Developing a Social Budget for South Africa

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Initial Development of a Social Budget for South Africa[1]

A Social Budget in the sense considered in this paper is a technique for analysing Social Policy developed by the ILO over the past two decades. It consists of a statistical framework for presenting data series on social policy schemes and tools for projecting these series allowing for alternative demographic, economic, and policy assumptions. This paper describes an attempt to develop a Social Budget for the South African Department of Social Development. The South African Social Budget will be innovative in several ways; it will be fully integrated with existing statistical systems such as the National Accounts, it will are include a fuller coverage of the private sector than some previous exercises, and the projection tool used will incorporate microsimulation techniques that permit the examination of the distributional effects of demographic, economic, and policy assumptions as well as their cost.

The paper consists of the following sections; first a brief history of social budgeting and a general description of the technique, second more detail emphasising the unique features of this application in South Africa, and finally a consideration of the feasibility and usefulness of each of our innovations in the light of experience to date.

Introduction to Social Budgeting[2]

Social Budgeting in the sense it is used here has its roots in the debates around reserves versus pay as you go financing of the US Social Security system at the time of its creation in the 1930, in particular the papers by the actuarial consultant to the Social Security Board, W. R. Williamson such as *Social Budgeting*[3]and *Budgeting for Social Security*[4]. As the debate continued, the term "Social Budgeting" became separated from Williamson's original use of it to denote a specific policy of universal flat-rate benefits, and attached to the analytical framework he developed to demonstrate that policy's affordability and to the principal that budget projections should accompany any major social protection reform proposals. However the tradition of regular and routine social budgets only became established with the creation of the German Ministry of Labour and Social Affairs' "Sozialbudget"[5]after the war. It was this German example that the ILOs Financial, Actuarial and Statistical service turned to when faced with the challenge of facilitating the transition from centrally planned to market economies in Central and Eastern Europe in the 1990s. This resulted in ILO sponsored social budgeting exercises in; Slovakia (1994-1995), Ukraine: (1997 – 2001), Panama: (1997 – 1998), Poland: (1998 – 2001) and Bulgaria (1999 – 2000). In 2000 these experiences and the techniques of Social Budgeting were summarised in a volume by Scholz, Cichon and Hagemeyer. The past decade saw studies in Lithuania and Luxembourg and the extension of social budgeting to Africa to accompany the Social Protection Expenditure and Performance Reviews of Zambia (2008) and Tanzania (2008).

The importance of social benefits in post-apartheid South Africa is almost impossible to overstate. Following the 1994 elections, the Government committed itself to a number of specific goals in the area of social policy, including:

[1] The comments expressed in this paper are entirely the responsibility of the author and cannot be taken as representing the views of the Department of Social Development or Oxford Policy Management

[2] This section of the paper draws heavily on material prepared for the project by Krysztof Hagemeyer of the ILO

[3]proceedings of the Casualty Actuarial Society Vol. XXIV 1937/1938

[4]Journal of Gerontology, 1946

[5]http://www.bmas.de/portal/46634/sozialbudget__2009.html

- The elimination of poverty and the establishment of a reasonable, and widely acceptable, distribution of income;
- The provision of a reasonable income in old age;
- The provision of affordable, decent and effective health care for all; and
- Full employment, or if this proves not possible, an adequate mechanism to deal with poverty.

These goals are reflected in section 27 (1)(c) of the constitution which stresses rights of access to social security and social assistance As of March 2011, 14.9 million South Africans were in receipt of social grants (National Treasury 2011) out of a total estimated population of 50.59 million (Stats SA 2011). Expenditure for 2010/11 was estimated at ZAR 88 billion for transfers and ZAR 5.6 billion for administration of grants, together totalling 3.5% of GDP. In 2011/12, the old age and disability grants amount to ZAR 1,140 per month. This compares to legislated minimum wages for domestic workers in metropolitan areas of ZAR 1,506 per month and ZAR 1,256 in non-metropolitan areas. For 2010, Leibbrandt and Woolard (2010) calculated the value of the old age (and disability) grant as 1.75 times the median monthly per capita income as captured in the National Income Dynamics Study (NIDS) 2008 (adjusted for inflation). In 2010, the child support grant equalled 40% of median monthly per capita income and the foster care grant 115% of median monthly per capita income (Leibbrandt and Woolard 2010).

