which have traditionally funded spillover projects. The levies are under review at the moment, and it would be premature to address the issue of spillovers until the review is complete;
- The *basic* component should provide the resources to perform municipal functions that are in addition to basic municipal services. The first priority is to estimate the service costs for basic municipal services, hence the benchmarking of “other” functions is a long-term objective.

In what follows, issues and proposed principles relating to the S, I, and T components are presented.

## SECTION 8

# The S (Services) Component

### 8.1 Background

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The Constitution and subsequent legislation have given municipalities in South Africa responsibility for the provision of a substantial number of public services. Section 214 of the Constitution makes it clear that the distribution of the equitable share to local government must take account of the fiscal capacity of municipalities and the need to ensure that municipalities are able to provide basic services and fulfil the functions allocated to them.

The Constitution thus points towards a system of unconditional grants to municipalities. To meet constitutional requirements, the size of each municipality's grant allocation would be determined by *an estimate of the minimum amount of money needed to provide basic service levels for those municipal functions assigned to that municipality*, minus the amount of money each government could be expected to raise from local sources at a "normal" rate of revenue effort. The phrase in italics represents a definition of what economists generally refer to as the "expenditure need" of municipalities.

It is important to understand the extent to which expenditure needs may vary from one municipality to another, as there may be factors influencing service costs that are beyond the control of municipalities. These factors should be reflected in the local government equitable share formula. The FFC has initiated a

project that seeks to contribute to the review of the overall Local Government Equitable Share formula by identifying the factors influencing the costs of delivering each basic municipal service.

This section presents the key principles that should inform the assessment of expenditure needs of municipalities and outlines the methodological approach of the FFC.

## 8.2 Principle for assessing Municipal Service Costs

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In its Submission for the Division of Revenue 2002/03, the Commission noted that there is only a single basic standard of delivery for every service. Instead, different types of service delivery should be specified within each basic level of service, based on the technology that is appropriate in different circumstances.

For instance, sanitation options range from ventilated improved pit latrines and septic tanks to water-borne sewerage. Population density is likely to be a significant factor in this respect: water-borne sewerage is advisable in built-up areas and areas close to sources of fresh water, while ventilated improved pit latrines are more appropriate in remote areas where sewerage works are not in close proximity. Methodologies need to be developed for each basic municipal service to take account of such factors.

The FFC therefore recommended that residents in a given jurisdiction have the right to a basic level of service provision. There will be different types of service delivery within the basic level owing to the nature of the technology required.

## 8.3 Measuring the Costs of Local Public Services: A Review of International Practice

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The FFC has been involved in efforts to develop a methodology that accounts for the differences in expenditure needs among municipalities. This section summarises the findings of a review of methodologies used in various countries.

### 8.3.1 Why Costs Differ

There are a number of reasons why the costs of providing a local public service may vary across local jurisdictions: differences in the quantity and composition of inputs necessary to produce the public service, differences in factor or input prices, differences in what might be called environmental factors, and differences in the socio-demographic composition of the local government population.

The inputs needed to produce various public services will depend in part on the underlying technology used to produce the service. For many public services, labour is the most important input. In countries where local governments set the wage rates of local government employees, the actual wage reflects both the preferences of local jurisdictions with respect to the type of employee they wish to hire, and characteristics of the labour market over which the local government has no control. It is only the portion of wage costs that are due to these uncontrollable factors that should be considered as part of the costs of the public service.

The amount and the type of resources needed to provide many public goods depends in part on the circumstances, including the location where the public good is produced and delivered. For example, a graded dirt road may be fully adequate in locations with relatively little rain, while a paved surface and regular maintenance will be required in locations subject to frequent torrential rainfalls.

Another factor that has been shown to influence the costs of some municipal services is population density. In some cases, higher density can lead to higher costs. Achieving basic fire protection will require more resources in places where buildings are close together and fires can easily spread. For other local public services, low density may result in higher costs. For example, providing potable water in a thinly settled, low-density community will necessitate the construction and maintenance of more pipes and require more pumping stations.

Economies of scale can also have a large influence on the costs of delivering local government services. For public services characterised by large “fixed costs” and relatively low operating costs, per capita costs generally decline dramatically as the scale of operation rises.

The extent to which high costs due to location-specific environmental factors should influence the allocation of grants is controversial. For example, if a village is located on the top of a mountain, the costs of supplying water will be particularly high because of the necessity of pumping the water up the mountain. If a grant formula fully reflects these extra costs, residents of this village will have no incentive to move away from this highly inefficient location.

### 8.3.2 Review findings

Throughout the world, a number of countries have established systems of intergovernmental grants designed to reduce fiscal disparities among both provinces and local governments. In practice, it is very common to find grants that are allocated among local governments based on differences in revenue-raising capacity. However, there are relatively few examples of grant formulas that explicitly account for differences among local governments in expenditure needs.

International experience clearly indicates that there is no single best methodology for estimating the expenditure needs of local governments. The methodology chosen in a particular country is influenced in part by the availability of data. Some countries, for example Australia, have chosen to measure expenditure needs

using a highly-data intensive methodology. In South Africa, comprehensive data on local governments is still quite limited. This suggests that any method used in South Africa to determine the costs of local public services will have to be relatively parsimonious in its use of data.

It appears that most, if not all, countries that have implemented grant schemes that include a measure of the expenditure needs of local governments have used a methodology that combines statistical analysis of local government data with the judgments of experts on local government finance and local government service delivery.

One common element in the methodologies used in most countries is the use of functionally disaggregated local government expenditure data. There appears to be a widespread recognition that calculations of the costs of providing basic public services must be built up separately for each local government function.

In developing a methodology for the measurement of local government expenditure needs, it is important that South Africa strive to develop a grant formula that is simple. The political acceptance of any allocation mechanism will be enhanced if the methodology is as straightforward and transparent as possible. In their efforts to measure local government expenditure needs, a number of countries have developed methodologies that are highly complex and difficult to understand.

## 8.4 Proposals: Assessing Municipal Service Costs

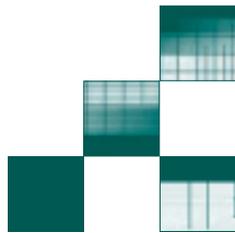
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Following from the discussion above, there are a number of proposals that can be distilled from the FFC's previous recommendations and from the international review of costing methodologies:

- The assessment of municipal service costs should be informed by the following principle:
  - Residents in a given jurisdiction have the right to a basic level of service provision. There will be different types of service delivery within the basic level owing to the nature of the technology required.
- As Government reviews the LES formula, it is suggested that the following principles should inform the development of the methodology for assessing municipal service costs:
  - In developing a measure of expenditure needs, municipalities should not be able to influence the magnitude of their expenditure needs through their fiscal decisions;
  - The methodology should not be too data-intensive;
  - A strategy that combines statistical analysis of data with expert opinion provides a realistic approach for South Africa;
  - Calculations of the costs of providing basic services should be built up separately for each local government function; and
  - The grant formula should be as simple as possible.

## SECTION 9

# The I (Institutional) Component



In dealing with institutional capacity needs, it is important at the outset to distinguish between the expenditure needs of capacity maintenance and capacity building.

*Capacity maintenance* refers to the operational maintenance of the minimum institutional infrastructure required for effective municipal governance and administration (the specific components of this are outlined in section 9.2 below). It would include expenditure on items such as councillor allowances and administrative overheads. Expenditure needs related to the maintenance of basic institutional capacity are best addressed through the I component of the local government equitable share (LES) formula, as the equitable share allocation is meant to fund (on-going) recurrent expenditure.

*Capacity building*, on the other hand, assumes that the minimum institutional infrastructure is not in place and needs to be established. The minimum infrastructure could include administrative buildings as well as the training of municipal officials so that they have a minimum level of expertise. As it is Government's aim for this minimum capacity to be established within limited time frames, capacity-building is best funded through the use of conditional grants that will eventually be phased out.

## 9.1 Overview: I Component of the LES Formula

Since its introduction in 1998, the local government equitable share formula included an Institutional grant, referred to as the I grant. The purpose of the I component is to assist in funding the basic institutional and governance arrangements of municipalities, and is designed to target municipalities with insufficient resources to fund their own administrative infrastructure.<sup>10</sup>

The formula for the I component takes account of two factors, namely a) average monthly per capita expenditure, and b) population of the municipality. The formula is as follows:

$$I_i = I_0 P_i^\gamma - 0.075 (y_i - 250) P_i$$

Where

$I_0$	A per capita I-component parameter that serves to determine the total amount of money allocated through the I component;
$P_i$	The population in the municipality $i$ ;
$\gamma$	A scale parameter that could take any value $> 0$ and $\leq 1$
$y_i$	The average monthly per capita expenditure in municipality $i$ . For values of $y_i$ below the stated monthly per capita floor of R250, the term $(y_i - \text{per capita floor})$ is set equal to zero.

The first part of the formula captures how the administrative costs of a municipality increase with population size. It assumes that these costs increase more slowly than population does, that is, a larger municipality has more costs, but not proportionately more than a smaller one.

Relatively high-income municipalities are considered to have sufficient revenue-raising capacity to finance the basic operations of government on their own. As metropolitan municipalities have relatively high fiscal capacity, they do not receive funds through this component of the formula.

During the 2004/05 financial year, R473 million is to be distributed to local municipalities through the I formula.<sup>11</sup> I allocations go to about two-thirds of all municipalities, but because the allocations are targeted to smaller jurisdictions, only a little over one-third of the nation's population resides in municipalities receiving I allocations.

In part because of the shifting of some important powers and functions to district municipalities, since 2002/03 Government has allocated funds to district municipalities using the I component formula applied to Category B jurisdictions.

10. National Treasury, *Budget Review 2004*, Annexure E.

11. District Management Areas are also eligible to receive I allocations.

## 9.2 Towards a definition of minimum institutional capacity

The starting point for defining the core institutional capacity required by municipalities is the legislative basis for municipal functions. The key laws in this respect are the Constitution (1996), Municipal Systems Act (2000), Disaster Management Act (2002), Municipal Finance Management Act (2003), and Property Rates Act (2004). In this section, this legislation is analysed with a view to distilling the key competencies required of local government.

### 9.2.1 Institutional framework

Section 152(1) of the Constitution provides a framework for the functions assigned to local government. It outlines the five key objects of local government, namely:

- (a) to provide democratic and accountable government for local communities;
- (b) to ensure the provision of services to communities in a sustainable manner;
- (c) to promote social and economic development;
- (d) to promote a safe and healthy environment; and
- (e) to encourage the involvement of communities and community organisations in the matters of local government.

Schedules 4B and 5B of the Constitution list the specific functions assigned to municipalities, which fall within the ambit of the “objects of local government” in Section 152 (especially 152(1)(b)-(d)).

In carrying out their constitutional mandate, municipalities must engage in a wide variety of activities that can be grouped into four categories, namely:

- Governance;
- Administration;
- Treasury services; and
- Service delivery.

Treasury services forms a separate category owing to the central role that own revenue plays in the local government sphere. In aggregate, municipalities generate over 90 percent of their own revenue, and most of this is from service charges for the so-called “trading services” (electricity, water, sanitation, and refuse removal). Service charges are collected from all residents, and if municipalities are to be financially viable, they are therefore required to establish and maintain comprehensive billing and collection systems.

The cost implications of service delivery capacity should probably be included in the S component, although this requires further study (see Section 8 above). However, the institutional infrastructure required to support overall service delivery (such as legal services) could be considered within the category of “administration”.

Using the above categorisation as its basis, it is possible to outline the responsibilities of local government within each category, namely governance, administration, and treasury services.

For example, with respect to the minimum legislated capacity requirements for Treasury services, the Municipal Finance Management Act requires every municipality to establish a budget and treasury office, and it is responsible for:

- Customer care and management;
- Collection of fees and rates;
- Cash, investment, revenue, debt, asset, and supply chain management; and
- The conducting of feasibility studies, where a municipality wishes to enter into a public-private partnership.

In addition, the Property Rates Act (2004) requires that municipalities prepare a single valuation roll, which must be updated on a regular basis. Municipalities must also develop a local rates policy, credit control policy, and tariff policy in consultation with residents.

### 9.2.2 Way forward: building on the legislative framework

There is a substantial legal framework in place that specifies the institutional responsibilities of local government. However, this does not provide a comprehensive list of institutional activities, as there are many necessary activities that municipalities engage in that are not specified in the legislation. For example, municipalities must have a personnel (human resources) administration, yet the establishment of this is not mentioned in the legislation reviewed above.

Using the legislative framework as a basis, the FFC will continue to develop the framework for defining core institutional capacity. This will include the development of a list of municipal activities that are necessary to meet legislative requirements, but are not necessarily specified in legislation. The study will also assess the average expenditure incurred by municipalities in carrying out their administrative functions. A key issue to consider is economies of scale. As municipalities vary considerably in population size, the study will examine average expenditure within various population bands of municipalities.

## 9.3 Re-thinking the I component of the LES formula

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Section 9.2 outlined some of the key institutional activities of municipalities in South Africa. Once the minimum institutional infrastructure of municipalities is determined, it remains to examine how this relates to revenue-raising capacity and whether the cost of providing the minimum infrastructure varies considerably amongst municipalities. These issues are considered in this section.

## 9.3.1 Formula components

### 9.3.1.1 Measurement of revenue-raising capacity

The FFC recommended in its Submission for the Division of Revenue 2002/03 that the LES formula should take account of revenue-raising capacity. Only the I component takes account of revenue-raising capacity directly through the use of the average monthly per capita expenditure indicator, but the I component makes up only 6 percent of the total equitable share allocation for 2004/05.

Consideration should therefore be given to applying a revenue-raising capacity measure to the LES formula as a whole, rather than only to the I component.

### 9.3.1.2 Population

As noted above, the current formula takes account of population, with allocations increasing with population size until a given size is reached. There is a strong argument to take account of population, as the size of the municipal administration should bear some relation to the population of the jurisdiction.

It is therefore proposed that population should continue to be used in the formula, as it is intuitive that the number of people in a jurisdiction will influence the institutional infrastructure required.

The current I formula uses a scale parameter, however this was not based upon statistical study, and it would be necessary to establish more accurately the relationship between population size and the institutional infrastructure required.

## 9.3.2 Cost disabilities

There are a number of cost disabilities in the maintenance of a basic institutional infrastructure that could be considered in the formula.

However, the I component constitutes less than six percent of the LES formula, and the per capita I allocations to municipalities are quite modest. Including cost disabilities in the I formula should therefore only be considered if the disabilities account for large differences among municipalities in the cost of maintaining a core institutional infrastructure.

Two of the disability factors that could be explored through research are:

- Size of jurisdiction: the cost of governance and general administration is influenced by the size of the jurisdiction. For example, municipal councillors receive allowances for attending council meetings and

carrying out their constituency work, and these costs are far greater in municipalities covering large areas. At the same time, incentives need to be provided to municipalities to minimise administrative expenses.

- Location: If a municipality is located far from significant urban centres, then this will influence the cost of travelling to these centres for meetings and attending to local government business. It will also influence the costs of other aspects of office administration, such as the servicing of office machinery (where service providers must travel from significant urban centres). In developing this disability factor, it will be important to assess the extent to which this factor is related to the size of the jurisdiction.

## 9.4 Capacity-building grants

Once research has been carried out to establish the minimum institutional infrastructure required by municipalities (see suggested approach in section 9.2 above), it should be relatively easy to identify municipalities without the necessary capacity. The Municipal Demarcation Board carries out detailed capacity assessments of municipalities each year, which could form the basis for this identification.

Capacity-building does not necessarily involve grants to municipalities to develop capacity. Capacity can be developed through a number of methods, including learning networks, courses for municipal officials, or mentoring programmes, whereby experienced officials provide support to officials who lack experience.

Many of the initiatives will take the form of national or provincial programmes, rather than financial allocations to specific municipalities. To illustrate this, one can consider the capacity-building grants currently available to municipalities:

- the Restructuring Grant (R343m for 2004/05), which is available to metro municipalities to enhance revenue management and long-term sustainability;
- the Financial Management Grant, intended to support reforms in pilot municipalities (R198m for 2004/05);
- the Municipal Systems Improvement Grant (R182m in 2004/05), which is intended to fund the improvement of strategic management and service delivery skills; and
- technical assistance offered through the International Bank for Reconstruction and Development.

In addition, various national departments offer capacity-building through their programmes (for example, the Department of Water Affairs and Forestry).

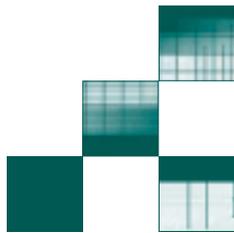
The above makes it clear that much of the funding for capacity-building will not be in the form of cash grants to municipalities, but rather through programmes administered by national or provincial departments.

It would therefore appear to be inappropriate at this time to develop a formula for the disbursement of capacity-building funds directly to municipalities. Rather, the capacity assessments of the Municipal Demarcation Board could be used as the basis for tailoring capacity-building programmes and funding.

## 9.5 Proposals: Funding of Institutional Costs

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- Consideration should be given to applying a revenue-raising capacity measure to the LES formula as a whole, rather than only to the I component.
- It is currently inappropriate to develop a formula for the disbursement of capacity-building funds directly to municipalities, as most capacity-building initiatives are not supported by direct grants to municipalities. However, it is advisable to develop appropriate administrative and/or institutional instruments that ensure that capacity needs are identified and adequately targeted.



## SECTION 10

# Measurement of Municipal Revenue-Raising Capacity

### 10.1 Background

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Section 214 of the Constitution states that the local government equitable share must ensure that municipalities are able to provide basic services and fulfil their functions, and it must take account of fiscal capacity and efficiency [Sections 214(2)(d), (e), & (f)].

The fiscal health of municipalities in South Africa varies tremendously. Some municipalities are in strong fiscal health, while others have large expenditure needs and very limited capacity for raising revenues.

There are two reasons why the reduction of fiscal disparities among municipalities is an important goal. First, the fact that the residents of some communities can enjoy more or higher quality public services than the residents of other communities even when they face similar local government tax burdens is generally considered to be inequitable. Second, the existence of fiscal disparities can lead to locational inefficiencies if decisions by individuals and businesses about where to live or operate a business are influenced by local government fiscal conditions.

### 10.1.1 FFC research

The FFC has expressed concern that revenue-raising capacity is not sufficiently captured in the current formula. In its Submission for the Division of Revenue 2002/03, the FFC recommended that:

- One overall revenue-raising capacity measure should be included in the local government equitable share formula; and
- Ideally, this measure should relate to specific local government revenue sources.

The Commission recommended that macroeconomic measures such as Gross Domestic Product by Region should not be used, as they do not relate directly to municipal revenue sources. The Commission proposed that conceptual research be conducted that would identify the main revenue sources of municipalities, describe the policy issues around each revenue source, and identify data for each revenue source.

This section presents a summary of this conceptual work. It provides an overview of the major revenue sources and presents proposals for the collection of the relevant data.

## 10.2 Overview of local government revenue sources

According to the 2003 Intergovernmental Fiscal Review, the largest share of local government operating revenue is derived from user charges, mainly from electricity and water, totalling R28 billion or 45 percent of operating revenue. Property rates make up R12.5 billion or 20 percent, and Regional Service Council (RSC) levies on businesses make up a further R4.4 billion or 7 percent. The remaining R16.7 billion is budgeted to come from refuse removal, grants, subsidies, tariffs, fines, and other user charges (see Table 2).

**Table 2: Consolidated municipal operating income budgets**

(R billion)	2002/03	%
Property Tax	12.5	20.3
Bulk Services	28.0	45.4
RSC levies	4.4	7.1
Intergovernmental grants	6.7	10.9
Other	10.0	16.2
<b>Total</b>	<b>61.6</b>	

Source: National Treasury, *Intergovernmental Fiscal Review 2003*

## 10.2.1 Theoretical Issues

Under the Representative Tax System approach, revenue potential is measured in respect of each of the revenue sources assigned to local government. The potential is estimated by multiplying the estimated tax base with the representative rate, and usually the average effective rate for the local governments is taken as the representative rate.

In the case of South Africa, municipalities may be classified into broadly homogeneous groups, and the potential may be estimated by applying the average effective rate for each group separately. This classification could be based upon population size, total municipal revenue, municipal own revenue, or some combination of these indicators.

The average effective rate for each revenue source for each group is estimated by dividing the total revenue collection from the source in all municipalities in the group by the estimated total base of the revenue source in the group. The potential from individual sources is aggregated to arrive at the aggregate potential. Thus, application of the approach to measuring revenue potential requires detailed data on revenue bases of and revenue collections from each of the revenue bases from individual municipalities.

### 10.2.1.1 Data Requirements

Historical data required for measuring fiscal capacity should satisfy the following requirements:

- The data should be disaggregated to municipal level;
- The tax base should have a uniform definition across municipalities;
- Fiscal years should be standardised; and
- There should be common accounting principles, and an independent auditing process should ensure that these principles are followed.

Currently, data on municipalities is collected by various departments and agencies. The municipal fiscal year is standardised (July to June). However, information supplied by municipalities is not reported in standardised format and most municipalities do not yet subscribe to Generally Accepted Municipal Accounting Practice (GAMAP).

The Municipal Finance Management Act (2003) prescribes the application of GAMAP and standardised budget reporting formats. However, it will take a number of years to fully implement these budget reforms.

## 10.3 Regional Services Council Levies

### 10.3.1 Background

Regional Services Councils (RSCs) were introduced in 1985 in terms of the Regional Services Councils Act 109 of 1985 (RSCs in the former Natal and KwaZulu were called Joint Services Boards).

Regional Service Council (RSC) levies, which are business taxes paid to the district and metropolitan municipalities, consist of two elements:

1. A Services Levy, which is a levy on payroll, and
2. An Establishment Levy, which is a levy on turnover.

District and metropolitan municipalities are required to prioritise infrastructure investment and to channel such investment where the need is greatest. Over time, however, levies have become increasingly used to cover operating expenditure, including the payment of capital charges. This is especially the case in metropolitan areas, which currently collect two thirds of the total levy income.

While relatively small as a proportion of total national taxes, the RSC levies are of great importance to local government from a revenue perspective. The six metropolitan areas account for over 68 percent of all regional service levies budgeted for 2002/03. Regional services levy income amounted to R4.4 billion in 2002/03.

### 10.3.2 Reform process

There are a number of serious problems with regional levies, such as economic distortions and the lack of enforcement powers. Consequently, the reform of RSC levies is currently being considered by Government, and seven possible options have been put forward. The most likely options are as follows:

1. Leave the tax structure as it is, but turn the administration over to SARS.
2. Abolish the turnover element of the levy and expand the payroll levy, incorporating it into other payroll taxes such as the skills levy.
3. Abolish it altogether and replace it with a grant to municipalities funded by a set percentage of VAT.
4. Some combination of the above, such as replacement with a mixed grant-payroll tax system.

In the 2002/03 submission on the Division of Revenue, the FFC proposed the following:

- That the revenue accruing to district municipalities through regional levies be retained within the local government sphere.
- That the revenue instrument chosen be subject to local control, allowing district municipalities to vary the rate and thereby be directly accountable to the electorate for the rate and the subsequent use of the revenue.

The FFC will therefore assess Government's proposals for the reform of regional levies against the Commission's previous recommendations.