Unsurprisingly the Social Benefit system features prominently in political debates and has been the subject of intensive analysis. In particular the Taylor committee which reported in 2002 conducted a wide ranging review of the system as part of which it drew up Budget tables which have a remarkable resemblance to those drawn up by Williamson in the 30s and 40s (see tables below)

Table 1.1 South African Social Security Expenditure 1998/99 (R billion- ILO 2002)

Expenditure		
Retirement and disability		72.7
Private (individual & occupational)	50.2	
Civil service occupational	5.8	
Old age and disability grant	12.4	
Other	4.4	
Unemployment, employment injury, road accidents		5.9
Healthcare spending		51.2
Family benefits		2.3
Other (including social assistance & housing)		15.7
TOTAL		**147.8**
Revenue		
Funding		
Public		58.4
General revenues	52.5	
Dedicated levies	5.9	
Private		89.4
TOTAL		**147.8**
Percentage of GDP		22.6%

Source: Taylor Committee, 2002

Table 1.2 Total expenditure within the South African social security system 2001 (R billion)

	Total	Contributory				Non-contributory			
Contingency		Voluntary		Mandatory		Means tested		Universal	
		Not regulated	Regulated	Social insurance	National insurance	Social transfers	In-kind	Social transfers	In-kind
Education	52.8								52.8
Health	68.5	0.7	35	0.3	0.5		32		
Housing	5.2								5.2
Retirement	62.5	50.2				12.3			
Disability	14	8.7		0.3	0.8	4.2			
Children	6.4					6.4			
Adult poverty	0								
Unemployed	32.4	29.8		2.6					
Survivors	28.8	27.9		0.1	0.8				
Total	270.6	117.3	35	3.3	2.1	22.9	32	0	58

Source: Taylor Committee, 2002

It was against this background that the department of Social Development (DSD) decided in 2008, partly on the advice of the ILO,to appoint a consortium to construct a full social budget. However the terms of reference for this consortium put forward a number of novel requirements. For example it stated that.

- "A social budget should not be a one-off exercise. It needs to become an ongoing support to Government policy-making and, thus, needs a respective statistical reporting structure permanently implemented."
- "Key sectors that could be addressed typically have both a significant public and private component"

By the time a consortium had been contracted in early 2011 these specifications had been supplemented, partly at out suggestion, by a requirement to integrate the distributive impacts of policy.

What is a Social Budget?

Social budgeting has two main parts; a Social Accounting System (SAS), or database that classifies and enumerates social expenditure and a model projecting social expenditure into the future. The SAS component of the social budgeting process defines the basic table structure for the statistical presentation of the financial flows of all social benefit programmes, as well as presentation of the projection results.

ILO materials give no hard and fast guidelines for formats and classification systems beyond suggesting that classifications must be meaningful consistent and robust. However they also suggest that;

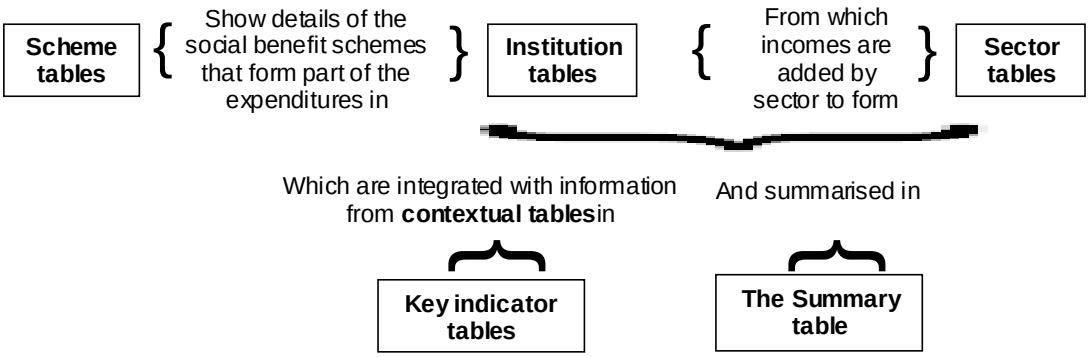
- revenue classifications should cover both legal classification and sources and expenditure classifications should be classified by economic category and function and
- links should be made with other statistical systems such as the SNA and the European System of Social Protection Statistics (ESSPROS).