### 10.3.3 Measuring the payroll and turnover bases

Discussions with SARS, StatsSA, and technical advisors indicate the following about the respective tax bases:

#### Turnover base

Conceptually the turnover base and the VAT base are different:

- The turnover base is not equal to the VAT base due to the zero-rating of certain foodstuffs, as well as the fact that certain export companies zero-rate their products. Thus, certain commodities escape the VAT base.
- Furthermore, turnover is levied at each stage in the production process, and there will be significant distortions between economic sectors and also between district municipalities.

There have been efforts to compare GDPGR to turnover. However, preliminary results indicate that it is not a good match. As a result, it does not appear to be feasible to measure the turnover base using either VAT or GDPGR.

#### Payroll base

- The income tax base is not an appropriate base to consider, as income includes many other sources, such as dividend income.
- There is a link between the payroll levy and the skills development levy (SDL). They are both levies on payroll, and the levies are both imposed on employers.

### 10.3.4 Conclusions: measuring the fiscal capacity of regional levies

As noted in the discussion above, it does not seem feasible to measure the fiscal capacity of turnover levies as there is no comparable base to measure (whether GDPGR or VAT).

Measuring the capacity of the payroll levy is more promising, as the SDL base and payroll base (as defined in legislation) are the same.

In order to take this forward, it would be necessary for SARS to disaggregate the SDL data to district / metro level and to ensure that the data reflects the actual location of workers (rather than their headquarters). This would require changes to the reporting format for the levy. It should be noted that SARS would have an incentive to generate this information if it were responsible for administering the payroll levy in future.

## 10.4 Property rates

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### 10.4.1 Background

Property rates are the most important source of general revenue for municipalities, especially in economically developed areas. Revenue from property rates is used to fund services that benefit the community as a whole, as opposed to individual households. Property rates revenue is also used to fund municipal administration, such as computer equipment and stationery, and costs of governance, such as community and council meetings.

Metropolitan municipalities raise over 71 percent of the R12.5 billion in property taxes. Local (category B) municipalities raise the remainder, as district (category C) municipalities do not currently impose property taxes.

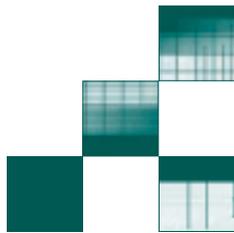
The December 2000 local government elections witnessed the birth of a new system of local government that created wall-to-wall municipalities. Areas that were outside the jurisdiction of local municipalities now fall within them, hence property owners in these areas will now be liable for property rates.

A new Property Rates Act has recently been passed by Parliament. The Act replaces the patchwork of laws and practices with a uniform national framework, while preserving local discretion over setting the tax rate, exemptions, and rebates. The Act requires that the tax base is the market value of land plus improvements, and these have to be taxed together at the same rate. The tax rate (which is decided by the municipal council) is the cent amount in the Rand applied to the value of property located in the municipality.

In December 2000, transitional municipalities were consolidated into larger units. This requires that the valuation and rating practices of the various municipalities be harmonised, and that a single valuation roll be prepared for each municipality. The Act requires municipalities to draw up valuation rolls in compliance with the Act within four years of the first financial year in which the Act applies (namely from 1 July 2004). This means that data from the new valuation rolls will only be available by 2008 at the earliest.

### 10.4.2 Implications of the new Property Rates Act for measuring fiscal capacity

With the requirement that all municipalities draw up a valuation roll, it becomes possible to measure the fiscal capacity of the property rates base. However, if municipalities are aware that their valuation rolls provide the basis for measuring their fiscal capacity, they will have an incentive to under-value properties (they could then compensate for this by imposing a higher rate).



The possible under-valuation of properties by municipalities can be solved by conducting an equalisation study. *Equalisation* describes the process that a supervisory or review agency might use to make blanket adjustments through the use of factors to the total appraised values (or assessments) of entire assessment districts. In so-called *direct* equalisation, the factors are applied to individual assessments before local taxes are levied. In *indirect* equalisation, the factors are used to adjust roll totals. An indirect equalisation process would therefore be applied in the South African context to compensate for municipal valuation rolls that reflect under- or over-valuation.

### 10.4.3 Conclusions

The Property Rates Act will provide uniformity to the municipal rating of property and will thereby facilitate the measurement of the fiscal capacity of property rates. Given the time frames suggested in the Property Rates Act, the soonest that information from municipal valuation rolls could be obtained would be 2008.

Although municipalities will have an incentive to under-value properties if it is the basis for measuring their revenue-raising capacity, this could be addressed through an indirect equalisation study that would establish the extent of under- or over-valuation.

## 10.5 Electricity surpluses

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### 10.5.1 Background

In 1999, there were 6.6 million electricity customers in South Africa. Municipal distributors and private interests serviced 49 percent of this group and sold 41 percent of the total electricity consumed. Eskom serviced 50 percent of these customers and sold 59 percent of the electricity they consumed.

The current electricity distribution industry is fragmented, with one very large distributor (Eskom), several medium-sized players, and many very small players. This diffuses skills, reduces efficiencies and puts small municipal distributors under significant pressure. Coupled with this are wide variations in tariffs within and across municipalities.

A restructuring process is in the implementation phase. Six Regional Electricity Distributors (REDs) will be created, and they will merge the distribution operations of Eskom and municipal distributors. The establishment of the REDs should be completed by mid-2006.

## 10.5.2 Implications of reforms for local government finances

Municipalities currently earn significant amounts of surplus income from their electricity function, which they use to fund general municipal expenditure. This surplus is earned through municipal distributors charging significantly more for their electricity than it costs them to deliver it. It is in effect a local tax on electricity. Government recognises the importance of this and has stated that lost income will be replaced.

There are two main options for an alternative:

1. A local government tax on electricity sales within its jurisdiction; or
2. A specific grant from national government.

National government is investigating whether a municipal tax on electricity should be introduced, and the extent to which additional national grants may have to compensate municipalities for the loss of electricity surpluses. The FFC has supported the introduction of a municipal tax on electricity, as an additional local government tax instrument will promote accountability of councils to their electorate.

## 10.5.3 Implications of reforms for measuring fiscal capacity

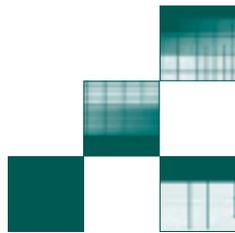
According to the restructuring proposals, two possible income streams have been identified, namely dividends from REDS and a municipal levy on electricity. These pose contrasting implications for measuring fiscal capacity.

Dividend income is unpredictable, as it depends upon profitability and shareholder decisions on dividend declarations. It would therefore not be suitable to measure the fiscal capacity of dividend income.

If there is a permanent municipal tax on electricity sales for municipalities and the rate can be varied, the fiscal capacity of the tax could be measured as the tax income will be fairly predictable.

To measure the fiscal capacity of this revenue source, electricity consumption would have to be measured. Data on electricity consumption would have to be broken down by type (e.g. residential, commercial, and industrial consumption).

Unfortunately, the collection of electricity consumption data in South Africa is complicated by the recent demarcation of municipalities. Owing to the creation of wall-to-wall local municipalities in December 2000, areas previously serviced by Eskom now fall within the new local municipal boundaries. Consumption information from two sources, namely Eskom and the National Electricity Regulator, has therefore not been integrated and much of the information may not be accurate.



The alternatives for obtaining data on electricity consumption are therefore:

1. In the long-term, to wait until the REDS are established and to require that they generate consumption data disaggregated according to local municipal area; or
2. Improve current data collection.

## 10.6 Tariff-funded services

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Water, sanitation, and refuse removal services pose certain problems in measuring fiscal capacity. These are highlighted below.

### 10.6.1 Water

Many municipalities in South Africa have traditionally generated surpluses from water provision, and these surpluses have generally been used to finance other municipal activities. While the surpluses generated were often significant, they were not as substantial as the surpluses generated by electricity distribution.

Increasingly, these surpluses are no longer available to municipalities as a revenue source. This is for the following reasons:

- Owing to the “free water policy”, surpluses are now being directed to subsidies.
- Not all residential consumers have water meters, and the costs of service provision cannot always be recovered. In the case of water supplies through communal standpipes, generally a component of the rates and services bill will be meant to cover water costs.
- Water tariffs are being brought into line with tariff guidelines set by government. This constrains the extent to which surpluses can be generated.

Water surpluses will therefore not be a source of revenue for municipalities in future.

### 10.6.2 Sanitation

Even where sanitation service costs are recovered directly from consumers (as opposed to being funded through property rates), historically this service does not generate surpluses. It is therefore also not a viable revenue source.

### 10.6.3 Refuse Removal

As with sanitation, refuse removal does not generate significant surpluses and therefore does not make a noteworthy impact on the municipal revenue generated.

### 10.6.4 Measuring Fiscal Capacity of Tariff Funded Services

As the discussion above has illustrated, water, sanitation, and refuse removal are geared toward cost recovery rather than generation of surpluses. While tariff-funded services have contributed to gross municipal revenue in the past – especially in the case of electricity and water – this contribution will progressively decline in the coming years.

However, it is important for the revenue-raising capacity measure in the local government equitable share formula to take account of the extent to which municipalities are able to recover the costs of service delivery from consumers. Owing to the tremendous income disparities in South Africa, the ability to pay tariffs for public services varies significantly across municipalities.

The FFC recommended in its Submission for the Division of Revenue for 2002/03 that national government should fund part of the cost of providing lifeline tariffs, either through the equitable share formula or through a national conditional grant to municipalities. Consumer cross-subsidies should further contribute to the subsidisation of the poor.

There are those who fall below the poverty line, and those who are just above the poverty line and struggle to pay tariffs. An accepted principle of public finance is that redistribution and poverty alleviation should be addressed by the centre, as fiscal capacity differs across subnational jurisdictions.

Government documentation does not explicitly mention how the global allocations for the S component and free basic services / free basic electricity funding windows were determined. It is important that the funds required to subsidise the poor should be carefully assessed in order to ensure that poor residents in all municipal jurisdictions have access to a minimum level of basic services. Consumer cross-subsidies could then assist in providing tariff relief to low-income consumers who do not fall below the official poverty line.

If households falling below the poverty line were subsidised primarily from the centre, then the ability of municipalities to cross-subsidise other low-income consumers would have to be assessed. This would require the use of the disaggregated household income or expenditure data.

## 10.7 Conclusions and proposals: Measurement of Municipal Revenue-Raising Capacity

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It is notable that each of the revenue sources under consideration in this paper is under review, and that the review processes will influence the measurement of fiscal capacity.

In the case of regional levies, a number of reform scenarios were outlined, and the measurement of fiscal capacity of each of the options was discussed.

After the implementation of the Property Rates Act (earliest July 2004), municipalities will be required to draw up valuation rolls, which will provide an estimate of the value of both land and improvements. Data from municipal valuation rolls will therefore only be available from 2008 at the earliest.

If municipalities are enabled to impose a tax on electricity, then the fiscal capacity of this revenue source could be measured. The base to be measured would be actual consumption, and this data should be provided by the new Regional Electricity Distributors. The data would have to be disaggregated to local municipal area. The extent to which a municipality can collect tariff income from low-income consumers and can cross-subsidise through high-income consumers should be taken into account in the revenue-raising component of the equitable share formula.

### Proposals:

- Municipal revenue-raising capacity should be assessed by measuring municipal revenue bases (or their proxy bases) directly. These bases are as follows:
  - Payroll levy: skills development levy base;
  - Property rates: municipal property rates base;
  - Electricity: electricity consumption; and
  - Tariff-funded services: income or expenditure (disaggregated into various income / expenditure groups).
- Government should ensure that the following municipal-level data is collected:
  - Regional levies: skills development levy data disaggregated to district municipal level (if the payroll levy is retained);
  - Property rates: municipal valuation roll data and specific rates data (that is, rates charged for each category of property); and
  - Electricity: consumption data (disaggregated into consumer categories).
- The funds required to subsidise the tariff charges of low-income households should be carefully assessed in order to ensure that poor residents in all municipal jurisdictions have access to a minimum level of basic service provision.

## SECTION 11

# Investigation into the linking of the local government equitable share and infrastructure formulae

### 11.1 Background

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The equitable share allocation is intended to ensure that municipalities can deliver basic services and fulfil their constitutionally-assigned obligations. Owing to the fact that many (primarily rural) municipalities lacked the institutional capacity to spend funds, the equitable share formula was phased in over a number of years.

Although this phasing will come to an end in the 2005/06 fiscal year, many municipalities have been unable to significantly increase the number of households with access to basic household infrastructure. As the equitable share is meant to cover operational expenditure for providing services to households, municipalities with many unserved households receive proportionately more from the equitable share than municipalities with a high proportion of serviced households.

As the equitable share allocation is unconditional, municipalities with significant numbers of unserved households could use equitable share funds for capital expenditure. Data on this is not available, however anecdotal evidence suggests that in some cases the equitable share has been spent on infrastructure, and in other cases municipal officials have resisted using equitable share funds for capital infrastructure.

The issue will become more significant with the introduction of the new Municipal Infrastructure Grant (MIG). The MIG will replace the current Consolidated Municipal Infrastructure Programme (CMIP), currently administered by the Department of Provincial and Local Government (DPLG). Unlike CMIP, MIG funding will be disbursed to municipalities through formula-based allocations that take account of infrastructure backlogs (until recently, municipalities have applied for CMIP allocations). The MIG programme aims to eliminate municipal infrastructure backlogs over a ten-year period. It has been piloted from 2003/04, and it is anticipated that the full programme will be phased in over three years.

The majority of the proposed MIG allocation to municipalities, namely 75 percent, is for household infrastructure, and it is calculated according to the number of low-income households without access to basic service levels for water, sanitation, electricity, roads, and other services. This means that some municipalities will receive allocations according to their backlogs, however at the same time the equitable share formula will allocate them funds for the maintenance of (basic services) infrastructure that has not yet been installed.

Government currently has no plans to link the local government equitable share formula with the proposed MIG formula. However, the issue has been implicitly acknowledged in the equitable share funding windows for Free Basic Electricity and Free Basic Services, which are distributed through formulae that take account of access to services.

This section outlines the issues relating to the possible development of a structured link between the two formulae.

## 11.2 Key issues

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### 11.2.1 Incentive effects

One of the reasons to link the two formulae would be to ensure that municipalities are provided with appropriate incentives to extend municipal infrastructure. Take, for example, hypothetical Municipality A, in which 80 percent of households do not have access to a minimum level of service infrastructure (e.g. water and sanitation). The equitable share allocation that Municipality A receives assumes 100 percent access to services, rather than 20 percent. Municipality A is aware that as it extends infrastructure, its operational expenses will rise significantly. These expenses are related to essential maintenance that is needed for continued service delivery. As these expenses rise, municipalities have less discretionary funding available, and this may provide them with an incentive not to extend services too ambitiously.

On the other hand, there will be considerable political pressure on councillors to extend municipal infrastructure. The financial incentive to limit spending on operations and maintenance will therefore be

counteracted by political pressure to extend services. Owing to these two factors, it may well be that incentive effects do not play a significant role in the extension of infrastructure.

Another incentive relates to value for money. If Municipality A receives an equitable share allocation based on 100 percent service provision but is only required to service 20 percent of its population, Municipality A may have funds well in excess of its operational maintenance needs. This is not conducive to efficient spending, as expenditure is not driven in the first instance by identified needs.

### 11.2.2 Partial provision of services

While it can be expected that the operational expenditure of municipalities with a large proportion of unserved households will be relatively low, it should be noted that many municipalities seek to provide basic services where there is no infrastructure. This service provision is often very costly, as when fresh water supplies are regularly transported to communities that have no access to potable water.

### 11.2.3 Equity considerations

There are compelling reasons to link the formulae for equity reasons. The purpose of the equitable share formula is to ensure an equitable distribution of the local equitable share amongst municipalities, and it would be important to ensure that municipalities receive allocations in line with their expenditure need. If Municipality A and Municipality B have similar profiles in terms of poverty, economic profile, and therefore their ability to raise own revenue, but Municipality A has a serviced population of 20 percent and Municipality B a serviced population of 80 percent, then intergovernmental transfers should address the considerably greater expenditure need of Municipality B.

### 11.2.4 Data

The new MIG programme will depend heavily on data. In order to calculate the (formula) amount for each municipality, data on access to water and sanitation services will be needed, as will data on public infrastructure and length and condition of municipal roads. A number of data issues arise:

- Although data on access to water, sanitation, and electricity infrastructure has been collected through Census 2001, this information is already three years out of date. In addition, to ensure that the allocations reflect reality, it would be necessary to have updated data on an annual basis. Municipalities will be required to report their performance, however these reports would need to be verified.

- Although the MIG framework states the data that will be used, this data does not always relate directly to the backlog being addressed. For example, the data used to assess the municipal roads backlog is the number of households living in informal settlements.

There are a number of approaches that one could take to the data issues.

- The linking of the formulae could take account only of those backlogs for which reliable data exist. So, for example, one could take account of access to water, sanitation, and electricity but exclude roads and public service infrastructure.
- The difficulties around updating backlog information every year could be addressed by assigning phase-in parameters. For example, if the backlogs are to be eradicated in ten years, then one would assume that 10 percent of a municipality's original backlog is eliminated each year.

## 11.3 Options for linking the two formulae

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A number of issues have been outlined above, and it would appear that three main options exist with respect to the linking of the two formulae.

### 11.3.1 Option 1: Retain the status quo

The first option is to retain the current situation, in which the formulae are not linked in any way. It could also be argued that the equitable share is unconditional, and that there is nothing to prevent municipalities from using equitable share funding to address infrastructure backlogs.

If the status quo were to be retained, the equitable share formula would remain stable until such time as a full review and reform of the formula was implemented. In addition, the current formulae would not be complicated by a "linking" process.

On the other hand, the equity concerns outlined above would not be addressed, and efficiency of spending could be compromised if municipalities have funds well in excess of their operational maintenance needs.

### 11.3.2 Option 2: Scale the equitable share allocation of municipalities according to access to services

In this model, the equitable share allocation to municipalities would take account of the proportion of residents with access to services. Amongst municipalities in similar circumstances, there would be a measure of equity.

However, the data issues could be quite challenging. Information on backlogs is available only for some services, and this information may need to be revised each year to reflect the installation of new infrastructure. In addition, this policy would probably result in significantly reduced allocations for primarily rural and poor municipalities. This option would also discriminate against those municipalities that are providing services where there is no existing infrastructure, as when fresh water is transported to communities with no access to potable water (see section 11.2.2 above).

### 11.3.3 Option 3: Leave the combined equitable share / MIG allocation unchanged, but vary their proportions

In this scenario, the combined allocation of equitable share and MIG allocation would not be changed, but the proportion of each would be affected. For example, if Municipality A has an “unserved” population of 80 percent and receives R10 million through the equitable share and a R10 million MIG allocation, then it would receive R20 million in total but this would be disbursed as (say) R4 million through the equitable share and R16 million through MIG.

If this scenario were chosen, it would be important to recognise that the local government equitable share formula is made up of the S (Services) and I (Institutional) components. As the MIG applies to the delivery of services, rather than operational overheads, the varying of the conditionality should not apply to the I component.

The data issues would not be so significant in Option 3, as they would influence the extent of conditionality of local government funding rather than the quantum. This option would also ensure that municipalities with low operating expenditure (relative to other municipalities) spend a significant portion of their transfers on the extension of services.

On the other hand, many municipalities will be unable to spend their large conditional grant allocation, as they generally do not have the capacity to spend and conditional grants require additional capacity owing to reporting requirements. One might wish to defer the spending of such a municipality’s MIG allocations, that is, they are “banked” until such time as the funding can be utilised appropriately. This would have two advantages: it would save on Government financing costs, and it would facilitate adherence to grant conditions, as a condition of the grant could be detailed reporting against specified indicators.

Option 3 is in line with the FFC’s Submission for the Division of Revenue 2003/04, which recommended that Government should develop a “differentiated approach” to municipalities to take account of their circumstances (such as lack of capacity). With respect to revenue sources, this could take the form of varying the conditionalities attached to intergovernmental transfers for different types of municipalities.

### 11.3.4 Option 4: Develop another mechanism to take account of service backlogs

The local government transfer system is currently in transition: the LES formula is in the process of review, a fiscal framework is being developed to address the issue of revenue assignment, and the MIG programme is in the pilot phase. The over-arching framework for local government finance may generate opportunities to address the issues highlighted in this section in other ways. For example, it may be possible to develop a capacity-building grant targeted at municipalities that lack the expertise to design and implement infrastructure projects, and this could compensate for a reduction in LES funding.

## 11.4 Conclusions and proposals: Linking the LES and Infrastructure Formulae

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In the absence of finality on such issues and difficulties around data, it would be premature to recommend one of the options above. However, it would be important for those involved in the LES review process to take account of the issues highlighted in this section.

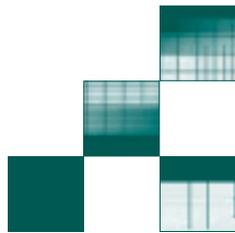
One theme that has recurred during the research process is that operational expenditure increases as more infrastructure is installed. Regardless of whether a formal link is developed between the two formulae, it is clear that a mechanism needs to be put in place to ensure that LES allocations for basic service provision keep pace with the installation of household infrastructure.

### Proposals:

- Consideration should be given to linking the MIG and equitable share formulae. In doing so, the following should be taken into account:
  - The need to provide municipalities with appropriate incentives to extend municipal infrastructure and spend funds efficiently and effectively;
  - The need to achieve equity in addressing the expenditure needs of local government;
  - The need to take account of the differing capacities of municipalities; and
  - The need to ensure that LES allocations keep pace with the installation of household infrastructure.

## SECTION 12

# Implications of Ceding Equitable Share Revenue as Security to obtain Municipal Loan Finance



### 12.1 Introduction

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Municipalities in South Africa are beginning to cede their future equitable share allocations as security in order to obtain loan finance. The FFC has expressed concern about this practice. The local government equitable share is meant to ensure that municipalities are able to provide basic services, perform their functions, and fulfil their developmental mandate. If a municipality cedes its future equitable share allocations, debt default by that municipality could divert its allocation to the creditor and could thereby compromise the delivery of constitutionally mandated basic services.

Accordingly, the FFC recommended in its Submission for the Division of Revenue 2002/03 that Government should give consideration to the extent to which different categories of local governments may pledge their equitable share revenue to access debt. In this regard, Government could consider an effective regulatory framework.

This section presents a contextual scan of the issues surrounding the ceding/pledging of equitable share allocations. It provides an international review, assesses the extent to which the equitable share is being pledged in South Africa, summarises a legal opinion on the legal framework, and then presents some conclusions and proposals.

## 12.2 Theoretical Overview

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There are various kinds of limited security that can be given to secure municipal debt. They include the following:

- Pledging of physical or monetary assets.
- Pledging the right to operate a facility or provide a service.
- Pledging of selected revenues, such as from tariffs, particular taxes, or intergovernmental transfers.
- Pledging the power to set specific tax rates, utility tariffs, and other levies.

Typically, in newly emerging economies, local governments are highly dependent on transfers from the central government. While these can be very volatile, they form a major portion of revenues and are attractive for interception to cover debt service payments.