It is also possible to draw common themes from the many practical examples presented. These suggest a Social Accounting System with the following features;

- **Social Benefit Scheme tables**: These contain one line showing total annual expenditure for each social benefit "scheme" where a scheme is defined as "a distinct body of rules, …..governing the provision of social benefits" The definition is due to the ESSPROS manual which also suggests that as far as possible each scheme should have a single function or purpose. The manual also suggests the following additional ways of categorising schemes
  - Decision-making control ie is the scheme; central government, provincial or local government, a non-government scheme for employees (contractual and non-contractual), or an other non-government scheme
  - Legal enforcementie is it; Compulsory, Voluntary but available by law, or "other"
  - Contributory or non-contributory scheme
  - Level of protection i.e. just a basic safety net or more extensive
  - Scope i.e. the whole population, the economically active, or special groups such as public servants, the self-employed, or specific occupations.
- **Institution tables**that show the incomes and expenditures of each of the institutions that administer these schemes. Note that one institution may administer several schemes
- **Sector tables**which show the origin of funds for the main areas of social expenditure. In the case of health, where financing is most complicated, these may be supplemented by tables showing health expenditure by financing agent, as well as by funding source[6].
- **Contextual tables** whichshow key demographic, employment, and economic information and also government revenues and expenditures for comparison.
- A **Social Budget Summary table** whichshows total social expenditures and receipts in current prices and provides comparisons with other macroeconomic and demographic variables.
- **Key indicator tables** whichdraw on the information presented in the other tables to derive particular indicators needed for policy purposes.

The diagram bellows explains the relations between the different sorts of tables.

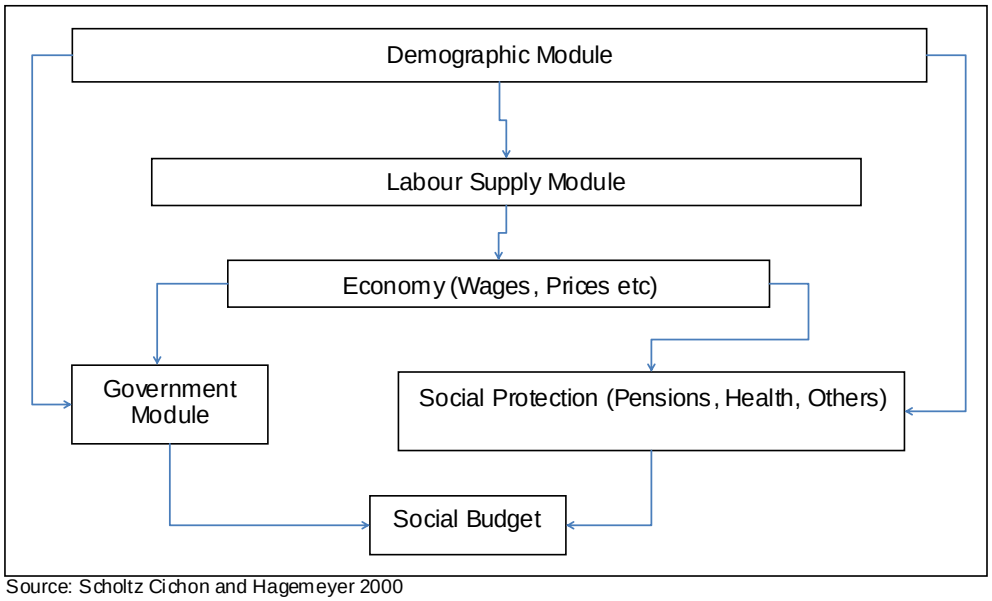
Figure 1.1 Relationships between Social Budget tables



[6] The two are different. For example a medical scheme can act as the financing agent for health expenditure but the ultimate funding source is the various contributors to the scheme.