Ensuring that subnational governments have access to their own sources of revenues that can be pledged as collateral is necessary to reduce possible moral hazard. Without such direct fiscal backing, markets might view any capital market borrowing by subnational governments as implicitly backed by the central government. Having their own fiscal base is therefore an important prerequisite for subnational governments' access to finance and for limiting moral hazard problems.

Academic literature and country experiences suggest that the fundamental cause of problems relating to municipal debt is that fiscal decentralisation is not accompanied by a rigorous regulatory framework that governs subnational debt. The absence of a regulatory framework, or presence of a poorly designed regulatory framework, will lead to unscrupulous borrowing by subnational governments and the resulting moral hazard problem.

## 12.3 The South African Context

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Even though borrowing from the private sector continues to be an attractive option for financing infrastructure in South Africa, it remains largely untapped. The municipal borrowing market has remained stagnant since 1994. At the end of December 2002, the total outstanding borrowing by municipalities amounted to R20.2 billion, marginally up by R300 million from the previous year.

The municipal borrowing market is also currently concentrated among a few lenders and the borrowers are generally larger urban municipalities. The main source of public sector credit to municipalities is sourced from the Development Bank of Southern Africa (DBSA) and amounts to R7 billion. Private sector credit amounts to R12 billion and accounts for 60 percent of municipal borrowing.

### 12.3.1 Legal Framework

Government is committed to the development of a strong municipal borrowing market, and has taken a number of steps to facilitate borrowing. The stagnant municipal borrowing market can be attributed mainly to the transition process and uncertainty in the legal framework, particularly in relation to recourse in the event of defaults, and the finalisation of municipal boundaries.

National government has implemented a number of processes to reduce this uncertainty, such as the enactment of constitutional amendments, the finalisation of the Municipal Finance Management Act (MFMA), the completion of the municipal demarcation process in 2000, and publication of municipal allocations for a three-year period.

As noted in the theoretical background above, the borrowing framework for municipalities should include the following elements:

- Municipal loans should not be explicitly or implicitly backed by national or provincial government; and
- The ceding of future revenue streams should be facilitated, but within a clearly defined regulatory framework that protects the provision of minimum services.

To a certain extent, these elements are contained within the current framework. The MFMA states that neither national nor provincial governments may guarantee the debt of a municipality or municipal entity. The regulatory framework for municipal debt encompassed in the Municipal Finance Management Act includes the following sections relevant to the ceding of equitable share allocations:

#### Section 48

- (1) A municipality may, by resolution of its council, provide security for –
  - (a) any of its debt obligations...
- (2) A municipality may in terms of subsection (1) provide any appropriate security, including by –
  - (e) ceding as security any category of revenue or rights to future revenue;
- (3) A council resolution authorising the provision of security in terms of subsection (2) (a)–
  - (a) must determine whether the asset or right with respect to which the security is provided, is necessary for providing the minimum level of basic municipal services; and
  - (b) if so, must indicate the manner in which the availability of the asset or right for the provision of that minimum level of basic municipal services will be protected.

- (4) If the resolution has determined that the asset or right is necessary for providing the minimum level of basic municipal services, neither the party to whom the municipal security is provided, nor any successor or assignee of such party, may, in the event of a default by the municipality, deal with the asset or right in a manner that would preclude or impede the continuation of that minimum level of basic municipal services.

The above sections of the Act indicate that it is possible to cede equitable share allocations as security for debt. Whether the conditions as spelled out in subsections (3) and (4) above apply to the ceding of equitable share revenue is a matter addressed by legal opinion (see below).

### 12.3.2 Legal opinion

The FFC obtained legal opinion on the Act in order to assess the extent to which it safeguards the delivery of constitutionally mandated basic services. The Breitenbach / Pillay opinion<sup>12</sup> came to the following conclusions:

- The wording of the amendment to section 230 of the Constitution encompasses the ceding of equitable share revenue (in other words, ceding equitable share revenue is constitutionally permissible);
- If municipalities cede future equitable share revenue, they are not bound to determine whether the security object in question is necessary for providing the minimum level of basic services (that is, the safeguards proposed in subsections 48(3) and (4) do not apply to the ceding of equitable share revenue).
- It would be preferable if the safeguards of clauses 48(3) and (4) were also applied to the ceding of equitable share revenue. However, it should be noted that the provisions of the Constitution and national legislation provide an overall safeguard, that is, a municipality may not exercise its power to cede equitable share revenue in a way that undermines its ability to meet socio-economic and developmental needs.

## 12.4 Extent to which equitable share is being pledged

All municipalities are required to submit details of their financial affairs, including borrowing arrangements, to National Treasury. However, this information does not give any indication of the extent to which the equitable share is being pledged. Lending institutions and municipalities were therefore contacted directly in order to elicit information on the subject. Their responses are outlined below.

12. Andrew Breitenbach;  
Karrisha Pillay.  
*Constitutionality of Aspects  
of Clause 48 of the Local  
Government: Municipal  
Finance Management Bill.*  
OPINION. Chambers, Cape  
Town. November 2003.

## DBSA

The DBSA has indicated that there is no knowledge within the bank of government grants or subsidies being utilised by their clients to securitise loans for the Bank's capital projects. However, the Bank is planning to develop guidelines to assist Bank personnel in securing equitable share revenue as collateral.

## Infrastructure Finance Corporation (INCA)

INCA accepts equitable share allocations as security only in exceptional circumstances and when there is existing exposure. Consequently, there are only two instances in which INCA obtained cessions of the equitable share from municipalities. In one case, the municipality was in default and their only option was to reschedule the debt. INCA felt that they could only accommodate the municipality if they could obtain the cession to improve the unacceptable credit risk. In the second instance, the municipality applied for additional loans, but the level of INCA's exposure was higher than what they would normally allow, given the municipality's reliance on a single industry.

## Municipalities

Financial managers and officials at a total of 17 municipalities were contacted by the FFC. None of the municipalities was currently pledging its equitable share revenue to obtain loan finance. At least four of the financial managers indicated that they did not know it was possible to pledge the equitable share revenue, and half of them believed it was not a good idea to allow municipalities to do so.

It should be noted that the FFC survey was random and not comprehensive, and only DBSA and INCA were surveyed, rather than the full range of financial institutions. It may well be that many more municipalities are pledging equitable share allocations.

## 12.5 Conclusions

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The ceding of equitable share revenue to obtain loan finance is permitted in terms of the Constitution. While the practice of pledging equitable share revenue is not common in South Africa, this may be primarily owing to the fact that three-year MTEF allocations to municipalities were only gazetted from 2002/03 onwards. It is therefore likely that municipalities will increasingly use future equitable share allocations to leverage loan finance.

It is important to return to a previous FFC recommendation on municipal borrowing, namely that Government should give consideration to the extent to which different categories of local governments may pledge their equitable share revenue to access debt.

It is necessary to adopt a differentiated approach to municipalities in South Africa owing to the tremendous variations among municipalities in terms of characteristics such as revenue base and human resource capacity. Municipalities in a healthy financial position are able to secure loan finance without resorting to the securitising of equitable share allocations, as they are able to demonstrate that the infrastructure being financed will generate a sufficient revenue stream to cover debt service costs.

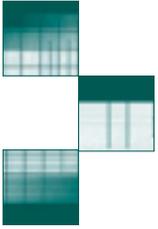
Indeed, it is municipalities that generate relatively little of their own revenue that are the most likely to make use of the equitable share allocations as loan security, as they may otherwise be unable to obtain loan finance. It is these municipalities who may place themselves in a precarious financial position in future if they enter into ill-considered loan agreements. The consequences will be felt most by residents who depend upon municipalities for the delivery of basic services.

There is, however, no regulatory framework in place to address these pledging issues. For example, a municipality could pledge its equitable share revenue to re-finance an existing loan, or to finance infrastructure that is not related to basic service delivery. Without such a framework, the current situation is a dangerous one.

## 12.6 Proposals: Ceding of Equitable Share Revenue

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- Government should consider two broad options for addressing the issues raised in this section:
  - The Municipal Finance Management Act could be amended to ensure that the safeguards proposed in section 48(3) and (4) apply also to the ceding of equitable share revenue.
  - In light of the overall safeguard provided by the Constitution and national legislation, Government could issue guidelines to municipalities with respect to the ceding of equitable share revenue. This could propose safeguards and recommend that the pledging of equitable share revenue only occur where the loan is intended to finance infrastructure for basic service delivery.



# Review of the Intergovernmental Fiscal Relations System

**[Part 3]**



## SECTION 13

# An Evaluation of Data Sources for the Intergovernmental Fiscal Relations System

### 13.1 Background: Financing of Constitutional Obligations

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The FFC seeks to ensure that Government meets its constitutionally mandated obligations to provide basic services, especially those listed in the Bill of Rights. These services are hereafter referred to as constitutionally mandated basic services, or CMBS.

In order to address the shortfall in access to essential services, the equitable share allocation redistributes revenue towards each region according to, amongst other factors, the number of poor. However the equitable share allocation improves people's access to services and not (except in so far as social security grants are concerned) their income. The equitable share allocation has thus improved the poor's access to services more rapidly than it has improved their income. As long as the equitable share relies on personal and household income as a measure of poverty, it will not fully reflect the improvement in access to services arising from past allocations. Over time the reliance on this measure of poverty will result in increasingly

skewed allocations as the shortfall in services is progressively addressed. If this situation prevails, the mismatch between needs and resource allocation will be aggravated rather than ameliorated.

Indications at this stage are that the mismatch is substantial. For example, in 2002 approximately 40 percent of households reported incomes of under R1,100 per month. Many of these households report earning substantially below this level. For general purposes this group can be safely classified as “poor”. However over the past ten years much of the focus of state initiatives has been on improving the access the poor enjoy to basic services. The extent of state efforts can be broadly measured if these services were to be valued in monetary terms. For instance, if these “payments” to the poor in the form of free basic education, primary health care, housing, water, and other essential services are totalled, they approximate to almost exactly as much as the (upper) poverty level indicated above (R1,092).

In other words, the vast majority of poor households are receiving payments in the form of services well in excess of their income. Unfortunately these services are unevenly distributed among the poor and many households receive services worth substantially less than this amount. It is this group that is of primary concern to Government as they do not have the benefit of CMBS.

This section of the Submission reviews the data requirements, indicators, and principle dynamics of meeting the objective of CMBS provision. The review addresses the mismatch between needs and resource allocation that results from poorly defined and utilised socio-economic indicators and data.

## 13.2 Evaluation of Various Data Sources

### 13.2.1 Local Government Surveys

Currently the level of demand for CMBS is derived from the nationally pooled surveys, which are more responsive to the needs of national and provincial government than those of local government. Unfortunately, large as these surveys may be (approximately 30 000 interviews each), they do not adequately represent every municipality.

The only nation-wide data that does this is the Census. There is a lack of depth in Census questions. For instance, they are able to speak to the ability of households to access services but are silent as to the extent to which poor households access CMBS by paying for them. By not adequately representing this dimension, resource allocations may prejudice those households that access CMBS only at the expense of other essentials.

The Commission’s Submission for the MTEF 2004–2007 highlights the data challenges facing Government. In particular, it points to the desirability of a bottom-up approach in which data is aggregated from the

local level of public service delivery and revenue collection to provincial and national level. This approach places emphasis on the primary interface between the users and suppliers of CMBS.

By disaggregating service delivery to the maximum possible extent, the effects of grouping disparate communities and individuals together is minimised. By looking at individual municipalities, for example, the position of the “average” household or individual is much more informative than looking at the average of agglomerations of larger and even more disparate individuals and households.

With the maturation of South Africa’s institutions of governance, the pivotal role of disaggregated local government level data is becoming ever more important. Apart from the role of municipalities in delivering a number of constitutionally mandated basic services, municipalities are being increasingly required to implement national and provincial policies. Municipalities are beset by resource constraints that are directly linked to high levels of poverty, and dependence on state-provided CMBS is most acute where poverty levels are the highest.

Pooling surveys at a disaggregated level would enhance the measurement of demand for CMBS at the lowest spatial level possible and would also lead to an improvement in the efficient distribution of financial resources for the provision of CMBS.

### **Municipal Data Problems**

Unfortunately the local sphere of government is also the one for which data is least reliable. Even the massive Labour Force Surveys (LFS) do not adequately represent each of the 284 municipalities. In effect this constrains the availability of reliable demographic data for municipalities to census years and to those questions adequately addressed in the census.

Even the collation of municipal accounts on a comparable basis is not yet being systematically pursued. As recently as 2003 the introduction of Generally Accepted Municipal Accounting Practice (GAMAP) was, at best, uneven. Moreover the information that was available was not being systematically archived by any central authority. The Auditor-Generals of each province are not yet able to provide these public accounts to users. Given the wealth of information available in the completed accounts, ensuring that the required data is centrally available should be made a priority.

Even if the municipal accounts were available, they would have to be subjected to critical analysis before their utility could be fully assessed. For example, current practice is for municipalities who do make free basic allocations of water or energy to indicate that all households in the area receive the allocation. This is largely an illusion, as wealthier residents consume well above the free basic allocation and, through progressive tariffs, subsidise poorer consumers (or those who otherwise fail to pay). Thus while they do nominally receive a free basic allocation, progressive tariffs ensure the wealthy are effectively subsidising others’ free basic allocation.

The accounting practices being adopted need to cast light on these dynamics, as the information required for intergovernmental transfers should preferably indicate how many households are dependent on the free basic allocation (and who receive it free). As municipalities adopt a larger burden of providing CMBS, for example through water and energy subsidies, the shortfall in data is increasingly problematic.

### 13.2.2 Data Sources

In terms of data requirements, the practices of several Anglophone countries with federal systems of government are useful to examine. Almost all of these countries (with the exception of India) are economically highly developed. However the Australian and Canadian experiences are more comprehensively documented and are thus drawn on extensively in this section.

### 13.2.3 Unit of analysis

In South Africa, the household is used as a unit of analysis. By contrast, more developed countries consistently emphasise individuals as the preferred unit of analysis. The divergent practice is justified partly on the basis that service delivery in South Africa tends to be heavily focused on households (water and energy allocations) and there is greater variety in household size in South Africa. Extended families are the norm in some areas, while single parent and single person households are the norm amongst others (like among migrants). The high dependency ratio in South Africa will compel the continued use of the household as a unit of analysis in South Africa.

This has necessitated a shift in perspective: instead of using individual incomes to determine poverty levels, the use of household income or (more appropriately) *per capita* household incomes is preferred. Obviously the demands on the data resources are consequently much greater. The main information requirements are critically examined below.

### 13.2.4 Population Data

There are two primary sources of population estimates, namely the five-yearly census and the bi-annual household surveys conducted by Statistics South Africa.

The latter surveys are variously called Labour Force Surveys (LFS), General Household Survey (GHS), or the (now redundant) October Household Survey (OHS). Their greater frequency and more detailed information ensure that these surveys are of greater intrinsic interest than the censi. However as sample surveys they suffer from two fundamental drawbacks.

- They are not reliable at sub-provincial level as sampling error becomes substantive even at municipal level.
- Their sampling frameworks are based on the latest available census and at best they offer imperfect measures of population change. All such sample surveys (which are not based on panel or longitudinal frameworks) draw on samples drawn in proportion to the population of randomly selected enumerator areas. The only source of enumerator area population used in drawing these samples is the census. The surveys are however able to reflect population changes in so far as they impact on household size and composition. Unfortunately the surveys capture the changing population densities of enumerator areas poorly.

Table 3: Summary of data sources for population estimates

Level of analysis	Census	StatsSA surveys
National	Estimates for 1996 and 2001	Bi-annual estimates based on previous census
Provincial	Estimates for 1996 and 2001	Bi-annual estimates based on previous census
Municipal	Estimates for 1996 and 2001	Population estimates unreliable for all municipalities with possible exception of metropolises

From the above, it appears that reliable estimates of sub-provincial populations are only available for census years. However this also applies, albeit to a lesser degree, to estimates at national and provincial level. The most reliable estimates of provincial and national population estimates are the mid-year estimates done by StatsSA. These estimates rest on a demographic model of population changes. These estimates are also not disaggregated by socio-economic group.

### 13.2.5 Poverty Data

After population counts and the associated age profiles, the more important data required is almost certainly the data relating to household and individual income. As noted above, socio-economic status as measured by income has perhaps taken an unduly prominent role in resource allocation. Income levels nevertheless remain essential in many regards.

At this stage there is no agreed official poverty datum line that can be used as an income level defining "poverty". Consequently municipalities, provinces, and national departments tend to use somewhat arbitrary income levels. The criteria adopted by organs of state do not always reflect a normative understanding of poverty. Partial housing subsidies, for example, are available to households that fall into the richest forty percent of the population.

When income levels are used to denote low economic status, they are set either by convention (units with income under a given level, such as households earning less than R1 100 per month) or by some “objective” measure of required income. The latter measures include the Primary Household Subsistence Levels (PHSL) calculated by the University of Port Elizabeth. The PHSLs are estimates of the income required to sustain households of varying sizes in the metropolitan and large urban areas. These estimates are based on households making informed decisions about how to efficiently meet their dietary and other requirements. Estimates are not available for residents of small towns or rural areas.

### Challenges with the Current Measures of Poverty

Each of the methods brings its own challenges. Defining the “poor” as the poorest 25 or 40 percent of the population ignores overall trends, which may place larger or smaller numbers of households under threat. Using an arbitrary cut-off point, of say, R1,200 per month, ignores the massive diversity of household size and conditions in which these households find themselves. A household comprising a single university student finds itself in the same “threat” category as a ten-person household composed of children and the elderly in a deep rural area. Part of the latter challenge can be overcome by using *per capita* household income, perhaps weighted by the age of each household member.

Both the census and survey data allow for these latter restrictions to be overcome with a bit of effort. For example, estimating per capita household income requires calculating the household size and matching the estimate for each household to the household income. The latter often resides in a different database or file.

Given the diversity of measures used in identifying target “markets” and beneficiaries, determining the income levels with the required degree of flexibility shifts additional demands onto the data sources. The data has to be sufficiently flexible to estimate a number of income levels while combining these with details of the household and the level of service it enjoys. As a rule, complex derivations can only be achieved using the sample of the census or the national surveys. However, with both these resources, the required flexibility is undermined by the use of broad income categories.

### 13.2.6 Sources of Error in the Census and National Surveys

Respondents are usually asked to indicate the income band into which they or their household falls. The use of such bands minimises outright refusals and misrepresentation by respondents. Unfortunately the price of the higher response rate is greater uncertainty, as it is never clear if the respondent’s income is at the upper, lower, or in the mid-range of the band indicated. Neither does the use of income bands eliminate misreporting by respondents. Both misreporting and the effect of using income categories can be seen in the extent to which the sum of individual household members’ income does not correspond to total

household income. As can be seen in the table below, household income was reported to be substantially lower than the sum of income earned by household members in both the LFS and Census 2001.

Table 4: Estimates of household income for the period 2000/01

SOURCE	ROUNDED VALUE	NOTES	MIN	MAX
Census	R203 billion	Household income	-	-
Census	R454 billion	Individual earnings	-	-
LFS 2001	R285 billion	Current household income	R276 billion	R294 billion
IES 2000				
Total income	R437 billion	Current total household income	R416 billion	R458 billion
IES 2000	R390 billion	Current regular household income	R370 billion	R409 billion
LFS 2001	R329 billion	Income of workers	R313 billion	R344 billion
National Accounts	R715 billion	Current income of households	-	-
National Accounts	R457 billion	Compensation of employees	-	-

The discrepancy in reported income is partly due to the summation of individuals' income when using the mid-point of the income categories. However the more detailed information in which respondents report each individual's earnings from a variety of sources is almost certainly more accurate than estimates derived from the respondent providing a single figure in which all these dimensions are captured.

The most systematically collected information regarding income and earnings are those from the five-year *Income and Expenditure Surveys* (IES) conducted by Statistics South Africa. In 2000 the last IES was conducted in parallel to the annual *October Household Survey*.

The value of the IES lies in the large sample size (approximately 30,000) and the highly detailed economic information collected. In terms of economic information, the IES is a vast improvement on the *Labour Force Surveys* (LFS) and *October Household Surveys* (OHS), which have similar sample sizes and are conducted more frequently. As they do not detail individual expenses and earnings, both the OHS and LFS rely heavily on recall as well as on accurate reporting of the earnings (and expenditure) of absent household members. A further weakness of the LFS and OHS is their use of broad reporting categories.

## Labour Force Survey

Within the LFS, although respondents are asked to report their exact earnings, they are also given the option to declare income in categories. Using this survey, approximately one-third of households have incomes of under R799 per month. This means that there is disaggregation of the poorest households into only two income groups.

Respondents of economically active age are also asked to declare their earnings. These earnings are similarly placed into categories. However, re-estimation of household income requires the aggregation of individual workers' earnings based on the mean value of the category they fall into. The emphasis on those of economically active age ensures that data is more systematically collected for such individuals than it is for those who are not in the age group. The surveys consequently undervalue the impact of grants and pensions. The aggregation of household income from individual earnings usually excludes earnings from grants, pensions, or other sources.

## Income and Expenditure Survey

The shortcomings of the LFS data, coupled to better training for IES fieldworkers, ensures that the less frequent IES is the preferred source of income and expenditure data. While it is generally of higher quality because respondents are required to give detailed accounts of exchanges, there are nevertheless substantial questions regarding the IES itself. Firstly it should be recalled that the IES is not reliable below provincial level. Secondly the IES may still be highly inaccurate, particularly when compared to national accounts.

In 2000 current household income was estimated by the South African Reserve Bank (SARB) to be R657,374 million. This represents an average household income of R4980 a month. By comparison the IES indicates an average household income of only R3300 for the same period. The discrepancy is substantial (50 percent of the IES value) and indicates that either the accuracy of the IES or the derivation of the SARB must be in dispute.

Even if the IES systematically underestimates income, it may still be of great value to the equitable share formula if the origins of the error are identified and if the effects of under-reporting are better understood. If, for example, all income groups similarly underestimate their income, the situation can be easily corrected by re-weighting. This is however unlikely to be the case.

## Census Data

As compared to other surveys, the Census is a great deal more complicated. The current Census information is available in two radically differing formats, each of which is discussed briefly below.

The most widely used format is the Super Cross/ Super Table/ Super Map format. This format draws on a proprietary software package to extract Census results while ensuring anonymity of respondents. This is achieved by randomising results relating to cells with fewer than five respondents. The software enables users to extract a wide range of cross-tabulated results at national, provincial, municipal, and ward level.

Two main restrictions are evident:

1. The combination of cross tabs, while extensive, must conform to a disaggregation anticipated by StatsSA. Not every combination of variables can be made currently. The providers of the data have nevertheless anticipated the most useful ones.
2. The output of the table is typically in spreadsheet format like Excel or ASCII tab delimited. The output includes region code names, descriptions, and other ancillary information that is inconvenient to read into other packages without additional editing.

The second format in which the census information will be made available is that of a random sub-sample of responses, or “10 percent Census Sample”. This is usually in the form of the full (and corrected) response recorded by every tenth (or so) household and the individuals linked to that household. As the data is made available in fixed ASCII format it is readily readable by other software, and, more importantly, all conceivable combinations of variables can be extracted.