The ILO's Social Budget documents (Scholz *et al.,* 2000) gives three examples for the forecasting process: the classical budgeting approach (involving experts' projections for each type of revenue and expenditure); a microsimulation approach (forecasting the trajectory of individuals into the future using a dynamic microsimulation model, and their recommended version which they refer to as a modular system approach that involves simulation, but at a macro rather than micro level. The diagram below shows their recommended structure

Figure 1.2 Recommended Structure for Social Budget Model



Source: Scholtz Cichon and Hagemeyer 2000

Broadly they propose self-contained sub-models with one way flows of causality from demographic change to the labour supply, Social Protection, and other government activities, from the labour supply to the economy, and from the economy to social protection and other government. Naturally each module, apart from the final social budget, also uses exogenous variables from outside the system. Less detail is provided on exactly how each module should work but judging from their prototype they would favour simple transparent parameterisation over complex functional forms and econometric estimation.

The South African Social Budget

The South African Social Accounting System

The South African Social Accounting System will cover fifty two separate schemes which are administered by ten different institutions. Three of these "institutions" are groups of private sector organisations, "pension and provident funds", medical societies, and friendly societies, two are general government ministries that provide individual health and education services, and the rest are general government bodies with the specific purpose of administering social benefit schemes. The schemes will be classified according to the COGOG functional classifications for Social used by Statistics South Africa in their GFS statistics system and the additional ESSPROSS categorisation systems described above. Names of the individual schemes and institutions are shown in the table below.

Table 1.3 Schemes and Institutions covered in the South African Social Budget

South African Social Security Administration	**Compensation Commission for Occupational Diseases (CCOD)**	**Friendly Societies**
Old-age grant	Pension for pneumoconiosis & tuberculosis	Health
War veterans' grant	Pension for dependants	Death
Permanent disability grant	Lump Sums for pneumoconiosis & tuberculosis	Funeral
Temporary disability grant	Lump Sums for disability	Other
Foster care grant	Lump Sums for dependants	**Private Pensions**
Care dependency grant	**Compensation Commission**	Pensions
Child support grant	Permanent disability	Lump Sum Retirement/Death
Grant-in-aid	Temporary disability	Lump Sum Resignation/Termination
Social relief of distress	Outstanding claims	Lump Sum Other
Road Accident Fund	Medical claims	**Private Medical Schemes**
General damages	Third-party recoveries	Outpatients
Loss of earnings	**Government Individual Education Services**	Ambulance
Loss of support	Pre-primary and primary	Inpatients
Medical compensation	Secondary	Medical products
Claimants' legal costs	Post-2nd & non-3ry (e.g. ABET)	
RAF's legal costs	Tertiary	
Unemployment Insurance Fund	Subsidiary Services to education	
Unemployment	**Government Individual Health Services**	
Illness	Outpatient Services	
Maternity	Ambulance	
Adoption	Hospital services	
Dependants	Medical products, appliances, equipment	

The system will also closely following ESSPROS classifications for the legal classification of revenue and economic categories of expenditure in our institution tables. The only addition will be a line for tax deductions to allow for contributions to private pensions and medical schemes that actually represent a cost to the Treasury rather than the team member Table 1.4 below lays out this format and also shows the areas where information approximating to the required concepts appears in publicly available documents.

The question of whether it is possible to construct a "respective statistical reporting structure permanently implemented" to support the compilation of such tables requires an examination of the statistical systems already operating in South Africa. Table 1.5 shows a presentation of the quarterly sector accounts produced by the South African Reserve Bank.

Table 1.4 illustrative institutional tables (R million)