As anonymity cannot be assured by randomising small cells, Stats SA achieves it by ensuring that relatively large regions are agglomerated. In 1996 the data could only be disaggregated to municipality level and not to enumerator area level. Seemingly the 10 percent sample of the 2001 census will enable users to identify the ward in which the respondent was located. This is a substantial improvement on the municipal level offered in 1996. As this is essentially a sample of Census responses, sample error has to be taken into consideration. However a 10 percent sample of the population is a healthy sample size and sample error is generally limited.

An additional note of concern regarding the census information relates to Stats SA not making available details regarding enumerator areas. As this information is critical for the drawing of LFS and other samples for surveys, failure to release the information could be an indication that the required information is not available or is of poor quality.

### 13.3 Data Requirements for the Allocation Formulae

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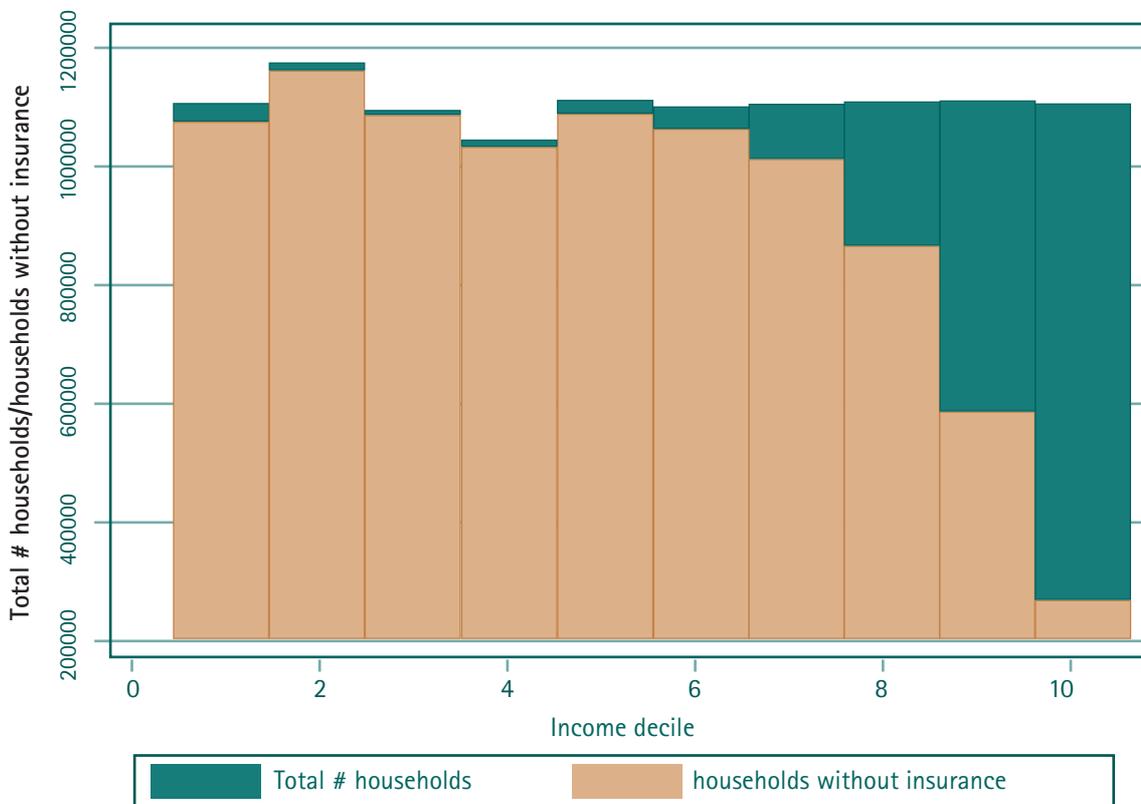
In its 2004–2007 MTEF submission, the FFC categorised its data requirements into three groups, namely data relating to financial indicators, delivery indicators, and policy outcome indicators

In order to unpack the main dimensions of spending on programmes that are devoted to the delivery of CMBS, the activities of each government sector concerned with poverty alleviation need to be looked at.

### 13.3.1 Health

Public health care facilities have become increasingly focused on the needs of those unable to afford private services. This has resulted in the emphasis on primary health care services, which are freely available to all, and in post-primary health care (namely secondary and tertiary care), which is freely available only to those without adequate means. The high cost of private health care suggests that the public health system is both the primary service for most citizens and a system of last resort to those who are no longer able to afford private rates. In essence, Government's system is central to the health needs of almost all residents without adequate medical insurance.

Figure 1: The Relationship Between Income And Medical Aid Uptake Rates



Source: *Labour Force Survey, 2002.*

The LFS of 2002 allows the relationship between income and medical aid uptake rates to be explored. This data indicates that medical aid uptake rates are only significant for households in the top three income deciles. In other words, 70 percent of the population is exclusively or partly dependent on state medical services. This segment of the population includes almost all households with incomes less than R2400 per month, a figure double that taken as a typical poverty line. This indicates that any equitable share relating to state health facilities should not be treated as if it were the exclusive domain of the poor. A more appropriate assumption would be that health facilities are relied on by all but the richest 30 percent of the population.

The Department of Health is involved with a number of projects that are related to the provision of CMBS. As a rule the data mostly refers to capital expenditure and grants and tends to exclude the operational costs associated with existing services. The data includes information on the following:

- 1 Clinic upgrading and building programme
- 2 Integrated Nutrition programme
- 3 Poverty relief  
*Provincial expenditure by financial year, indicates percent of allocation actually spent*
- 4 Conditional grants  
*Total allocation and expenditure by province*
- 5 Integrated nutritional programme  
*Allocation, transfers and expenditure by financial year*
- 6 Malaria control
- 7 TB control programme  
*Indicates reporting rate and number of cases reported by calendar year, data available for age/sex categories. No expenditure data.*

### 13.3.2 HIV/AIDS across Sectors

Any estimation of demand for health facilities has to take HIV/AIDS into consideration. The primary significance of the HIV infection rate is its impact on the access other users have to medical facilities. As the HIV/AIDS rate increases and as the disease matures, sufferers make ever-greater demands on the health system. In doing so they increasingly draw resources away from those requiring medical attention from diseases, trauma, and other conditions not related to HIV/AIDS. The HIV rate should be reflected in resource allocation (in this case through a conditional grant) because of its debilitating impact on the health system in general.

Estimating the incidence of HIV/AIDS is an important complement to the efficient allocation of resources. The incidence of the syndrome points to the extent of additional demand on health facilities, the prevalence of orphaning, and the extent to which households are headed by either the aged or infirm or by children themselves.

There are three primary estimates of HIV prevalence available. These are provided by the Actuarial Society of South Africa (ASSA), the Department of Health, and the Nelson Mandela Trust survey.

#### Department of Health

The Department of Health derives its estimates of HIV/AIDS from a survey of women attending selected pre-natal clinics across the country. The incidence of the condition is derived from blood tests taken from patients making use of pre-natal services for the first time at selected clinics. The results have two shortcomings:

1. They are based on a sample of clinics and thus subject to sample error.
2. They reflect a small group of the population. The results are silent as to the status of men, women who are not pregnant, and those who are pregnant but do not make use of state pre-natal clinics.

Unfortunately the results of the Department of Health's estimates are read as if they represent national trends, that is, as if the prevalence rate is the same for women who are both pregnant and wealthier and those who do not use state facilities. The Department's results are generally available only as simple prevalence estimates available for each province.

### Actuarial Society of South Africa (ASSA)

In order to overcome the flaws of the Department of Health survey, the Actuarial Society of South Africa (ASSA) has developed models that attempt to reconcile known prevalence rates with observed mortality rates and age profiles. The resulting output is an interactive model that allows the user to accept or change default settings depending on their preference regarding term to death, extent of condom use, and so forth. The model is freely available and easy to use as it is based on an Excel spreadsheet with macros. The flexibility of the model is also its downfall, as the output is highly dependent on the assumptions the user makes. These may be construed as subjective.

### Nelson Mandela Trust

In a further attempt to improve the estimates of HIV/AIDS incidence, the Nelson Mandela Trust commissioned a national survey on HIV/AIDS. This survey of 13,000 centred on respondents providing a saliva sample and details of their sexual history. The saliva was tested for signs of HIV/AIDS and the results were used to derive estimates of HIV/AIDS for the country as a whole. Although the results were somewhat surprising (Free State had the highest incidence of HIV/AIDS and not KwaZulu-Natal), as expected they showed that the Department of Health and ASSA had overestimated the prevalence of the condition. However, despite the healthy sample size, the survey suffers from a relatively high refusal rate. Refusal rates are generally not a problem when refusals can be treated as random, that is, the refusal is the product of factors other than the survey itself.

As HIV/AIDS affects the sexually active most and the impact may be felt several years after infection, HIV/AIDS serves to change the household age profile by decimating the population of economically active age. This ensures that the ancillary impact on economic activity and dependency ratios is of paramount significance.

### 13.3.3 Housing

In any new budgeting system, it poses a challenge if the goalposts are constantly shifting. While this may

not in itself be problematic, a particular challenge is presented when objectives move as a consequence of the policies being implemented. This appears to be the case in housing and related services. The value of housing subsidies is based on household income and not household size. As housing delivered via the subsidies is invariably of modest size, it is best suited to small households.

There is increasing evidence that poor households – in an attempt to optimise access to housing subsidies and related services – are rapidly reducing in size. By “unbundling,” poor households can dissolve into smaller units that are more easily accommodated in RDP-size houses and can live more comfortably on the 6kl free basic water allocation or the modest allocation of free electricity. Comparisons between 1996 and 2001 censuses indicate that the reduction in household size has added almost as much to demand for CMBS as has population growth. The existing policies thus seemingly contribute to the moving of the goalposts in a significant way.

One implication is that the method of allocation used by the Department of Housing should be based less on the number of households requiring adequate housing than on the number of housing units required to address the shortfall should the new households be of similar (reduced) size. This requires that an in-depth examination be undertaken of the size of households still to be adequately housed.

By far the most dominant activity of the Department is its housing subsidy scheme. The data available from the department in this regard is highly detailed. It includes (by municipality and point locations) the number of subsidies approved, value of subsidies approved, number of top structures completed, and number of sites prepared.

Unfortunately the data does not include a breakdown of subsidies awarded by the value, that is, how many were worth the full amount and how many were of reduced value as the household qualified only for a partial subsidy. This information is essential in determining the extent to which subsidies are awarded to households that are not poor.

Other CMBS efforts of the department of housing include the Special Integrated Presidential Projects and Human Settlement Redevelopment Programme.

### 13.3.4 Social Development

The core business of the Department of Social Development relates to pensions and other grants. The Department is able to provide, by pay point, details of payments made to beneficiaries. The information can be collated to calculate the number of beneficiaries and the total paid out. Data and information on social security are good, except that there is a need to ensure that estimates of population eligible for grants is properly means-tested.

Other CMBS-related activities of the Department include:

- 1 Welfare Services
- 2 Emergency food programme  
*Number of beneficiaries and cost by province and year*
- 3 Flagship programme  
*Province and point location, description of service and value*
- 4 HIV/AIDS  
*Amount paid and gazetted by province and year*
- 5 Home community-based care  
*Province, municipality and point location by year, name of service provider, amount budgeted*
- 6 National Integrated Plan  
*Amount allocated and paid out for health, education, and social development by province and year. Data disaggregated for conditional grants and for “youth and children”*
- 7 Poverty Relief  
*Project name, place location, and amount asked for and recommended*

### 13.3.5 Education

The substantive changes in the education system have resulted in many challenges in terms of evaluating performance. Differing standards are being adopted as Outcomes Based Education (OBE) is phased in. The introduction of OBE and related evaluation criteria make it difficult to compare performance across time. In this context, a suitable unit of performance measurement would be the pass rate coupled to a measure of the rate with which those entering the school system progress through grade 12. While such a measure is not intrinsically difficult to implement, it does call for the collation of time series statistics as scholars progress by age cohorts from grade to grade. Any measure of performance should thus be able to identify the holding back of scholars prior to giving them an opportunity to pass matric.

As a rule, the Census and national surveys enable the age of the respondent to be related to the highest education level achieved. This indicates that the national data coupled to the Department of Education statistics (which are reasonably detailed) could be productively used in influencing policy direction.

The Department is also able to provide highly detailed information regarding all aspects of the education system, including progression rates and gender and scholar/teacher ratios.

## 13.4 Policy Outcome Indicators

In order to measure the impact of departmental expenditure, the extent to which the resources are

translated into positive outcomes among the targeted populations must be measured. In other words, a distinction needs to be drawn between the simple roll-out of resources and the reduction in need among vulnerable populations. Obviously “the vulnerable” constitutes a moving target as standards of wealth and policy objectives change.

Despite these changes, there are simple ways in which impact can be measured. These essentially involve comparing the achieved impact to the required impact. The latter inevitably has to be measured by independent mechanisms like surveys. Typical measures would include the take-up rates for grants. One proposed measure is the percent of population below a given income level not receiving state grants. Other measures could, for example, include:

1. Number of households without access to clean running water (piped to within a policy stipulated objective – typically within 200m of the dwelling)
2. Overcrowding in housing
3. Nutritional poverty. This may be measured (as suggested by the FFC in its 2004-2007 MTEF submission) by the proportion of income spent on food. However difficulties in estimating intake (partly because of intra-household distribution) may indicate that a simpler measure (such as the existence of any food shortage within a predetermined period) may suffice.

To enhance the ability to compare, these measures should correspond as closely as possible to the objectives set by state agencies. Unfortunately very few national departments have clearly established norms and standards for public service delivery, especially for those public services that are concurrent. This complicates the data requirements, as central to measuring impact are the norms and standards that the policy strives to achieve. In the absence of consistent norms and standards, the burden of developing appropriate and reliable proxy measures will increasingly fall on surveys and other data sources.

## 13.5 Proposals: Data Requirements for the Intergovernmental Fiscal Relations System

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- Government should examine the practicality of pooling current household surveys at the municipal level so as to ensure that reliable estimates of household income at municipal level may be generated. This may be further aggregated to the provincial level.
- As municipalities conform to GAMAP, the warehousing and evaluation of municipal accounts information should be regulated and co-ordinated.
- Government and its data-gathering agencies should establish a definitional norm for household income poverty so that appropriate short-, medium-, and long-term policy targets may be set.
- Government, Constitutional bodies and institutions, and Statistics South Africa should work towards common definitions of populations targeted for the delivery of Constitutionally mandated services on the basis of age / gender, disability, poverty and vulnerability.

## SECTION 14

# Poverty Targeting

Over the past three years, the FFC has discussed in its submissions the need to align budgetary policy instruments with policy objectives and targets. In this section, the FFC examines how Government's policy objective of poverty eradication may be addressed through aligning policy targets for poverty eradication with the appropriate budgetary programming.

According to official statistics, approximately half of South Africa's population lives below the income poverty line and approximately 40 percent of the economically active population is not formally employed. The Constitution requires progressive realisation of universal access to the constitutionally mandated basic services that would constitute most of a comprehensive poverty alleviation package.

All three spheres of government share the responsibility for the provision of constitutionally mandated basic services. The financing of provincial and local provision of these basic services comes primarily from the Provincial and Local Equitable Shares, so the issue of poverty targeting is integral to the mandate of the FFC.

This section seeks to identify national, provincial, and local government budget programmes for provision of constitutionally mandated basic services that alleviate poverty, identify the costs and benefits of different

poverty targeting methods, and propose evaluative criteria, a medium-term research agenda, and data requirements for assessing the effectiveness of different poverty targeting regimes.

## 14.1 Context

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The list of basic services mandated in the Constitution's Bill of Rights constitutes most, though not necessarily all, elements of a comprehensive approach to address poverty. Income poverty is addressed directly through social security grants and social insurance. Capability poverty is tackled through the provision of free or subsidised education and health care services, food packages, and some free basic municipal services (notably water). Asset poverty is addressed through subsidised land and housing provision.

The extent to which assistance is required varies according to age, disability, vulnerability, and gender. This might inform the staging or prioritisation of progressive access to basic services.

The performance of CMBS provision can be evaluated in respect of (a) their coverage and (b) their adherence to set norms and standards. Coverage by the income poverty programme does not currently extend to able-bodied adults without formal employment.

The lack of fiscal and institutional capacity constrains the progressive realisation of CMBS. Rapid take-up of the child support and disability grants is the primary cost-driver of deficit financing and may threaten fiscal sustainability. Institutional capacity to deliver is relatively high by developing economy standards but is variable across provinces and municipalities.

## 14.2 Aspects of Poverty Targeting

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### 14.2.1 Forms of Poverty Targeting

Testing involves eligibility screening and follow-up monitoring. Income can be tested through the personal income tax system but this is limited in the South African context, where the poor are generally not registered for personal income tax purposes. Means-testing of factors such as living conditions or asset ownership may leave much to the discretion of administrators unless an appropriate evaluation system is institutionalised.

Where eligibility depends on readily observable characteristics that are difficult to manipulate, such as age, gender, or race, problems of variable application are easier to manage. This is referred to as categorical targeting. Disability, vulnerability, and employment status, though well correlated with poverty, are characteristics that are easier to manipulate.

Community-based targeting involves delegating the tasks of eligibility assessment and monitoring to community-based organisations / NGOs or to school-heads / teachers, clinic / hospital administrators, and so forth. Whilst this reduces administrative costs, much is left to the discretion of evaluators.

Geographic targeting involves distinguishing spatial areas by a statistical analysis of poverty. Both the Provincial and Local Equitable Share formulae take account of poverty to some degree and hence redirect funding to poorer provinces and municipalities. The Integrated Sustainable Rural Development Programme (ISRDP) and the Urban Renewal Programme (URP) are forms of geographic targeting based on a range of poverty measures. Geographic targeting can be more precise when undertaken by local government for constituent communities.

Self-selection generally implies a parallel system of public provision that is subsidised on the one hand, and private provision that is of higher quality and cost on the other. Self-selection reduces the administrative costs of targeting but establishes barriers to upward mobility.

Public works programmes offering low wages will tend to self-select the poor. In more developed economies, welfare recipients are often obliged to engage in workfare. Alternatively, governments may subsidise [private] employment costs.

Commodity subsidisation involves the universal or targeted supply of basic services free or at lower than market prices. This can be effected through a differentiated sales tax system. Price controls can also be implemented, but these tend to reduce the long-term supply of these commodities.

### 14.2.2 Benefits and Costs of Targeting

The primary benefit of targeting is that it enables basic goods and services to be made available to those in need at the lowest possible revenue (as opposed to administrative) cost. Targeting may be considered a prerequisite for redistribution and poverty reduction in societies with high rates of poverty and limited fiscal resources.

Administrative costs of assessing eligibility and monitoring compliance vary between forms of targeting, with self-selection, community-based targeting, geographic targeting, income, and means-testing being successively more complex but accurate.

Targeting can induce potential recipients to change their behaviour to influence their eligibility. Compliance monitoring helps to limit such errors of inclusion. To the extent that errors of exclusion occur in the provision of basic services, progressive realisation of constitutional mandates may be compromised. Further, intended beneficiaries may be discouraged from taking up benefits if the costs (including stigmatisation) of establishing eligibility and obtaining the benefit are too high.

## 14.3 International Review of Poverty Targeting

Poorer countries tend to use simpler (though less accurate) targeting methods, such as geographical targeting, community assessment, and self-selection. Developing / emerging economies make more use of categorical targeting and means testing.

Poorer countries tend to employ commodity subsidies (especially on food) and public works programmes. This sometimes reflects a general lack of administrative capacity in the public sector but more probably the relative necessities of the very poor. Emerging national economies prefer the use of cash grants.

Comparable data across targeting programmes of various forms is difficult to acquire. A World Bank study in 2002 compared 111 targeting programmes in poor and developing countries that utilise 226 targeting methods. The basis of comparison was a performance indicator of benefit incidence, comparing proportions of benefits received by those in the poorest 40 percent of the population. In general, targeting is successful in redirecting resources to the poor (average score of 1.25 or 50 percent of benefits to the poorest 40 percent of the population). The maximum observed score of 2 implies 20 percent leakage from the poorest 40 percent of the population. Several programmes (including the food subsidy programme in South Africa) scored below 1, suggesting substantial errors of exclusion or inclusion.

The highest rated targeting methods are, respectively, self-selection on public works programmes, means testing, geographical targeting, and community-based targeting. Categorical targeting and commodity subsidies (such as VAT exemptions) are the most regressive. Use of multiple methods of targeting improves performance.

However, variability of performance is higher within targeting methods than between them, suggesting that the form of targeting is less important than factors such as administrative capacity, the quality of governance, and political voice.

Methodological gaps include (a) the impact on the area's poverty rate or income distribution, and (b) the relative financial and social costs and benefits of implementing different forms of targeting (for example, whilst means testing may be more effective in benefit incidence, it may be more costly to administer or take up).

Poverty is more accurately measured in terms of consumption than income because of the reliance of the poor on in-kind transfers and/or subsistence activities. Poverty levels can be measured against the cost of a basket of basic goods and services required to enable an adequate living.

Compared to capability or asset poverty, income poverty is more likely to be measured.

## 14.4 Poverty Targeting in South Africa

Social security is both categorically targeted and means tested. Norms and standards are set by national legislation. Take-up rates vary among provinces. This may reflect variable capacity of provincial governments to administer and of potential beneficiaries to take up the grants. Though coverage is far from universal, take-up rates have been high enough to crowd out the provision of other social services.

Social insurance contributions are made by those employed and hence benefits are restricted to those registered. Within the scheme, benefit incidence is progressive. The Unemployment Insurance Fund is endeavoring to widen the net to include all casual and domestic labour.

Social welfare services are provided by both Government and NGOs. Recipients may or may not be receiving social security grants simultaneously. Hence a provincially variable mix of categorical and means testing with community-based targeting is applied.

The HIV-AIDS pandemic places great challenges on both the social security and social welfare services in respect of the HIV-infected and -affected (notably children).

Public education is primarily financed through PES transfers, which redistribute revenue among provinces and hence serve as a provincial geographic targeting mechanism. The national Department of Education has introduced school funding norms specifying per learner subsidies that decline with household income. This implies a mix of geographic and community-based targeting, which may pose problems in situations where schools attract students from outside the proximate community. Parallel private and public schooling systems enable or compel self-selection. Differential fees within the public school system do likewise and may complicate targeting benefits to those most in need.

Self-selection between public and private sector services characterises the health function. Recently, public hospitals have been offering fee-paying services. National norms and standards are difficult to establish given the wide range of medical conditions and their severity.

The main instrument of housing policy is a targeted capital subsidy for primarily owner-occupied housing. The subsidy declines with housing income to a cut-off point of R3,500 per household per month, which has not been inflation-indexed since 1996. The subsidy is insufficient to finance a serviced site with a new house, and has largely been used for new household formation. This has served to reduce densities in former townships rather than, for example, housing poor migrants. Housing is not a separate category in the PES, but geographic targeting occurs through the conditional grant formula. Coverage is being extended to rental, social, and rural housing.

Provision of food is one of the more difficult constitutional rights to realise. Certain staple foodstuffs are zero-rated for VAT. Child nutrition programmes are implemented through the schooling system, implying community-based targeting. NGOs are also active in the field. The Department of Social Development offers emergency food relief.

Access to water is a key constitutional right. Municipalities are obliged to provide a minimum level of consumption free of charge for water and other municipal services. This system is in effect regressive since (a) it is universally applied rather than targeted and means-tested, and (b) it can only benefit metered households. Many municipalities implement indigent policies to provide relief to those too poor to pay full tariffs on municipal services. However, capacity to apply indigent policies varies widely between municipalities.

## 14.5 Towards a Research Agenda

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Essentially, two methods of evaluation are proposed. The first is to measure the percentage coverage of the target groups for each constitutionally mandated basic service and for income adequacy. The second is to measure the incidence of benefits on the poorest segments of the population, that is, the proportion of the benefits of basic service programmes accruing to, say, the poorest 40 percent of the population.

Broadly speaking, coverage is measured by comparing the number of beneficiaries with those eligible or targeted by a CMBS programme. Eligibility can be measured through the official Census or other statistical surveys, provided that categories correspond to the income classes or demographic categories being targeted through policy. A comparison of beneficiaries against those eligible provides an indication of either errors of exclusion or inclusion. Coverage in terms of income adequacy can be measured as the proportion of the population falling below some absolute income poverty line.

Coverage and benefit incidence measures may not take account of the quality of the service being provided. Comparisons between jurisdictions may be difficult in the absence of national (or international) norms and standards.

A combination of official income distribution and poverty surveys and independent household surveys of benefits received should enable calculation of benefit incidence on poverty.

### 14.5.1 Data Requirements

Both absolute and relative measures of poverty should be compiled. Absolute measures seek to define the

cost of the bundle of goods and services necessary to live adequately. Relative measures define poverty in terms of a jurisdiction's distribution of income.

A head count of the number of persons falling below the poverty line is a suitable measure of income poverty.

Empirical evidence suggests that public works programmes offering lower than average wages encourage self-selection by the poor and hence tend to secure the greatest benefits for the poor, with the minimum of errors of inclusion and the widest coverage. However, much will depend on project management, administrative capacity, and the quality of governance.

## 14.6 Proposals: Poverty Targeting

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Given Government's policy objective of finding the most sustainable means of poverty reduction, the following proposals are put forward:

- Government should consider measuring performance of the delivery of CMBS through progressive improvements in policy output and outcome indicators.
- Policy outcome measures could be chosen according to their capacity to achieve the strategic policy objectives of line function and inter-departmental budget programmes. In this regard:
  - Consideration should be given to the effect of time lags on the achievement of policy objectives.
  - Long-term analysis of trends and policy outcome measures should be consistent over time in order to determine effective performance in the delivery of services.
- Levels of poverty may be determined by the extent of the take-up rate of the basic services implied in the Bill of Rights and should be updated annually.
- Independent and official administrative instruments should be instituted to assess the impact of government programme benefits and the quality or level of the service.
- A more consistent and precise official definition of the employment status of the economically active population, taking into account all sources of income, should be put in place in order to facilitate programme planning and budgeting.
- Priority should be given to estimating the proportion of target groups that have access to the constitutionally mandated services listed or implied in the Bill of Rights.

## SECTION 15

# Review of Budgeting Systems for the IGFR System in South Africa

In its three previous submissions, the Commission made contributions to Government's project to improve planning and budgeting (see FFC Submission for the Division of Revenue 2003/04). As part of this process, Government is considering ways to measure service delivery outputs. Accrual output-based budgeting (AOBB) is under consideration in this regard. As part of its on-going contribution to the budget reform project, the appropriateness of AOBB for South Africa will be reviewed in this section.

The management information systems inherited by the public sector in 1994 do not enable the measurement of service delivery outputs or the calculation of per beneficiary costs of delivery. It is therefore difficult to evaluate the progressive access to constitutionally mandated basic services.

A management information system that integrates strategic, operational, and budgetary planning and can be evaluated against policy outcome, delivery output, and financial input indicators may generate the data required to enable the measurement of progressive realisation of constitutionally mandated basic services. Output-based budgeting techniques in an accruals accounting environment may be considered as a possible technique with which to orient public sector institutions to generate the necessary management information.

This section provides an overview of AOBB and other budgeting systems that have been used in a variety of jurisdictions throughout the world, and provides a brief assessment of the key characteristics of each. It then examines the adoption of accrual accounting and budgeting within the public sectors of a range of countries, with a view to assessing their relevance for South Africa.

## 15.1 Overview of Public Budgeting Systems

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Different public budgeting systems are used throughout the world. One means of analysing this diversity is to engage in a process of classification. There are at least two methods for this, namely classifying budgeting systems on the basis of their underlying accounting methodologies, or classifying them on the basis of their mode of control. The key features of each classification are set out below.

Accounting-based taxonomy:

- Cash-based systems;
- Modified cash / accrual systems;
- Full accrual systems.

Mode of Control taxonomy:

- Line item (input) budgeting;
- Performance budgeting;
- Planning Performance Budgeting Systems (PPBS);
- Zero-based budgeting;
- Cutback budgeting;
- Output-based budgeting.

Historically, budgets have focused on inputs (that is, “cash-based budgeting”). This is a reflection of the primary accountability focus of budgets. Calls for greater efficiency, effectiveness, responsiveness, and accountability have been implied in the modification of cash-based budgeting in many jurisdictions. However, the assumption that adoption of alternative budgeting methodologies will result in improved resource management and efficiency outcomes must be treated with caution. Jurisdictions currently contemplating the implementation of such modifications could benefit from a review of the impact of budget reforms in other jurisdictions.

## 15.2 Claims about Accrual Output-Based Budgeting (AOBB) Systems

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Proponents of AOBB claim that traditional cash-based budgeting is flawed because it only captures information about a small part of the goods/service delivery cycle (inputs). It does not require governments to fully recognise all resources commanded, and therefore cash-based budgeting does not measure “full” costs.

Arguments in favour of AOBBS include:

- Increased customer focus.
- Concentration on the supply of products / services.
- Theoretical and practical separation of purchaser and owner.
- Reflection of “full” costs as measured on an accrual basis.
- Provision of a conceptually sound basis for internal and external resource allocation.
- Focus on the production of outputs and the achievement of outcomes, leading to better management and value for money.
- Increased analytical capability, particularly with respect to the asset and liability position of Government.

Theoretically, accrual-based budgets should improve resource management since they explicitly take into account the full range of resources used by governments in producing outputs. As a result, they should provide information more useful for resource allocation decisions.

### 15.3 Who has moved to accrual?

Table 5: Accrual Financial Reporting By Budget Funded Agencies

	Full Accrual Basis	Modified Accrual Basis	Cash Basis With Supplementary Accrual Data
Australia	X		
Belgium			X
Canada		X	
Finland	X		
Germany			X
Hungary			X
Iceland		X	
Ireland			X
Japan	X		
Netherlands	X		
New Zealand	X		
Portugal	X		
Sweden	X		
Switzerland	X		
United Kingdom	X		
United States	X		

Source: Modified from OECD (2002), *Accrual Accounting & Budgeting*, Tables 3 and 4.

Despite the relatively widespread adoption of accrual-based accounting and financial reporting, this is merely a precursor to the implementation of AOBB systems, which are presently in place in only a small number of jurisdictions, including New Zealand, the United Kingdom, and some Australian jurisdictions. Therefore, AOBB should arguably be seen as a nascent rather than fully developed approach.

## 15.4 Assessment of the Effectiveness of AOBB

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Despite the fact that AOBB systems are relatively recent, researchers have begun to produce evaluations of AOBB systems in practice. In evaluating these systems, it is necessary to be explicit about the structural characteristics of these systems and how they relate to other elements of the public financial management infrastructure.

The chief factor differentiating AOBB systems from budgeting systems that focussed on the management of outputs and performance is the market clearing mechanism. Rather than acting as a funnel for the channelling of resources from central financial agencies to line (operating agencies), the AOBB system acts as an information hub for compiling information about the outputs that purchasers (normally ministers responsible for a particular portfolio area such as health or education) wish to procure in order to pursue the implementation of their policy agendas, and the cost of acquiring those outputs. Theoretically, any public or private entity could submit information into this hub for the purpose of bidding to provide goods and services. The AOBB system therefore also acts as a market clearing mechanism, putting purchasers in touch with providers best able to meet their price, quality, and quantity specifications.

AOBB protagonists assert that efficient market clearing prices for goods / services will be implied via the operation of the AOBB system. However, in Australia, two key distortions are present and arguably undermine this goal, namely: (a) widespread adoption of replacement costing by public sector agencies; and (b) implementation of capital charging systems in several jurisdictions (New Zealand, UK, several Australian jurisdictions).

Both distortions are likely to cause the cost structures of public sector agency producers to appear inflated and therefore uncompetitive when compared against private sector competitors who apply different accounting rules (that is, historical cost accounting and implicit rather than explicit capital costing).

Arguably, therefore, many of the “savings” generated as a result of the operation of the system are illusory. This may be leading to inappropriate contracting out / outsourcing decisions, as well as to biased expectations of the benefits to be gained from such exercises. It is speculated that this may lie behind the reason that so many Australian outsourcing initiatives have failed to live up to expectations in terms of cost improvements. Similar observations have recently been made in relation to the New Zealand experience.

In addition, there are serious concerns as to whether the contractual hubs at the heart of AOBB systems perform in the manner protagonists suggest they ought. Although contestable contractual exchanges lie at the heart of the expectations of efficiency gains derived from AOBB systems, it is not clear that these necessarily produce desired efficiency gains.

This raises a number of questions. For example, do measurement and accounting considerations introduce distortions? Will single period gains translate into sustainable multi-period gains? Will contractual exchanges be characterised by the good faith and transparency associated with relational contracting, or by zero-sum game fixed-value transfers associated with hard one-off bargaining? How might the mode of bargaining impact on the degree of savings and benefits accruing to parties? Will transaction and monitoring costs associated with the move to a contractual exchange model outweigh apparent direct cost benefits? Are other introduced risks (operational, financial) able to be measured and controlled, and what procedures are in place to promote their being borne by the most appropriate party?

Another argument in favour of the implementation of AOBB systems is that they result in the production of better quality management information, facilitating performance improvements through improved management insight. Arguably, in order for AOBB systems to support this expectation and to deliver tangible benefits, key structural elements of the system including inputs, processes, outputs, and outcomes must be clearly defined and manageable. However, a range of published research contains evidence that this has often not been so.

Further, in order to promote organisational learning, it is desirable that output and performance measure structures should be relatively stable so that a reflexive learning process results. Empirical analysis of AOBB systems has suggested that this expectation has not been met. Rather, published studies have demonstrated that structural volatility in some implemented AOBB systems has increased post implementation. In one recent study, which reviewed output groups and individual classified outputs across the entire Victorian (Australia) public sector, the results revealed high levels of volatility in measures of output structure (survival, novelty, number). The analysis led to the conclusion that the degree of volatility was increasing (on average) across time, and that “bedding down” post implementation explanations were not valid. Further, the structural volatility suggested that the organisational learning benefits of AOBB implementation were unlikely to have materialised in practice.

In addition to concerns about the operation of the market hub and the lack of credible evidence supporting contentions of enhanced organisational learning, surprisingly little evidence is available in relation to the full cost of implementing AOBB systems. The Commonwealth Government in Australia is reported to have spent AUS \$35m on direct software and training costs associated with the implementation of AOBB. The Canadian Government has spent even more for a partial system. In addition, a number of Australian states have implemented the system, and it would seem that there are a high number of indirect costs introduced as a result of the implementation of AOBB systems. The potential for a costly implementation phase, followed by higher resource consumption post implementation (owing to the need for more skilled staff, etc) represents an important but unmeasured risk associated with the adoption of AOBB systems.

The empirical evidence therefore suggests that there may be a significant gap between what has been promised by AOBB and what has been delivered.

## 15.5 Issues for Further Investigation

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Before Government decides to fully adopt an AOBB-type system, four key categories of evaluative criteria need to be researched and examined in details.

### Costs

- Can the direct and indirect costs of implementation be reasonably quantified?
- Can future period incremental costs (or savings) be reasonably quantified?

### Capabilities

- What incremental human resource and technology needs will arise as a result of the decision to implement the new system?
- To what extent can these identified requirements be sourced locally within reasonable cost and time constraints?

### Incentives

- Does the proposed system reduce agency / counter-party incentives to provide inaccurate estimates of future period resource needs / capacity to contribute resources?
- Does the system reduce agency incentives to engage in sub-optimal resource allocation decisions?

### Results

- Does the system allow greater targeted flexibility in resource deployment on an intra- and inter-period basis?
- Does the system provide accountability information flows of equal or better quality than its predecessor?
- Does the system stimulate the capacity to produce a greater quantity or quality of outputs for the same injection of resource, or the same quantity / quality for a smaller resource allocation?

Investigative research on the role of budgeting systems and techniques in intergovernmental fiscal relations will provide a sound basis for deciding on the appropriateness of a system for South Africa. Interactions between the structural properties of the government budgetary management systems in South Africa have the capacity to impact on the degree to which mandated services are delivered efficiently and effectively.

While most research relating to budgeting has focused on the operation of a budgeting technology within a particular sphere or organisation, this proposed research would focus on the manner in which the budgeting systems of the different spheres interact and mediate efficiency and resource allocation.

It cannot be taken for granted that the budgetary management systems of the three spheres of government in South Africa co-operate in a harmonious fashion. To some degree, the two key problems of information asymmetry and incentive incompatibility characteristic of all budget systems pose greater challenges for achieving effective budget harmony in the intergovernmental fiscal system in South Africa. These problems have to be addressed before any attempt is made at implementing an AOB-type system in South Africa.

First, the problem of information asymmetry arises in any setting where there is distance and thus a lack of observability between the provider and user of resources. A purely top-down allocation framework (with no input from ultimate resource users) may result in a chronic mismatch between resource requirements and resource injections (excessive or inadequate allocations are both possibilities), while a bottom-up allocation framework in which allocation bids are first generated by end-users often results in an exaggeration of demand relative to capacity to deliver the required output.

The higher the degree of information asymmetry between resource providers and resource users, the greater the risk that the actual quantum of resources will differ materially from the optimal level of resources required to produce outputs. In the event that there is no information indicating that the services / resources provided exceed actual requirements, there may be few incentives for resource users / consumers to signal this fact. In this case, asymmetry will lead to inefficient resource usage. In the opposite case, where demand is greater than supply, user / consumers will have strong incentives to signal the deficiencies in their resource allocations. However, in the absence of other compensatory measures, these signals may lack credibility.

The second problem of incentive incompatibility refers to the manner in which the structure of the budget management system induces actors to undertake actions that promote self-interest at the expense of the organisation as a whole. Structural problems such as a lack of flexibility in relation to the timing or method of resource allocation can reinforce these difficulties, even in circumstances where the results are highly visible.

A simple example will illustrate. Consider a budget structure in which the funding formula calculates future cycle spending as consisting of past period spend plus or minus some adjustment. In such a setting, the incentive provided to the funding recipient will be to expend funds by a particular cut-off date, irrespective of need in that period or future periods. Ironically, if actual spending capacity is strictly capped at initial budget levels, this type of behavioural response will make it impossible to distinguish between those functions which were under-resourced (all budgeted funds will have been expended) and those which were over-resourced (all budgeted funds will also have been expended, but for different reasons).

The structural problem driving the incentive incompatibility can be described as a lack of budgeting system flexibility. That is, actors who are not in a position to transfer resource allocations between periods or who

would be penalised for doing so will attempt to spend all funds irrespective of requirements. This will result in possible negative consequences for resource allocation, deployment, and consumption efficiency. One well-known response to the problem outlined above is the so called “year-end spend-up”, a classically dysfunctional behavioural response. One party (the funding recipient) is induced to act in such a way as to diminish value for the funder by consuming resources which could otherwise have been deployed to better effect elsewhere.

Complex budgeting systems contain many such embedded structural problems. A research programme focused on the identification of key areas of information asymmetry between spheres of government and key drivers of incentive compatibility problems could contribute significantly to the improved management of intergovernmental fiscal relations in the South African context.

## 15.6 Conclusions

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The more recent versions of output-based budgeting systems in countries such as Australia, New Zealand, and the United Kingdom have been complex and costly to implement, but as yet there is no compelling evidence to support the claim that they result in performance improvements. There are many complex technical questions that remain unresolved. One example is the appropriate treatment of the cost of capital for public sector entities when determining the cost of outputs they produce. Asset valuation and related depreciation charges have also proved complex and contentious issues.

These complex systems rely on an intricate contractual infrastructure in order to function. This infrastructure is highly resource-intensive in that it requires considerable investment in writing, updating, and monitoring contractual arrangements. Yet even such a complex and costly system may create incentives for actors to engage in dysfunctional behavior.

Typical dysfunctional behaviors induced by weaknesses in budget structures and information asymmetries can result in inefficiencies. Systemic action to improve the structural and incentive characteristics of public budgeting systems can therefore stimulate considerable improvements in performance.

Rather than focusing solely on the type of budgeting infrastructure used, then, reforms based on removing incentive compatibility problems and dysfunctional behaviour may prove better targeted and more effective in the short and medium term.

## 15.7 Proposals: Principles for the Review of Budgeting for the IGFR System in South Africa

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- Any attempt to introduce performance-based budgeting systems principles should be evaluated on the basis of:
  - their capacity to stimulate a greater quantity or quality of service outputs, or an improvement in policy outcomes, for the same injection of resources;
  - whether accountability information flows are improved;
  - whether additional costs (or savings) are incurred from the human resource and technology requirements of such reforms;
  - whether implementation is feasible given projected constraints on the availability of appropriate human and technological resources.
- Fiscal management reforms should be based on the principle of aligning the performance incentives of subnational governments with national policy objectives.
- Research should be conducted on identifying (a) the specific information resources of each sphere of government, which ought to be shared to enhance efficient delivery and effective outcomes, and (b) the incentives of different spheres of government to conceal resources, exaggerate demand, or waste resources at year-end.

## ANNEXURE A

# Econometric Analysis of Provincial Revenues and Expenditures in South Africa

This annexure presents the results of the econometric analysis of the determinants of provincial revenues and expenditures in South Africa. With respect to revenues, the objective is to establish whether the per capita revenue in provinces is related to any of the identifiable factors representing taxable capacity. In the case of expenditures, the analysis attempts to examine whether the expenditures in provinces are related to various identifiable variables representing cost disabilities in provinces.

One of the major problems in undertaking econometric analysis of revenues and expenditures is that in any cross-section frame, there are only nine observations relating to the nine provinces in the country. One way to deal with this problem of limited degrees of freedom is to combine cross-section observations over a given time period in the econometric analysis. In this exercise, the cross-section observations over the period 1997/98 to 2001/02 have been combined in the estimation.

In order to separate time-specific and province-specific effects, a “fixed-effects” model has been employed for estimation. In the “fixed effects” model, it is assumed that the province-specific effects remain “fixed” or constant and do not vary in combination with other variables. However, such “fixed-effects” models allow for differences in the intercept among different provinces. In other words, this model assumes that the effect (slope) of different economic variables on per capita revenues is identical across different provinces, but the level of relationship of different provinces with per capita revenues (intercept) could vary.

Thus, in the analysis of revenue, the following equation was estimated:

$$R_{ij} = f(A_{ij}, T_i, P_j)$$

Where  $R_{ij}$  represents the per capita revenue of province  $j$  in time period  $i$ , and  $A_{ij}$  represents the vector of economic variables representing revenue capacity of the province  $j$  in time period  $i$ .  $T_i$  are the dummy variables for the time period, taking value one for the year and zero otherwise, and  $P_j$  denotes the dummy variables taking values of one and zero for various provinces. The estimated equation is linear.

Similarly, to analyse the expenditures, the following equations were estimated:

$$E_{ij} = f(A_{ij}, T_i, P_j)$$

Where  $E_{ij}$  represents the per capita expenditure of province  $j$  in time period  $i$ , and  $A_{ij}$  represents the vector of economic variables representing expenditure need variables of province  $j$  in time period  $i$ .  $T_i$  are the dummy variables for the time period, taking the value one for the year and zero otherwise, and  $P_j$  denotes the dummy variables, taking values of one and zero for various provinces. As in the case of revenues, linear equations are estimated for expenditures.

### Analysis of per capita revenues

As mentioned above, the “fixed effects” model is employed to estimate the effects of various explanatory variables on per capita revenues. It combines the cross-section observations of provinces over five years from 1997/98 to 2001/02. Two alternative linear models are used for estimation, one with only province-specific effects, and the other with both province-specific and time-specific effects. The explanatory variables included in the revenue regressions are per capita GDP, extrapolated estimates of the poverty ratio, and the proportion of urban population.

Table A1: Determinants of Own Revenues of provinces

Independent variables	Equation 1	Equation 2
Constant	77.7031 (3.369)	
Per capita GDP	-7.09E-05 (0.9407)	0.0044 (1.0295)
Poverty ratio	-1.053410 -(2.7525)*	-(0.2046) -(0.3950)
Per Cent Urban Population	0.8489 (3.5757)*	
Time Dummy 1998/99	-5.1810 -(0.5077)	-8.8933 -(0.0857)
Time Dummy 1999/2000	24.8344 (1.9915)***	2.1157 (0.1225)
Time Dummy 2000/01	29.909 (2.2750)**	0.5734 (0.0025)
Time dummy 2001/02	42.5991 (3.0275)*	4.6123 (0.1557)
Provincial Effect- Eastern Cape		24.0256 (0.4693)
Free State		39.3036 (0.5376)
Gauteng		-16.6374 -(0.1118)
KwaZulu-Natal		24.4455 (0.3888)
Mpumalanga		1.0806 (0.0130)
Northern Cape		36.8724 (0.4596)
Limpopo		19.6395 (0.4207)
North-West		26.5608 (0.3582)
Western Cape		49.2910 (0.4437)
$\bar{R}^2$	0.7236	0.7645
F – Statistic	17.4576*	11.2040

\* significant at 1% level

\*\* significant at 5% level

\*\*\* significant at 10% level

Both the equations have high explanatory powers. In the case of the equation separating both time- and province-specific effects, none of the explanatory variables is significant. On the other hand, the equation with time effects shows that the poverty ratio and urbanisation variables are significant explanatory variables while per capita GDP is not.

Given that much of the own revenue is raised from motor vehicle licenses and gambling fees, it is not surprising that urbanisation is a significant determinant. Since, by and large, relatively urban provinces also have higher per capita GDP, the latter variable is not significant. Similarly, the negative relationship between per capita revenue collections and poverty ratio is explained by the fact that the density of vehicle population and gambling activity are lower in provinces with higher concentrations of poor people.

### Analysis of expenditures

When per capita aggregate revenues (including transfers) accruing to the provinces and their per capita expenditures are regressed with per capita GDP, along with other important “need” variables and those representing the cost disability such as density of population and poverty ratio, the above inference is no longer true. To examine the relationship of per capita expenditures – both aggregate and on education and health sectors (separately) – with various need and cost variables, linear regressions are estimated by pooling five cross-section observations from 1997/98 to 2001/02. This has been done to ensure adequate degrees of freedom. The pooled regressions are estimated in the “fixed effects” model with two alternative specifications. The first one specifies the economic variables along with time dummies, and the second has both time- and province-specific dummies, as in the case of own revenue equations discussed earlier.

Table A2 presents the results of estimating the equations on per capita revenue accruals in provinces and per capita aggregate expenditures. Interestingly, in terms of statistical properties, the economic variables are significant in the equations without provincial dummies. When provincial dummies are added, the coefficients of the economic variables become insignificant and all provincial dummies are significant. In the case of urbanisation, the data are available for only one year and the same has been repeated in other years. This would be equivalent to province-specific effects and therefore, when the province specific dummies are introduced, the urbanisation variable is not included.

The results show that revenue and expenditure allocation, *ceteris paribus*, has a negative relationship with per capita GDP. This indirectly indicates that the transfer system as a whole has an equalising impact. It is also seen that per capita expenditures are higher in provinces with greater urbanisation. The significant negative relationship with density of population implies that sparsely populated provinces have had to incur higher per capita expenditures and this has happened despite the fact that this cost disability has not been included in the design of the PES formula. However, as the PES formula does not directly take into account the incidence of poverty in different provinces (except the social development component and to an extent the backlogs component), the poverty variable is not significant. This implies that the expenditure distribution among provinces does not take into account the problem of poverty.

The inferences drawn above are based upon the equations without province-specific dummies. When the intercept dummies are introduced to separate province-specific effects, none of the economic variables is significant. In other words, if province-specific effects are taken into account, the transfer system has no impact on equalisation of the expenditures.

Table A3 presents regression results of the education and health sectors. In the case of education expenditures, in addition to the two equations estimated in the “fixed effects” model pooling the observations for five years, two more equations have been estimated pooling three years beginning 1999/2000. The reason is that learner–educator ratio data are available for only these three years.

Table A2: Regression Results

Independent Variables	Total Revenue		Total Expenditure	
	Equation 1	Equation 2	Equation 1	Equation 2
Constant	2464.453 (16.4321)*		2262.067 (12.6081)	
Per capita GDPR	-0.0417 -(6.7720)*	-0.0213 -(1.5123)	-0.0196 -(2.1541)**	-0.0245 -(1.2273)
Density			-1.2034 -(3.6698)*	4.6140 (0.9821)
Poverty ratio	-2.1751 -(0.8740)	2.6437 (1.5785)	2.6071 (0.9188)	2.9932 (1.8441)
Per Cent Urban Population (6.7114)*	10.3619	(5.6379)*	9.1043	
Time Dummy 1998/99	132.5004 (1.9966)**	115.8246 (3.5677)*	-31.4291 -(0.4806)	-35.2383 -(1.1240)
Time Dummy 1999/2000	332.4697 (4.0998)*	214.6895 (3.8431)*	-16.7093 -(0.1913)	-28.3087 -(0.4891)
Time Dummy 2000/01	584.1639 (6.8330)*	434.3424 (5.9142)*	209.238 (2.1865)**	197.2524 (2.4554)**
Time dummy 2001/02	755.1109 (8.2525)*	568.7460 (5.9383)*	483.5706 (4.5309)*	472.6306 (4.3346)*
Provincial Effect- Eastern Cape		2483.198 (15.0022)*		2425.048 (15.0907)*
Free State		2576.084 (10.8974)*		2689.647 (10.2580)*
Gauteng		2652.64 (5.5133)*		1192.538 (0.9087)
KwaZulu-Natal		2297.63 (11.3015)*		2035.739 (6.4284)*
Mpumalanga		2330.46 (8.6898)*		2373.602 (8.6807)*
Northern Cape		2880.296 (11.1046)*		3177.894 (8.9281)*
Limpopo		2301.642 (15.2506)*		2272.586 (13.8445)*
North-West		2411.702 (10.0601)*		2466.879 (9.9014)*
Western Cape		2944.92 (8.1987)*		3030.426 (7.3137)*
$\bar{R}^2 =$	0.7413	0.9455	0.7628	0.9533
F – Statistic	19.0082*	55.5295*	18.69*	60.9975*

N= 45.

\* significant at one per cent level

\*\* significant at five per cent level

\*\*\* significant at ten per cent level

Table A3: Regression Results: Education and Health Sectors

Independent Variables	Education				Health	
	Model 1	Model 2	Model 1 N= 27	Model 2 N=27	Equation 1	Equation 2
Constant	819.8341 (12.436)		602.1633 (4.4879)		302.7905 (8.9358)*	
Per capita GDP	-0.0063 (-4.797)	0.0035 (-0.652)	-0.0031 (-1.3395)	-0.0109 (-1.4529)	-0.0052 (-1.4825)	-0.0049 (-0.6300)
Enrolment ratio	-467.732 (-7.411)	-342.525 - (-4.2734)*	-399.6861 (-3.4861)	-197.3498 (-1.5109)		
Learner – Teacher ratio			0.6391 (0.3012)	2.3760 (1.0196)		
Density	-0.0345 (-0.556)	1.1012 (0.848)	-0.0919 (-1.0545)	2.8438 (1.3487)	0.1859 (1.1995)	1.6373 (0.8236)
Children<5 and Elders>65					0.0057 (3.7658)*	0.0005 (0.6545)
Poverty ratio	0.995 (1.782)		2.3352 (2.236)**			
Per Cent Urban Population	0.2981 (0.023)				5.2639 (6.7326)*	
Time Dummy 1998/99	0.298 (0.023)	-3.732 (-0.428)			8.3324 (0.2660)	5.4446 (0.4322)
Time Dummy 1999/2000	-13.729 (-0.811)	-5.759 (-0.492)			-58.6762 (-1.4319)	17.0087 (0.7341)
Time Dummy 2000/01	-6.846 (-0.367)	-0.409 (-0.024)	4.6479 (0.3552)	20.8789 (1.939)@	-16.1657 (-0.3653)	62.1032 (1.953)@
Time dummy 2001/02	8.426 (0.409)	11.064 (0.457)	15.5074 (0.9660)	45.6474 (2.250)**	110.0772 (2.8243)*	131.9186 (3.4312)*
Provincial Effect- Eastern Cape		717.825 (8.416)*		484.0736 (3.0201)*		468.1636 (3.4313)*
Free State		666.721 (5.590)*		524.6377 (2.6683)*		632.4951 (7.3873)*
Gauteng		210.0458 (0.563)		- -388.4601 (-0.6607)		267.7446 (0.4822)
KwaZulu-Natal		563.201 (4.614)*		257.8857 (1.3023)		482.4679 (3.7926)*
Mpumalanga		661.549 (5.417)*		517.6255 (2.6040)*		383.4614 (4.1041)*
Northern Cape		682.199 (4.927)*		591.4149 (2.5982)*		546.8438 (4.2308)*

Limpopo		685.404 (8.042)*		465.0820 (2.9598)*		358.5806 (6.4385)*
North-West		527.914 (5.689)*		491.0334 (2.7233)*		407.8170 (5.0693)*
Western Cape		602.358 (4.005)*		539.2159 (2.338)**		810.2642 (5.2029)*
$\bar{R}^2$	0.873	0.949	0.8698	0.8438	0.7859	0.9698
F – Statistic	38.685	56.035	25.8183*	21.0642*	21.189*	95.1729*

\* significant at one per cent level

\*\* significant at five per cent level

\*\*\* significant at ten per cent level

In the case of education, expenditure per school-going child is taken as the dependent variable. Expenditure per child is negatively related to per capita GDP as in the case of aggregate per capita expenditures. However, it has no relationship with density of population or urbanisation. In general it is also not related to the poverty ratio though it is significant in the pooled regressions for three years. Interestingly, expenditure per school-age child is negatively related to enrolment ratio. This is not surprising as the children in the age group 6-17 get twice the weight of enrolment in the education component of the PES formula. Since the former variable is in the denominator of the enrolment ratio, the variable is negative and significant. This result essentially underlines the inherent inequity in the PES formula for education. Another interesting feature is that for the three years for which learner-educator ratio data are available, the poverty ratio variable is not significant. The density and urbanisation variables indicate that education expenditure has no relationship with cost disabilities. This again highlights the shortcomings of the education component of the PES formula.

In the case of the health sector expenditures, per capita GDP is not significant, which implies that progressive distribution seen in the case of education expenditure is not seen in health expenditures. An interesting result is that per capita expenditure on health is significantly related to the medically vulnerable population (children below 5 years and elders above 65 years). However, health expenditure in provinces has no relationship with any of the cost disability factors included in the regressions, namely, density of population and urbanisation.

## ANNEXURE B

# A Provincial Capital Grant Model for South Africa: Technical Analysis

*September 2003*

### 1. Introduction

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The purpose of this Annexure is to provide a detailed analysis of the Provincial Capital Grant Model (PCGM) as developed up to September 2003. A Manual, which describes how the PCGM and its input database have been programmed within two Excel spreadsheet files, is also available. The Manual shows in detail how the policy maker can use the PCGM to run grant simulations for South Africa.

The goals of the Model are twofold. The first is to provide a grant mechanism that can be used for the objective and equitable allocation of capital funds to address provincial infrastructure backlogs inherited from the past. The second is to provide the basis for a capital grant model designed to address South Africa's overall deficiency of infrastructure for the provision of basic services such as health and education in a rational manner. Attainment of this second goal will contribute to future economic growth and prosperity by raising the rate of human capital formation.

To achieve these twin goals the grant model has two components: a "domestic backlog" part intended to correct for the domestic backlogs, and an "equal per capita" part that addresses the overall issue of human capital formation. It is intended that once the historical backlogs have been eliminated, the domestic backlog part of the model will be phased out, leaving only the equal per capita component as the basic model for the allocation of capital grant funds in South Africa.

Before commencing the technical discussion, it should be noted that, in common with other models, the Model presented here cannot solve all of South Africa's infrastructure problems, or provide detailed "micro" information on how capital should be spent and allocated within each Province. This is so for three reasons. First, it is impossible to capture every aspect of reality in any model. Second, there are serious data restrictions in a transitional economy such as South Africa's that limit how much detail and precision can be captured by models. Third, the more complex any model becomes, the more difficult it is for policy makers and politicians, the people who are responsible to their electorates for their decisions, to understand it. Greater complexity also introduces more data errors (see discussion of the data base) as one is forced to make additional assumptions.

Given these considerations, a fine line had to be tread between capturing those aspects of reality that can be seen as important and constructing something that is not too complex or requires data that does not exist at this time. In addition, the model provides only "broad orders of magnitude" in its attempt to indicate how one should logically divide a pool of capital grant funds to the provinces.

One can also think of the results produced by the model as a "starting point" in estimating grant allocations in any period. The Commission may also need to develop other indices (for example, which take account of "disabilities" in the different provinces associated with providing capital) that are then used to adjust the starting point estimates provided by the backlogs model. As with all grant models, some intuition may also be required in developing the final grant allocations to be used in practice.

The structure of the annexure is as follows. Section 2 provides a list of important definitions. Section 3 sets out and explains the formulas needed for implementation of period one of the scheme. Sections 4 and 5 do the same for periods two and three. Section 6 discusses the input database, while Section 7 presents a sample simulation. Section 8 concludes.

## 2. Definitions

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Before explaining the details of the model, the following definitions are necessary:

$t$  = a time index which can take on the values 1,2 or 3 (to denote periods).

$K_t$  = Value of the actual capital stock (1995 constant prices) for all Provinces in South Africa in period  $t$  for the constitutionally mandated basic services (education, welfare, health, transport and housing).

$K_{i,t}$  = Value of the actual capital stock (1995 constant prices) for Province  $i$  in period  $t$  for education, welfare, health, transport and housing.

$P_{i,t}$  = Population of Province  $i$  in period  $t$  (Stats SA data).

$P_t$  = Population of South Africa in period t (Stats SA data).

$CP_t$  = Capital grant pool in period t (derived from macroeconomic forecasts with policy input or could be given as a policy parameter).

$0 \leq \delta_t \leq 1$  = Proportion of the capital grant pool allocated to domestic backlogs (policy parameter).

These definitions are now used in developing and explaining the Model's formulas.

### 3. Period One

As noted above, the Model estimates a "domestic backlog" for each province for the first period in which the scheme is to operate.<sup>13</sup> The domestic backlog measures a province's public capital deficiency relative to a South African standard (it is for this reason that it is referred to as a domestic backlog), and is a measure of the historical backlog. The following analysis shows how the domestic backlog is estimated.

#### 3.1 Historical Domestic Backlogs

A measure of the amount of capital required for the provision of constitutionally mandated basic services is necessary. There are several ways to do this. One would be to use per capita minimum standards developed for each of the services to estimate the amount of capital that a province would require to meet such standards. Comparison of these standards against a province's actual capital stock would yield a measure of the domestic backlog for each province. Though appealing for many reasons, the problem with this approach is that there are no commonly agreed upon and consistent minimum standards for all the provincial services of interest. Thus, it is not feasible to use this approach at present though it may be at some stage in the future if adequate indices of minimum standards become available.

Therefore, it is proposed that a simple per capita average be used as the standard against which to compare each province in deciding on whether it has a backlog. The measure of the per capita value of the provincial sectors' capital stock for period one is,

$$\frac{K_1}{P_1}, \quad (1)$$

where  $K_1$  and  $P_1$  are as defined previously (Section 2). From now on, the above is referred to as the domestic standard capital stock, for period one. Formula (1) is a measure of how much public capital provinces have, per capita, for the whole of South Africa.<sup>14</sup>

13. Note that a period may be of any length, such as three years.

14. The standard could be calculated in other ways. For example, one might take an average for only the richer provinces or use the richest province as the standard. This would yield a higher standard than the simple average and hence allow more provinces to receive the domestic backlogs grant (discussed below).

The use of a per capita average in this way must be treated with some caution since it may “mask” service specific backlogs within a region. For example, consider a province with large deficiencies in infrastructure for housing but more than adequate infrastructure for all of its other services (it was pointed out in discussions that Gauteng was such a province). The aggregate measure of the province’s capital stock, together with the use of an average for the standard, may indicate an overall “surplus” of capital for the province, thus masking the fact that there is a deficiency for one particular service.<sup>15</sup> One can see from this example that the use of an average to calculate a standard is, therefore, a relatively simple way to measure needs.

However, as can be seen below, it is proposed that all provinces also receive an equal per capita allocation from some portion of the capital grant pool. To some extent, this allocation will overcome the masking effect resulting from the use of a simple average for calculating a domestic standard. A province such as Gauteng which, as can be seen below, does not have a domestic backlog when estimated using an average, will still receive an equal per capita allocation for capital spending from the grant pool. A policy decision would need to be made within the province to use this equal per capita allocation to address housing backlogs.

It should also be remembered that there are substantial benefits from using an average to set the domestic standard. It has intuitive appeal to notions of equity or fairness and is feasible, since as noted above, there is no other way, at present, of constructing a domestic-based standard for capital. Using an average as the standard also “de-politicises” the process of estimating the standard, since it is based on a pure mathematical calculation with no policy parameters debates based on “rent seeking” behaviour.

Next, the aggregate amount of capital that each province requires in order to achieve the domestic per capita standard is defined. For Province *i* in period one, this is just the per capita standard from (1) multiplied by the Province’s population:

$$\frac{K_1}{P_1} \cdot P_{i,1} \tag{2}$$

Thus, (2) is the amount of capital needed in province *i* if that province is to achieve the South African average (standard) as defined in (1). Whether or not a province has a domestic backlog depends on how its actual (aggregate) capital stock deviates from the capital stock required to achieve the domestically determined standard. This can be calculated for province *i*, for period one, by taking the capital required to achieve the per capita standard and deducting the actual capital stock in the province:

$$B_{i,1} = \left( \frac{K_1}{P_1} \cdot P_{i,1} - K_{i,1} \right) \tag{3}$$

Provinces with  $B_{i,1} > 0$  (a positive capital backlog) have a deficiency in their capital stock in the sense that it is inadequate to achieve the domestic standard, as determined from (1). Provinces assessed with  $B_{i,1} < 0$  have a negative backlog based on the domestic standard. Their capital stock exceeds what is required to

15. Unfortunately, it is not really feasible to convert “surplus” infrastructure used for providing, say, health, into housing infrastructure.

achieve the standard. Finally,  $B_{i,1} = 0$  implies that a province has no domestic backlog. The capital stock in such a province is equal to what it needs to achieve the South African average.

Currently, the Model does not account for the fact that a rand provided for the provision of capital will not yield an equivalent flow of services across all provinces because of differential cost disabilities faced by the provinces. For example, in the Northern Cape it may be more expensive to provide a school educating 30 children in a remote area than it costs to provide the same capacity school in a suburb of Johannesburg. Disabilities may arise because of factors such as:

- Economies/diseconomies of scale in the provision of government services.<sup>16</sup>
- Population dispersion within provinces (this will vary according to geographic factors and differences in population size).
- Differences in health factors across provinces.
- Differences in the ethnic make up and age/sex composition across provinces.
- Variations in the geographic concentration of poor people within provinces.

One can argue that such disabilities should be taken into account by the Model, both in terms of how they might affect the domestic backlogs, and their impact on the equal per capita allocation (the Australian equalisation model takes into account such disabilities). A full discussion of capital cost disabilities, and their measurement using cost functions and time series cross-section techniques, is provided in Petchey, Shapiro, MacDonald and Koshy (2000).<sup>17</sup>

At present there are no measures of capital cost disabilities for South Africa. However, it is suggested that such research be conducted as soon as possible, since incorporating disabilities into the Model is likely to have some impact on the measurement of the domestic backlogs and the equal per capita allocation made by the Model. In the meantime, however, it is perfectly valid to use the Model as it is for capital grant allocations until such time as the refinements for cost disabilities are incorporated.

### 3.2 Equal Per Capita Grant

As noted in the Introduction, one can argue that all provinces in South Africa have a capital deficiency when compared against international standards. This was discovered in the simulations undertaken with the first FFC Provincial Capital Grant Model using the Australian States as a standard. Such a deficiency arises because South Africa is a transitional economy.

It is proposed that all provinces should receive a grant from the pool to help them overcome the overall shortage of public capital at the provincial level for the constitutionally mandated basic services (education, health, welfare and transport and housing). Grants allocated to the provinces as an equal per capita allocation therefore have a clear economic goal: to raise public capital formation and hence future economic growth. This component of the grant Model can be seen as being of a long run nature. Only the equal per

16. Diseconomies of scale imply that the per unit cost of providing a service increases at higher levels of output while economies of scale imply the opposite, namely, that per unit costs fall as output increases. The implication is that unit costs of providing particular services may vary across provinces (for the same service) simply because provinces differ in size. If, for example, there are economies of scale in education, smaller provinces will face a (unit) cost disadvantage simply because they have a smaller population. One can argue that such cost disadvantages should be compensable under a capital grant scheme.

17. Petchey, J.D., Shapiro, P., MacDonald, G and P.Koshy (2000). Capital Equalisation and the Australian States. *The Economic Record*. 76:232. 32-44.

capita component of the Model will remain once the historical domestic backlogs have been eliminated. In this sense, the equal per capita allocation is the most important part of the Model, at least in the longer term.

Therefore, some portion of the pool is “top-sliced” and allocated to the historical domestic backlog. The aggregate amount top-sliced is  $CP_t \cdot \delta_t$  where  $0 \leq \delta_t \leq 1$  is a policy parameter. The remaining portion of the pool,  $(1 - \delta_t)$ , is allocated on an equal per capita basis to all provinces. Thus, the aggregate amount remaining in the pool for the equal per capita allocation (following the domestic backlog top-slice) is:

$$\boxed{CP_1(1-\delta_1)} \tag{4}$$

Note that  $\delta$  is a parameter whose value can be chosen by the policy maker. The greater is the value of  $\delta_t$ , the smaller is the allocation to the overall capital deficiency (and the greater is the allocation to reducing the historical domestic backlog). Conversely, the lower is the value of  $\delta_t$ , the smaller is the amount allocated to the historical domestic backlog problem and the greater is the allocation of funds to addressing the overall capital deficiency. From this, one can see that the policy maker has the discretionary power to decide how quickly the domestic backlog is eliminated. Also, once the historical domestic backlogs are eliminated the parameter will be set equal to zero, implying that all of the pool will be allocated on an equal per capita basis.

If the amount given in (4) is allocated to each province on an equal per capita basis as proposed, then a province’s aggregate equal per capita grant in period one is just:

$$\boxed{G_{i,1}^E = CP_1(1-\delta_1) \cdot \left( \frac{P_{i,1}}{P_1} \right)} \tag{5}$$

### 3.3 The Historical Domestic Backlog Grant

The rest of the pool is allocated among those provinces with a positive domestic backlog (as defined above), according to the following formula that automatically ensures that the sum of the domestic backlog grants exhausts the part of the pool allocated to domestic backlogs,

$$\boxed{G_{i,1}^D = \left\{ \begin{array}{ll} \frac{B_{i,1}}{\sum_{i:B_{i,1}>0} B_{i,1}} (\delta_1 \cdot CP_1) & \forall B_{i,1} > 0 \\ 0 & \forall B_{i,1} \leq 0 \end{array} \right\}} \tag{6}$$

where  $G_{i,1}^D$  is the domestic backlog grant to province  $i$  in period one. Only those provinces with a positive domestic backlog receive this grant.

### 3.4 Aggregate Grant

The total grant to province  $i$  is the sum of the equal per capita allocation and any domestic backlog grant that may be received:

$$G_{i,1} = G_{i,1}^E + G_{i,1}^D \cdot \delta_t \quad (7)$$

Provinces with no domestic backlog in period one will receive only an equal per capita allocation. For such Provinces;  $G_{i,1} = G_{i,1}^E$ . Provinces with a positive domestic backlog will receive their equal per capita allocation plus a share of the pool being allocated to the domestic backlogs.

Once the domestic backlogs have been eliminated, all provinces will receive only the equal per capita grant (as noted above,  $\delta_t$  will be set equal to zero once this point is reached). If additional work is undertaken to incorporate capital cost disabilities, as is suggested above, then the equal per capita allocations may also be modified accordingly at some stage in the future. By the time this point is reached, South Africa's system of intergovernmental fiscal relations will have become "normalised" in the sense that the domestic backlogs will have been eliminated.

Therefore, policy makers may wish to set  $\delta_t$  at a relatively high level in the early stages of the scheme, since this implies that most of the pool will go towards eliminating the historical domestic backlogs. In this way national government will meet demands to correct the historical backlogs as quickly as possible. But as the scheme progresses, increasingly more emphasis should be placed on the equal per capita allocation by reducing the value of  $\delta_t$  as the domestic backlogs become less significant. As noted above, at some point  $\delta_t$  will become zero as the domestic backlogs are eliminated, leaving only the equal per capita part of the grant scheme to operate in the longer term.

## 4. Period Two

At the beginning of the second period it is necessary to adjust the domestic capital backlog estimated in period one to take account of the domestic backlog grant made in period one.<sup>18</sup> Thus, the estimate of the domestic backlog for the commencement of period two is

$$B_{i,2} = B_{i,1} - G_{i,1}^D \cdot \delta_t \quad (8)$$

The backlog grant for period two is now based on our estimate of each province's domestic backlog at the start of period two, namely,

18. Unlike the first version of PCGM we have abstracted from depreciation since adding depreciation considerably complicates the Model without have a significant impact on the results.

$$G_{i,2}^D = \left\{ \begin{array}{ll} \frac{B_{i,2}}{\sum_{i:B_{i,2}>0} B_{i,2}} (\delta_2 \cdot CP_2) & \forall B_{i,2} > 0 \\ 0 & \forall B_{i,2} \leq 0 \end{array} \right\} \quad (9)$$

A province with a positive backlog in period one could have a zero or negative backlog in period two depending on the impact of the period one domestic backlog grant. As before, the equal per capita grant is

$$G_{i,2}^E = CP_2 (1 - \delta_2) \cdot \left( \frac{P_{i,2}}{P_2} \right) \quad (10)$$

and the total grant to province i in period two is

$$G_{i,2} = G_{i,2}^E + G_{i,2}^D \quad (11)$$

## 5. Period Three

For period three the scheme proceeds as before, so the following analysis presents the formulas only. The backlog at the beginning of period three is

$$B_{i,3} = B_{i,1} - (G_{i,1}^D + G_{i,2}^D) \quad (12)$$

The domestic backlog grant for period three is

$$G_{i,3}^D = \left\{ \begin{array}{ll} \frac{B_{i,3}}{\sum_{i:B_{i,3}>0} B_{i,3}} (\delta_3 \cdot CP_3) & \forall B_{i,3} > 0 \\ 0 & \forall B_{i,3} \leq 0 \end{array} \right\} \quad (13)$$

The equal per capita grant is

$$G_{i,3}^E = CP_3 (1 - \delta_3) \cdot \left( \frac{P_{i,3}}{P_3} \right) \quad (14)$$

and the total grant to province  $i$  in period three is

$$G_{i,3} = G_{i,3}^E + G_{i,3}^D \cdot \quad (15)$$

Thus, at the end of the three-period projection period, the historically determined domestic capital backlog for province  $i$  is

$$B_{i,3} = B_{i,1} - (G_{i,1}^D + G_{i,2}^D + G_{i,3}^D) \cdot \quad (16)$$

If at the end of the three-period period a province still has a domestic backlog, as measured by (16), then the scheme would require a Phase II. This would be the same as Phase I but would use, as its initial backlog estimates, the number derived from (16).

## 6. The Input Data Base

The following sections deal with the issues associated with the Model's input database. The data inputs for the model are twofold.

- First an estimate of the pool of funds available to the provinces for backlog elimination is required. This is clearly a political as much as an economic decision. The final database allows the user and the stakeholders the maximum flexibility in terms of changing the assumptions about the pool of funds available. However, some forecasts based on what are believed to be reasonable assumptions are provided as a baseline for the model.
- Second, an estimate of the current capital stock by province and the desired capital stock by province is required. The Reserve Bank of South Africa has provided estimates of the capital stock at the provincial government level. These estimates provide a high quality data input for the model. However, the disaggregated data based on two alternative sets of provincial weightings is provided; one based on Treasury figures for capital expenditure flows and the second based on provincial output levels. Again the aim is to provide the user with flexibility and choice in the simulations.

Estimates of the optimal or desired capital stock depend on estimates of population at the province level. These figures have been supplied by Stats SA and again provide a high quality data input for the model. The model simulations also require estimates of the future provincial populations. It is proposed that the forecast equations suggested by Stats SA be used as a basis for these figures.

The sections below draw in part on previous Commission submissions, but are updated, where appropriate, to include new information from Government. They also focus on the data requirements of the model, amended to account for comments made by Commission staff and stakeholders.

## 6.1 Forecasting the Pool

The rapidity with which any capital backlogs can be eliminated in the provinces depends upon the pool of funds available. In the absence of an on-going conditional grant available to provinces over the medium- to long-term, the Commission adopted the following approach in determining a pool of funds for purposes of simulating the model. The pool of funds may also be determined as a Government policy decision.

- The forecasts of the pool of funds available should be based on a proportion of forecast GDP.
- The forecasts of GDP should be based where possible on official Reserve Bank and / or Treasury forecasts for the economy.
- A simple forecasting model of GDP should be provided, but it should be used mainly to provide upper and lower bounds for the forecasts.
- As an alternative the FFC should use Treasury forecasts of capital expenditure and link the pool size to these estimates. The advantage of this is that once again the method is simple and is linked to official sources of data.
- The final programme allows as much flexibility as possible in the pool forecasts to allow the final user to update and construct alternative scenarios.

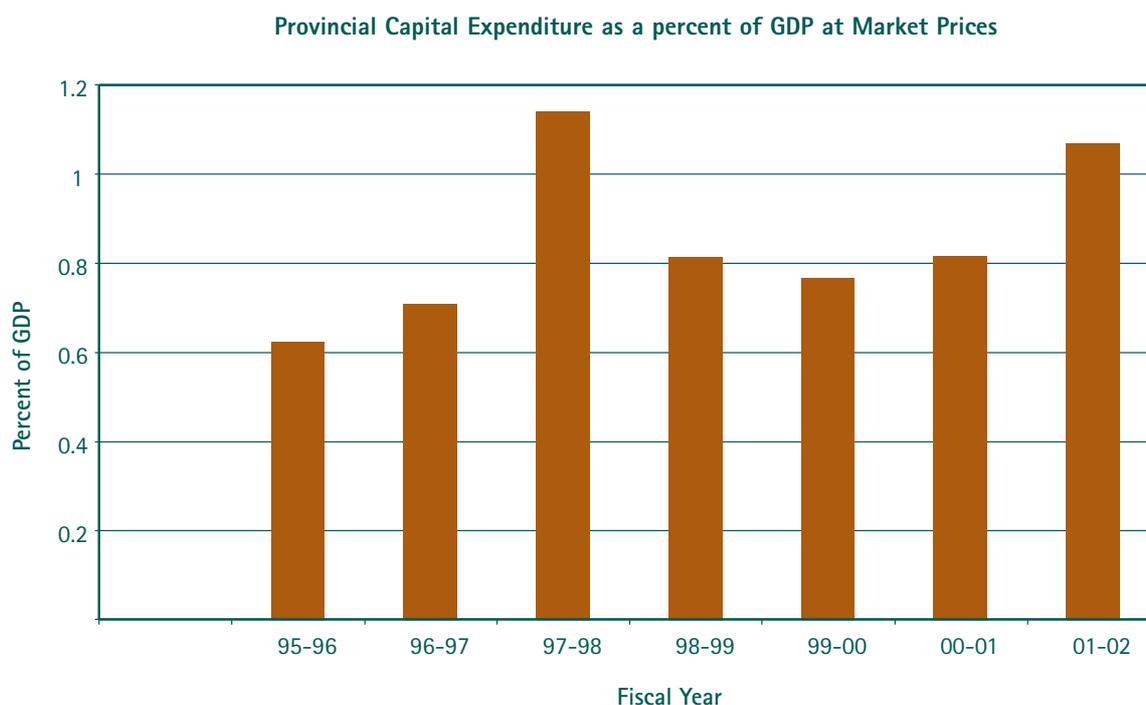
The final version of the database includes a simple forecasting model of Real GDP on which calculation of the size of the pool of funds available can be based. The technical details of the forecast are discussed below and include discussion of the adequacy of such a forecasting model and some estimate of the statistical confidence intervals associated with the forecast. The final database allows the user to base the size of the pool on the forecast of GDP, allowing the user to set the proportion of GDP allocated as a policy choice variable. The database also allows the pool size to be based on a variety of assumptions based on the forecast equation. Any econometric forecast is accompanied by an estimate of the variance of the forecast error. Based on this estimate the database allows the user to select the baseline forecast, an optimistic, very optimistic, pessimistic, and very pessimistic for GDP on which to base the pool size.

As noted earlier, in the final version of the programme allowance is made for the user to over-ride the model forecasts of the pool of funds for purposes of scenario planning. Indeed, it seems to that such flexibility in the programme is essential. It cannot be doubted that whilst these methods can deliver broad estimates of what might feasibly be available, political decisions and other events will have a significant influence on the funds available to address the capital backlogs issue.

The further requirement for this approach is a parameter to represent the proportion of GDP to be made available for the pool. Again, the programming allows for the possibility to vary this parameter but some

reasonable benchmark needs to be established. It is suggested that this be based on current figures on the proportion of capital expenditure at the provincial government level to GDP. Figure 1 below uses data sourced from the Reserve Bank.

Figure 1



The chart shows total provincial capital expenditure as a percentage of GDP in market prices on a fiscal period basis.<sup>19</sup> As can be seen, whilst this ratio shows some degree of volatility, a figure of around zero point nine percent (0.9 percent) of GDP would seem a reasonable place to start. Since the figure shows the total of capital expenditure at the provincial level, the initial belief would be that the pool of funds made available by national government for the elimination of backlogs might be some proportion of this. An initial figure of perhaps fifty percent is suggested, which would imply that the funds available for the pool might be about 0.46 of one percent of GDP. These assumptions are built into the database but may be overridden by the user within the programme.

## 6.2 Forecasting SA GDP to provide an estimate of the pool of funds available for the backlogs model

Clearly given the scope of the exercise, the aim is to attempt to provide baseline figures for GDP and some estimates of upper and lower limits over the three-period horizon in order to provide bounds for the simulation exercises. These forecasts of GDP should and can, within the database, be updated by the user on the basis of further information from sources such as the Reserve Bank or Treasury.

<sup>19</sup> Quarterly GDP data was used to construct annual GDP on a fiscal period basis using the last two quarters of the period plus the first two quarters of the next.

Given the data available, a simple but respectable approach is adopted and GDP is modelled as an autoregressive process. This representation is then used to provide forecasts. Very simply, an autoregressive model assumes that there is sufficient information in the past behaviour of a variable to allow for prediction of future values. Thus current and past values of Real GDP will be used to allow for forecasting into the future. An AR(1) model assumes that the next period's value can be predicted using this period's one. Notation makes this clearer: if  $y_t$  denotes value of  $y$  observed at time  $t$ , then an AR(1) is of the form  $y_t = \alpha y_{t-1} + \xi_t$  where the symbol  $\xi_t$  represents a random (therefore unpredictable) component. In order to make forecasts, some assumptions have to be made about the error component  $\xi_t$ . It is assumed to have a mean of zero, have a constant variance and not serially correlated (i.e.  $\xi_t$  should not be correlated with  $\xi_{t-i}$  for all  $i$  not equal to zero). These assumptions can be tested when the model is estimated. An AR(2) or AR( $n$ ) simply assumes that further lags ( $t-2$ .... $t-n$ ) are useful in explaining the variable in question.

Real (constant 1995 price GDP) quarterly from 1993Q1 to 2002Q3 were used to estimate the model. Initially an AR(6) model was estimated but model reduction tests suggested that an AR(2) was acceptable. Such a finding is not too surprising, as a number of researchers have suggested that low order autoregressions are adequate for capturing the behaviour of GDP in a range of economies. Figure 2 below shows the ability of such a simple model to track the data. The regression was fitted leaving the last 8 quarters available for simple 1 step forecasts, and as can be seen the model does tolerably well showing no sign of parameter instability. The forecasts plotted in Figure 2 do not give a fair feel for what the regression model will be actually asked to do in the database.

These forecasts are based on in-sample data, so for each 1 step ahead actual values for the lagged variables are updated as the forecast moves ahead. Figure 3 uses the estimated model to carry out dynamic forecasts for 8 periods ahead. Now the forecast can clearly be seen drifting off from the actual value towards the end of the period, and the size of the standard error bands for the forecast increase. However, the actual value is always comfortably within the standard error bands. In the database the user is allowed to choose values for the forecast which are based on the mean value plus or minus either one or two standard deviations.<sup>20</sup>

It is therefore important to make it clear what the stakeholders should take from these forecasts. A simple AR model is not going to be able to do the job of a large structural model or a Vector Autoregressive Model. It will provide a simple way of extrapolating the current GDP trends into the future on the basis that no structural change takes place. The lesson that should be taken from this is that the forecasts provided should not be expected to perform well more than 1 period out, and that the model user should test the sensitivity of the simulations to GDP forecasts within the bound suggested by the standard errors of the forecast. Indeed it is perhaps the estimated standard error bands that are the most useful part of the exercise. They provide the user with a feel for just how adequate (or inadequate) the model forecast might be at a period of three periods out and thus hopefully provide a feel for the possible limitations of the exercise.

20. The variance, or its square root the standard error, of a forecast allows us to construct confidence intervals for the forecast. Thus the forecast value plus and minus 2 times the standard error provides a 95% confidence interval for the forecast – such that we can make a statement that we are 95% confident that the true value will fall in the range thus described.

Figure 2: In sample forecast exercise.

The first figure shows the actual and fitted over the estimation sample and forecast period. The second augments this by showing more clearly the forecast values and the  $\pm 2$  standard error bands.

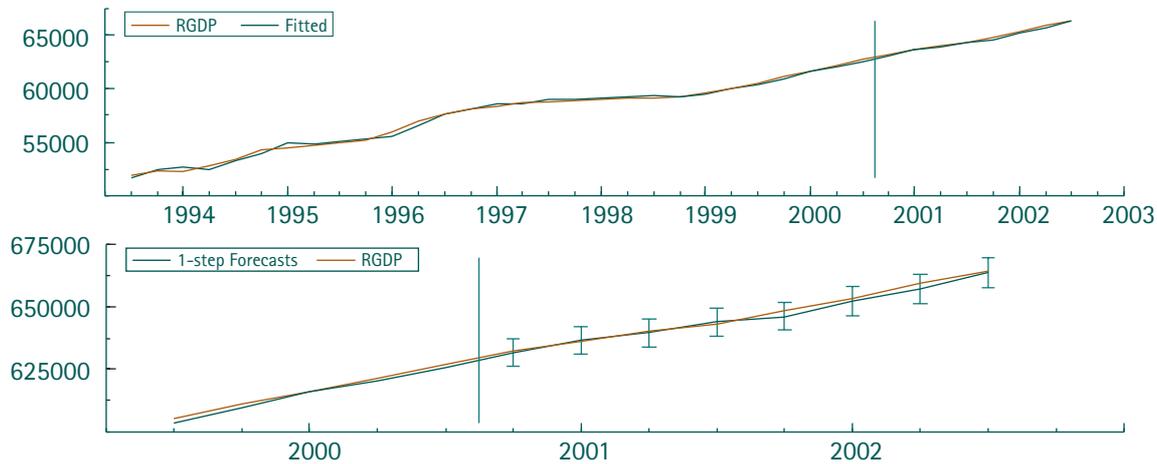
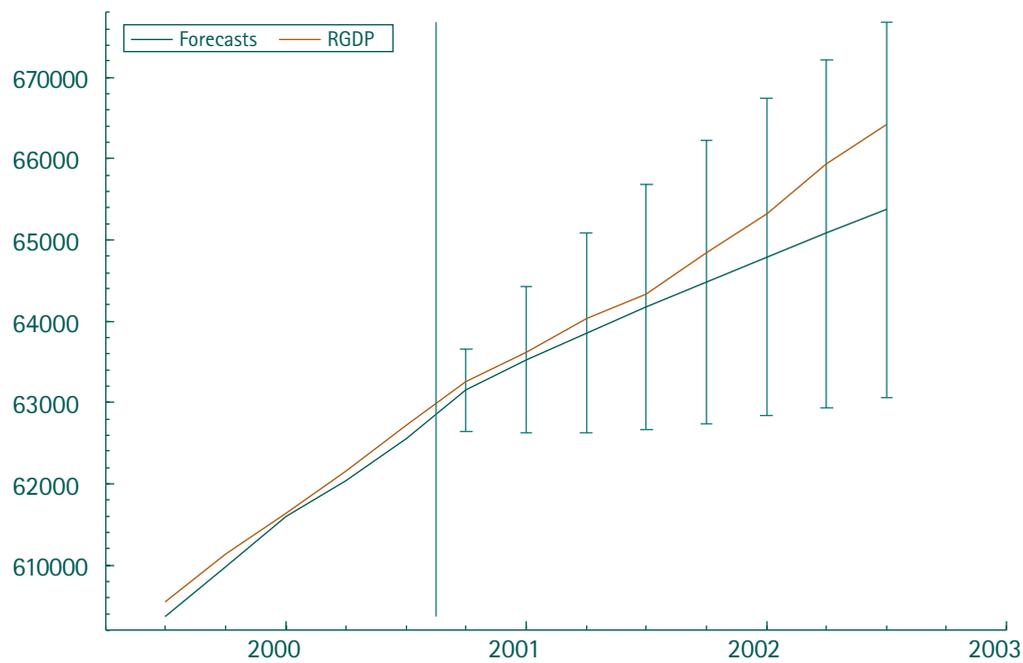


Figure 3: Dynamic forecasts and standard error bars



The forecasting equation adopted is a simple autoregressive model of the form:

$$y_t = \beta_1 y_{t-1} + \beta_2 y_{t-2} + \varepsilon_t \quad (17)$$

Since the data used to estimate this regression model is quarterly and GDP forecasts are needed for three periods, this equation can be used to provide forecasts of  $y_{t+1}, y_{t+2}, \dots, y_{t+12}$ . To do this a method referred to as dynamic forecasting will be used. This is relatively simple to implement and is available as a standard option in most econometric packages. As noted above, one advantage is that econometric packages will provide estimates of the variance of the forecast thus allowing us to calculate 95 percent confidence intervals. Since the database being delivered to the FFC is meant for use on EXCEL, some discussion of the method and how it was implemented in EXCEL is necessary.

The ideas using the simplest form of the autoregressive model, the AR(1), are illustrated:

$$y_t = \beta_1 y_{t-1} + \varepsilon_t \tag{18}$$

The method by which forecasts can be constructed can be simply seen by writing this equation for the subsequent periods and then using backward substitutions

$$\begin{aligned} y_{t+1} &= \beta_1 y_t + \varepsilon_{t+1} \\ y_{t+2} &= \beta_1 y_{t+1} + \varepsilon_{t+2} = \beta_1 (\beta_1 y_t + \varepsilon_{t+1}) + \varepsilon_{t+2} = \beta_1^2 y_t + \beta_1 \varepsilon_{t+1} + \varepsilon_{t+2} \\ &\dots \\ y_{t+h} &= \beta_1^h y_t + \sum_{j=0}^{h-1} \beta_1^j \varepsilon_{t+h-j} \end{aligned} \tag{19}$$

so that the value at t+h will depend on  $y_t$ , the true regression parameter  $\beta_1$  and the statistical error term. In practice estimated parameter  $\hat{\beta}_1$  will be used to construct the forecasts so that the forecast for t+h will be:

$$\hat{y}_{t+h} = \hat{\beta}_1^h y_t \tag{20}$$

This allows us to calculate the forecast error as:

$$\begin{aligned} v_{t+h} &= y_{t+h} - \hat{y}_{t+h} \\ v_{t+h} &= (\beta_1^h - \hat{\beta}_1^h) y_t + \sum_{j=0}^{h-1} \beta_1^j \varepsilon_{t+h-j} \end{aligned} \tag{21}$$

thus the forecasts are made for subsequent periods based on observation  $y_t$  (which is known) and the estimated parameters of the model. This is important as it says that only this quarter's value is needed to allow for calculation of forecasts for the next 12 quarters.

Most model forecasts come with what is referred to as a confidence interval, usually a “95 percent confidence interval”. The interpretation is simple – it suggests that, provided the assumptions made when carrying out ordinary least squares estimation hold, and provided that the parameters of the regression model stay constant over the regression period (a strong assumption which of course will not hold if there is a structural change during the forecast period), then there is 95 percent confidence that the actual value of the variable being forecast will lie in the range specified. In order to calculate this confidence interval, it is necessary to calculate the variance of the forecast error. The forecast error is as noted above:

$$\begin{aligned} v_{t+h} &= y_{t+h} - \hat{y}_{t+h} \\ v_{t+h} &= (\beta_1^h - \hat{\beta}_1^h) y_t + \sum_{j=0}^{h-1} \beta_1^j \varepsilon_{t+h-j} \end{aligned} \quad (22)$$

if parameter uncertainty is ignored, this can be written simply as

$$v_{t+h} = \sum_{j=0}^{h-1} \beta_1^j \varepsilon_{t+h-j} \quad (23)$$

with variance

$$V(v_{t+h}) = \sum_{j=0}^{h-1} \beta_1^j \Omega \beta_1^j \quad (24)$$

under the assumption that the errors are not correlated and where  $\Omega = E(\varepsilon_i \varepsilon_i')$ .

Estimates of the autoregressive parameters and the forecast error variances in the EXCEL package are required in order to implement this model. In the specific case a more general version of the above can be used. Suppose the model takes the form:

$$y_t = \sum_{i=1}^m \beta_i y_{t-i} + \varepsilon_t \quad (25)$$

the basic form of expression (24) above can still be used but the AR model must be written in what is referred to as companion form:

$$\begin{pmatrix} y_t \\ y_{t-1} \\ \cdot \\ y_{t-m+1} \end{pmatrix} = \begin{pmatrix} \beta_1 & \beta_2 & \cdot & \beta_m \\ I & 0 & 0 & 0 \\ 0 & I & 0 & 0 \\ 0 & 0 & I & 0 \end{pmatrix} \begin{pmatrix} y_{t-1} \\ y_{t-2} \\ \cdot \\ y_{t-m} \end{pmatrix} + \begin{pmatrix} \varepsilon_t \\ 0 \\ 0 \\ 0 \end{pmatrix} \quad (26)$$

or more compactly

$$y_t^* = Dy_{t-1}^* + \epsilon_t^* \tag{27}$$

and the variance of the forecast error becomes

$$V(v_{t+h}) = \sum_{j=0}^{h-1} D^j \varpi D^{j'}, \quad \varpi = \begin{pmatrix} \Omega & 0 & \cdot & 0 \\ 0 & 0 & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & 0 \end{pmatrix} \tag{28}$$

whilst this may not look to be the case this in fact simplifies the calculations. In the case of an AR(2) the matrix D becomes

$$\begin{pmatrix} \beta_1 & \beta_2 \\ 1 & 0 \end{pmatrix} \tag{29}$$

and it can be used to calculate the forecasts and the forecast error variances and hence the confidence intervals. All that is needed in order to be able to implement this is the ability to carry out some simple matrix multiplication, which fortunately EXCEL can handle.

To illustrate this further and in particular to illustrate how the method was implemented in EXCEL, take a further example related to the forecasting model actually used. In the AR(2),

$$y_t = \beta_1 y_{t-1} + \beta_2 y_{t-2} + \epsilon_t \tag{30}$$

Consider the two period ahead forecast  $y_{t+2}$

$$\begin{aligned} y_{t+2} &= \beta_1 y_{t+1} + \beta_2 y_t + \epsilon_{t+2} \\ y_{t+2} &= \beta_1 (\beta_1 y_t + \beta_2 y_{t-1} + \epsilon_{t+1}) + \beta_2 y_t + \epsilon_{t+2} \\ y_{t+2} &= (\beta_1^2 y_t + \beta_2 y_t) + \beta_1 \beta_2 y_{t-1} + \beta_1 \epsilon_{t+1} + \epsilon_{t+2} \end{aligned} \tag{31}$$

For the forecast one can use

$$D^2 Y_t^* = \begin{bmatrix} \hat{\beta}_1 & \hat{\beta}_2 \\ 1 & 0 \end{bmatrix} \begin{bmatrix} \hat{\beta}_1 & \hat{\beta}_2 \\ 1 & 0 \end{bmatrix} \begin{bmatrix} y_t \\ y_{t-1} \end{bmatrix} = \begin{bmatrix} \hat{\beta}_1^2 + \hat{\beta}_2 & \hat{\beta}_1 \hat{\beta}_2 \\ \hat{\beta}_1 & \hat{\beta}_2 \end{bmatrix} \begin{bmatrix} y_t \\ y_{t-1} \end{bmatrix} \quad (32)$$

and use the top row to give us

$$(\hat{\beta}_1^2 y_t + \hat{\beta}_2 y_t) + \hat{\beta}_1 \hat{\beta}_2 y_{t-1} \quad (33)$$

which will give the predicted value.

For the error variance one needs  $V(\beta_1 \varepsilon_{t+2} + \varepsilon_{t+2})$  which under the assumption of homoskedastic errors (constant error variance) and that the covariances  $(e_t, e_s)$  are zero is  $\beta_1 \text{var}(e_t) + \text{var}(e_t)$  and can be obtained as

$$V(v_{t+h}) = \sum_{j=0}^{h-1} D^j \omega D^{j'} = \begin{bmatrix} \Omega & 0 \\ 0 & 0 \end{bmatrix} + \begin{bmatrix} \beta_1 & \beta_2 \\ 1 & 0 \end{bmatrix} \begin{bmatrix} \Omega & 0 \\ 0 & 0 \end{bmatrix} \begin{bmatrix} \beta_1 & 1 \\ \beta_2 & 0 \end{bmatrix} \\ = \begin{bmatrix} \Omega & 0 \\ 0 & 0 \end{bmatrix} + \begin{bmatrix} \hat{\beta}_1^2 \Omega & \hat{\beta}_1 \Omega \\ \hat{\beta}_1 \Omega & \Omega \end{bmatrix} \quad (34)$$

by using the top left elements of the two matrices. The EXCEL programme runs the relevant autoregression using the in-built data analysis programme. The relevant matrices are then constructed from the output and the forecast and its variance calculated.

### 6.3 Capital Stocks and the Desired Capital Stock

As noted the programme requires some estimate of the capital stock at the provincial level. Fortunately the Reserve Bank of South Africa has provided the data that can be used to estimate the Provincial Government Fixed Capital Stock at the aggregate South African level.<sup>21</sup> The data is provided in constant 1995 prices with the estimates being period end estimates. The Reserve Bank has also provided the data disaggregated to the provincial level on the basis of weightings based on the underlying capital expenditure flows. As noted earlier, this was one of the methods proposed and of which the Reserve Bank is supportive. The Reserve Bank supplied data for the period 1990–2002. Simple analysis of the data reveals the weightings which they applied and these are in the second column of Table 1.<sup>22</sup>

21. This stock figure is disaggregated into residential buildings, non residential buildings, construction works and machinery and equipment.

22. The weightings were constant over time.

Table 1: Capital Stock Disaggregation to the Provincial Level – weightings

Province	Reserve Bank Weights	Treasury Weights	Output weights
EC	0.0649	0.0652	0.0822
FS	0.0410	0.0579	0.0561
GA	0.2285	0.1828	0.3367
KN	0.2788	0.2856	0.1581
LI	0.0639	0.0882	0.0590
MP	0.0873	0.0859	0.0722
NC	0.0280	0.0279	0.0211
NW	0.0909	0.1020	0.0735
WC	0.1169	0.1046	0.1412

Table 2 Capital Expenditure by Province

Provinces	Actual Capital Expenditure					
	95/96		96/97		97/98	
	R '000's	propn	R '000's	propn	R '000's	propn
EC	131159	0.0361	65507	0.0141	744570.961	0.0978
FS	180275	0.0496	283802.57	0.0613	626584.285	0.0823
GA	560945	0.1544	705000	0.1522	906000	0.1190
KN	1157915	0.3188	1660359	0.3584	2183489.282	0.2868
LI	405890	0.1118	375276	0.0810	479115	0.0629
MP	231426.419	0.0637	443889.378	0.0958	729458.615	0.0958
NC	111206	0.0306	129579	0.0280	206757.824	0.0272
NW	394553.2615	0.1086	547184	0.1181	890275.846	0.1170
WC	458650	0.1263	422470	0.0912	846173.647	0.1112
TOTAL	3632019.681		4633066.948		7612425.46	

The original proposal was to use weightings based on capital expenditure figures provided by the Treasury. The advantage of using Treasury figures was that they also provide Medium Term Provincial Capital Expenditure estimates and it was argued that these estimates might be used as a basis on which to estimate a figure for the potential pool of funds. This argument was based on the assumption that Government might make available a pool of funds that was some percentage of the proposed capital expenditure estimates. It seems worthwhile pursuing this alternative but, to do so, one would need to be confident that Treasury's flow figures are broadly consistent with the implicit flow figures used by the Reserve Bank. Fortunately this appears to be the case. Table 2 below shows Treasury figures on Capital Expenditure for the periods 1995/96 to 2000/01 (in Rand '000's). The column headed "proportion" is the simple ratio of the provinces' capital expenditure that period to the total of capital expenditure.

As can be seen the figures are quite volatile, for example the share allocated to Eastern Cape varies between 1.4 percent and 11.9 percent, that for KwaZulu-Natal between 21.3 percent and 35.8 percent. However the final column, showing averages of these ratios for the 6 periods, are remarkably close to those used by the Reserve Bank (and are reproduced above in Table 1). Finally column 3 of Table 1 shows each province's share in output (the figure is an average of their share of output for the period 1995 to 2001). Once again whilst there are some variations, the figures are broadly consistent.

All three sets of weighting schemes (and a combination) are included in the input database to, once again, maximise options for the user and for simulation purposes.

The presence or absence of a domestic backlogs problem in a particular province will depend on two things. The first is the current capital stock and the second is the desired amount of capital in that province.

98/99		99/00		00/01		Average
R '000's	propn	R '000's	propn	R '000's	propn	
382101	0.0629	283185	0.0615	940306	0.1188	0.0652
421288	0.0694	157274	0.0341	400977	0.0506	0.0579
1541664	0.2540	1181673	0.2564	1271959	0.1607	0.1828
1471733	0.2424	1351056	0.2932	1692029	0.2137	0.2856
435255	0.0717	307253	0.0667	1071052	0.1353	0.0882
480809	0.0792	492833	0.1069	585512	0.0740	0.0859
169723	0.0280	143769	0.0312	175977	0.0222	0.0279
430913	0.0710	418220	0.0908	841900	0.1063	0.1020
737150	0.1214	272932	0.0592	937471	0.1184	0.1046
6070636		4608195		7917183		

Obviously, if the current capital stock is greater than the desired, then in the current period there is no domestic backlog. On the other hand, if the current capital stock is less than the desired, a domestic backlog exists. As the method of estimating the current capital stock in each province has already been discussed, light needs to be shed on how the desired capital stock is to be estimated.

A simple and obvious way to proceed would be to work out the optimal amount of capital per person for SA as a whole and use this to work out what each province should have based on the distribution of the population between the provinces. All that is needed to do this is a measure of the optimal capital per person and figures on provincial populations. The latter are readily available.

The population shares of each province will be vital in determining whether a particular province has a domestic backlog. Intuitively, if a province has a large share of the population but a small share of the capital stock, one might expect this province to have a domestic backlog. This is not, of course, necessarily

so; if the desired amount of capital per worker is relatively small (large), it is possible that each province will have a surplus (domestic backlog). Indeed, in the previous version of the FFC's Provincial Capital Grant Model, the high levels of desired capital meant that all provinces in SA had a substantial backlog. It is, therefore, important that the standard set be sensible and achievable.

Clearly, there are various ways to do this. As noted earlier, using international figures on capital per person might be one way. However, it has been suggested that a South African standard be established initially. Thus it is proposed that the desirable amount of capital per person be set as the average for SA as a whole. This is what has been implemented in the database. The optimal capital stock in each province is calculated using the amount of provincial government capital stock per person in SA as a whole, multiplied by the population of the province in question. If the average capital per person in SA is used as a standard then, a quick feel for the backlogs can be established by simply looking at the provinces' share in the total population and their share of the capital stock. Using this method, it will be a case that the intuition above will be correct - if a province has a larger share of the capital stock than it has of the population, then it will have a domestic capital surplus. If it has a larger share of population than capital stock then it will have a backlog.

As can be seen, these figures imply that only three provinces have a domestic capital backlog, a result which stems largely from the assumption that the desired capital stock is dependant on a SA standard, namely current levels of average provincial capital per person. Obviously using higher standards would raise the backlogs for the current "backlogs provinces" and start to pull in other provinces to the backlogs scenario.

The table makes it clear where domestic backlog problems are going to exist. In rows where the share in the capital stock is greater than the share in population, those provinces are going to be in capital surplus, and those with shares of capital less than population will have backlogs. As can be seen, based on the current numbers the backlogs are only going to be a problem in three of the provinces, namely Eastern Cape, Limpopo, and Free State, with the most severe problem in Eastern Cape, which has almost 16 percent of the population but a capital share of only 6 percent.

## 6.4 Population Forecasts

One of the key inputs to the programme that has resulted, in part, from the move to a domestic backlogs model is a forecast of the SA population, both in total and on a provincial basis. Since capital needs are assessed on a per person basis, it is clear that population growth could have a significant impact on the domestic capital backlogs. Thus, for example, it could be envisaged that high population growth could lead to increasing backlogs if the overall amount of funds allocated to provinces were insufficient.

The source of statistics on the SA population used in the programme is Statistics SA. In particular the current estimate of mid period populations for 2002 comes from *Statistical release P0302 "Mid Period Estimates 2002"*.

Table 3

Provincial Capital Stock (real 1995 prices)	62406	
Total population(000's)	45454.22475	
WC Capital Stock (real 1995 prices)	7295.2614	11.7%
WC population	4321.842777	9.5%
EC Capital Stock (real 1995 prices)	4050.1494	6.5%
EC population	7158.845099	15.7%
NC Capital Stock (real 1995 prices)	1747.368	2.8%
NC population	890.8619388	2.0%
FS Capital Stock (real 1995 prices)	2558.646	4.1%
FS population	2878.996328	6.3%
KZN Capital Stock (real 1995 prices)	17398.7928	27.9%
KZN population	9308.581927	20.5%
NW Capital Stock (real 1995 prices)	5672.7054	9.1%
NW population	3686.049187	8.1%
G Capital Stock (real 1995 prices)	14259.771	22.9%
G population	8170.392331	18.0%
MP Capital Stock (real 1995 prices)	5448.0438	8.7%
MP population	3181.038582	7.0%
LP Capital Stock (real 1995 prices)	3987.7434	6.4%
LP population	5857.61658	12.9%

Statistics SA estimates that by mid-period 2002, the population of South Africa was 45.45 million without taking into account additional deaths due to HIV/AIDS and 45.17 million when such deaths are included. It should of course be noted that these figures are estimates and are based on the 1996 census and assumptions about underlying fertility, mortality, interregional migration, and the impact of the AIDS virus.

Stats SA provides implied exponential growth rates for males and females at the required level of disaggregation (provincial) for the period 1996 to 2002 in Table E of Statistical release P0302. These inferred growth rates include provision for inter-provincial migration and the apparent under-reporting of mortality rates in non-urban regions. Stats SA has also attempted to calculate the growth rates when allowance is made in the figures for additional deaths due to HIV/AIDS. These figures are based on estimates of infection rates from antenatal clinic surveys.

The estimated growth rates are reproduced in Table 4 below. They can be used to produce simple population projections, on the assumption that the implied exponential growth rates are stable using formula (24) from Statistical release P0302:

$$P_{t_2} = P_{t_1} * \exp(r*(t_2-t_1))$$

(35)

Where  $P_{t_2}$  is the population in period 2,  $P_{t_1}$  the population in period  $t_1$  and  $r$  is the inferred growth rate. In all calculations  $P_{t_1}$  is taken to be census night 10<sup>th</sup> October 1996 so  $P_{t_1} = 1996.775$  and mid period populations are estimated, so for example for 2003  $P_{t_2} = 2003.5$ .

Table 4: Growth rates used in model forecast (Source Statistics SA, Statistical release P0302, Table E)

Provinces	Gender	Implied exponential growth rate $r$ , for 1996 to 2002	
		Inc. additional AIDS deaths	Exc. additional AIDS deaths
Western Cape	Males	0.014222	0.014507
	Females	0.015921	0.016272
Eastern Cape	Males	0.023244	0.023857
	Females	0.020179	0.020867
Northern Cape	Males	0.00854	0.008974
	Females	0.010844	0.011379
Free state	Males	0.013986	0.015046
	Females	0.014714	0.016074
KwaZulu-Natal	Males	0.015969	0.017635
	Females	0.015588	0.017543
North West	Males	0.014902	0.015993
	Females	0.015493	0.016884
Gauteng	Males	0.015743	0.016928
	Females	0.01859	0.020166
Mpumalanga	Males	0.020924	0.022137
	Females	0.020832	0.022341
Limpopo	Males	0.032996	0.033383
	Females	0.026924	0.027356

Table 5: Implied Population Growth Rates by Province (%)

		2001/2	2002/3	2003/4	2004/5	2005/6
WC	Inc AIDS	1.5157	1.5203	1.5209	1.5209	1.5210
	Exc AIDS	1.5532	1.5533	1.5534	1.5534	1.5535
EC	Inc AIDS	2.2033	2.1841	2.1845	2.1848	2.1850
	Exc AIDS	2.2508	2.2510	2.2512	2.2515	2.2517
NC	Inc AIDS	0.9906	0.9766	0.9770	0.9771	0.9772
	Exc AIDS	1.0258	1.0259	1.0261	1.0262	1.0264
FS	Inc AIDS	1.4911	1.4460	1.4460	1.4460	1.4460
	Exc AIDS	1.5690	1.5691	1.5691	1.5691	1.5691
KZN	Inc AIDS	1.5618	1.5893	1.5892	1.5892	1.5892
	Exc AIDS	1.7742	1.7742	1.7742	1.7742	1.7742
GT	Inc AIDS	1.7508	1.7297	1.7299	1.7301	1.7303
	Exc AIDS	1.8700	1.8702	1.8705	1.8708	1.8710
MP	Inc AIDS	2.1135	2.1097	2.1096	2.1096	2.1096
	Exc AIDS	2.2491	2.2491	2.2491	2.2491	2.2491
LP	Inc AIDS	3.0471	3.0203	3.0213	3.0222	3.0232
	Exc AIDS	3.0617	3.0627	3.0636	3.0645	3.0655
SA Total	Inc AIDS	1.8975	1.9003	1.9031	1.9059	1.9087
	Exc AIDS	2.008	2.0103	2.0103	2.0153	2.0178

## 6.5 Summary

The refined version of the Provincial Capital Backlogs Model has to some extent simplified the data input needs of the model. The input database is based on official statistics from key sources such as National Treasury, the Reserve Bank of SA, and Stats SA. The high quality of this data and the reputability of its source provide the backlogs model with a sound database from which to build.

## 6.6 Excel Database

This section describes the data in the EXCEL, the uses to which the data are put, and the linkages between the worksheets.

- Capital expenditure flows.** This worksheet has Treasury data on Total Provincial Capital Expenditure in R '000's (current prices). The data in this worksheet is used for two things. Firstly, using the period 95/96 to 00/01, the share of each province in total capital expenditure is calculated. The rationale for this is to use the shares as a method of allocating the total stock of capital to the individual provinces. As noted earlier, one of the reassuring things to come out of this is that these shares are broadly in line with the (implicit) ones provided by the South African Reserve Bank. However it should be noted that the shares have been quite volatile, for example KwaZulu-Natal's share ranged between approximately 21 and 35 percent of the total, Gauteng between 12 and 25 percent, and Western Cape between 6 and 12 percent. It is, of course, this volatility and the small number of data points which make statistical modeling and forecasting of the capital expenditure figures so difficult. As a result, an average of the 6 periods of figures is taken to provide one of the four sets of weights which the user can select to allocate the capital stock. The choice can make a difference to the results of the model. Gauteng's average share for the period is only 18 percent, compared to its SARB weighting of nearly 23 percent and its output-based weighting (discussed below) of 33 percent. Since its share in the population in 2002 was approximately 18 percent, the choice of weights can have a substantial effect. Whichever set of weights one uses, Gauteng has a negative backlog (surplus), but this surplus is much larger if the output weight is used rather than the Treasury weight, which leaves the province very close to its equilibrium stock of capital.

The other use for the Treasury capital expenditure figures is to provide some basis for the calculation of the pool size. Using nominal GDP at market prices and converting the capital expenditure figures to calendar period (using the very simple expedient of assuming that 50 percent of the fiscal period expenditure took place in the last six months of one period and 50 percent in the next period), one can get an estimate of the ratio of Capital Expenditure to GDP. As noted above, the figures range between 0.6 percent and 1.6 percent. An average figure of 0.9 percent is suggested as a baseline. If the allocation to the pool to deal with the backlogs problem were 20 percent of this, then a figure of 0.18 of a percent of GDP would be used as an estimate of the pool size. As noted these figures can only provide basic guidelines for the model user. The actual pool of funds available will undoubtedly be the result of complex economic and political decisions which cannot be modelled here.

- GDP data.** This worksheet simply provides an alternative weighting scheme for the allocation of the capital stock amongst the provinces. The sheet contains data on GDP at market prices (current) for each of the provinces for the period 1995 to 2001. From this one can obtain, for each of the seven periods, each province's share in total output. A weighted average of the seven periods is then taken and used as one of the alternative sets of weights for allocating the capital stock.
- capital stock (real).** This worksheet contains the SARB estimates of provincial capital stocks in constant 1995 prices in Millions of Rand for the period 1990 to 2002. This capital stock is then allocated to each of the provinces using one of five weighting schemes (chosen by the user in the worksheet **input database**). The five weighting schemes used are: SARB weightings (these were calculated from the data supplied by SARB), Treasury (based on Treasury capital expenditure flows),

Output (based on provincial shares in total GDP), and two averaging weightings, one taking an average of all three weights and the second averaging just the SARB and Treasury weights.

- **gdpforecast.** This worksheet carries out the forecasts of GDP based on the AR(2) model. This is technically the most complex worksheet in the database. Having estimated the model parameters in the worksheet **olsforec** this spreadsheet sets up the D matrix and using the estimated regression standard error computes both the forecast and the forecast variances.
- **olsforec.** This spreadsheet, which is linked to **gdpforecast**, described above, uses the EXCEL “data analysis – regression” tool to estimate the required parameters of the AR(2) regression. The parameters of the model and the model standard error are then passed to **gdpforecast**.
- **population.** This worksheet uses the estimated exponential growth rates of provincial populations to forecast provincial populations. The worksheet uses the formula described in this annexure, and forecasts male and female populations at the provincial level in two forms, one including the effects of HIV/AIDS on mortality rates and the other excluding the effects. In the main worksheet (**inputdatabase**), the user has the option of selecting from which forecast (including or excluding the effects of HIV/AIDS) to choose.
- **pool calcn.** This worksheet calculates the estimate of the pool size for the three-period forecast period, which is then passed on to the **inputdatabase**. The spreadsheet allows for a number of choices to be made:

As discussed above, the user can input his/her own values for the pool. This can be done in current prices and the user must input some assumption about inflation rates over the simulation period to allow the program to deflate these to real values. It is also possible for the user to choose to vary the GDP forecast on which the pool size can be based. This is done by using the forecast errors generated in the forecasting section of the programme. The user can choose between the base forecast, an optimistic, very optimistic, pessimistic and a very pessimistic forecast. These options are calculated based on the standard errors of the forecast.<sup>23</sup>

- **inputdatabase.** This key spreadsheet pulls together the elements of the other spreadsheets in terms of the actual numbers that will be required for the simulation model. The spreadsheet indicates, where relevant, the data sources (other parts of the spreadsheet used) and assumptions made.

## 7. Simulations

The model database **inputdb.xls** is now linked with the simulation model, **FFC1a.xls**, which carries out the backlog calculations in the way described by the model equations. A full discussion of the contents of the

23. Optimistic is baseline forecast plus 1 standard error, very optimistic is baseline plus 2 standard error, the pessimistic and very pessimistic are minus 1 and 2 standard errors respectively.

model and the options available has been provided in the document, “Manual for the Provincial Capital Grant Model” (available to Government and stakeholders on request).

## 8. Conclusion

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The Provincial Capital Grant Model achieves the twin goals of eliminating historical domestic backlogs and raising the overall provision of infrastructure for the constitutionally mandated services of education, health, transport, welfare, and housing. To achieve this, the Model’s formulas have two components. The first is an equal per capita component that deals with the overall deficiency of public capital in all provinces. This part of the grant has a predominately economic rationale: to raise the rate of economic growth in the future. The second part is a domestic backlog component and is intended to operate only in the shorter term. By raising the relative amount of capital formation in the relatively poor provinces, this component seeks to correct the inequities resulting from past policies by eliminating domestic backlogs.

## GLOSSARY

### **Constitutionally Mandated Basic Services**

South Africans have the right of access to certain services, as outlined in the Bill of Rights (Chapter 2) of the Constitution. Examples of such constitutionally mandated basic services are basic education and health care services.

### **Cost Disability Factors**

Differences in the unit cost of providing public services for reasons beyond the control of the service provider

### **Distortions**

Economic activity that causes unintended outcomes or influences people's behaviour negatively. For example, if municipality A charges much higher tax rates than municipality B, businesses may move to municipality B owing to the lighter tax burden there.

### **Equalisation (fiscal)**

The process of ensuring that all subnational governments have the capacity to deliver services at comparable tax rates

### **Equalisation (as applied to property rates)**

The method that is used to make blanket adjustments to the appraised values of properties in order to take account of the consistent under- or over-valuing of properties by municipalities

### **Errors of Inclusion**

Where persons receiving government benefits and subsidies are not eligible for them

### **Errors of Exclusion**

Where persons eligible for government benefits or subsidies do not receive them

### **Externalities**

An activity of one entity that affects the welfare of another entity in a way that is outside the market

### **Fiscal Effort**

The ratio of revenue collections to revenue capacity

### **Fully Fungible**

Substitutable: capable of being interchanged. This applies to revenue that, regardless of its original source, can be spent on any activity or programme.

### **Means Testing**

A formal assessment of whether an applicant is eligible to receive government benefits or subsidies

### **MTEF Cycle**

The Medium Term Expenditure Framework is a three-year spending plan of national and provincial governments published at the time of the budget.

### **Out of Age Learners**

Learners falling outside the qualifying school age group, for example, a 20-year-old student who is in Grade 11.

**Proxy Measures**

Also called a substitute or intermediate measure. For example, due to a lack of appropriate data, it may be difficult to measure municipal revenue, and thus a proxy such as gross geographic product could be used as a measure.

**Public Goods**

Goods that are a) not rival in consumption, that is, the fact that one person benefits from such goods does not prevent another person from benefiting simultaneously; and b) not excludable, that is, it is difficult to exclude people from using that good. Examples of public goods are roads and national security.

**Regressive**

A tax system is regressive if the proportion of income paid in tax decreases as income increases.

**Scale Parameter**

A mathematical linear scale with a range of numbers

**Vertical Fiscal Imbalance**

The mismatch between revenue-raising and expenditure responsibilities between levels, tiers, or spheres of government