	Comp Comission	Comp-ensation Fund	Friendly Societies	Private Pensions	RAF	SASSA	UIF	Med Schemes	Govt Health	Govt Educ
Year	**2010**	**2008**	**2002**	**2006**	**2010**	**2010**	**2010**	**2009**	**2009**	**2009**
Source	Annual Financial Statement	Annual Report	Registrar's Annual Report	Registrar's Annual Report	Annual Report	Annual Report	Commissioner's Report	Council for MS Annual Report	GFS	GFS
INCOME										
Employer social contributions	✓	✓	✓				✓			
Employee/member soc. contrib.			✓	✓				✓		
Earmarked taxes					✓					
Tax Deductions**				✓				✓		
General government revenue	✓				✓	✓			✓	✓
Transfers from other schemes				✓						
Other	✓	✓	✓	✓ *	✓	✓	✓	✓		
TOTAL										
EXPENDITURE										
Social Benefits	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Sicknes							✓			
Disability	✓	✓				✓				
Old Age				✓		✓				
Survivors' benefits			✓				✓			
Family and child benefits						✓	✓			
Unemployment				✓			✓			
Housing benefits										
Social exclusion n.e.c.		✓	✓	✓	✓	✓				
Health Services		✓			✓			✓	✓	
Education Services										✓
Administration costs	N/A	✓	✓	✓	✓	✓	✓	✓	✓	✓
Transfers to other schemes			✓	✓						
Other expenditure			✓			✓	✓			

* Mostly investment earnings ** Source SARS. Tax deductions are removed from employee/member contributions

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Table 1.5 Production, distribution and accumulation accounts for 2009with a mapping to ESSPROSS categories (R million estimates from the SARB website)

NA Codes	SARB Names	ESSPROS Categories	Financial Corporations	Non Fin Corp	General Government	Households & Non Profits	Rest of World
	Individual Social Protection Institutions and Sub Sectors required for the Social Accounting Tables	N. B. some lines have multiple categories	Private short-term insurers Private long term insurers Public short-term insurers Public long term insurers Medical schemes Public Pension & Prov Funds Private Pension & Prov Funds Other Financial		National Education National Health National Other Prov & Local Educ Prov & Local Health Prov & Local Other CCODCF, Comp. Fund, SASA, RAF UIF	Friendly Societies Other	
	Receipts (inflows)						
B.11	External balance of goods and services						**21,116**
P.1	Output at basic prices	N/A	327,336	3,266,512	665,870	743,294	
D.1	Compensation of employees	N/A				1,081,403	9,516
D.62	Social benefits received	N/A				192,221	
D.61	Social contributions received [1]	Social Contributions	160,380		14,656		
D.21	Taxes on products	Earmarked Taxes & N/A			232,731		
D.29	Other taxes on production	Earmarked Taxes & N/A			42,038		
D.5	Current taxes on income and wealth	Earmarked Taxes & N/A			387,634		
D.73	Transfers within government (not shown)	General Revenue					
D.75	Miscellaneous current transfers received [2]	General Revenue , Transfers, Other & N/A			**3,155**	**37,538**	**5,590**
D.9	Capital transfers, receivable [3]	General Revenue , Transfers, Other & N/A		12,534	15,119	11,134	120
D.44	Property income att to insurance policy holders	Transfer		**2,524**		**142,483**	
D.72	Non-life insurance claims [4]	Transfer	-121,144	26,143		95,001	
D.8	Change in net equity of hh in Pens Fund reserves	Transfer				69,993	
D.74	Current international co-operation [5]	Other & N/A			1,342		27,172
D.41	Interest	Other & N/A	333,206	86,550	16,878	79,683	25,869
D.42	Dividends	Other & N/A	60,720	11,557	748	94,671	52,208
D.45	Rent received	Other & N/A		209	1,154	123	

NA Codes	SARB Names	ESSPROS Categories	Financial Corporations	Non Fin Corp	General Government	Households & Non Profits	Rest of World
	Expenditures (Outflows)						
D.5	Current taxes on income and wealth	N/A	27,028	144,483		216,123	
D.61	Social contributions paid [1]	N/A		10,992		164,044	
D.62	Social benefits paid	Benefits	90,387		101,834		
P.31	Individual consumption expenditure [6]	Benefits and N/A			152,511	1,456,089	
D.75	Miscellaneous current transfers paid [2]	Benefits, transfers & N/A	887	3,144	26,219	7,041	8,992
D.9	Capital transfers, payable (change sign)	Benefits, transfers, other & N/A		43	38,451	77	336
D.1	Compensation of employees [7]	Admin & N/A	**91,388**	**563,026**	**312,701**	**116,618**	**7,186**
P.2	Intermediate consumption	Admin & N/A	135,879	2,081,751	299,161	309,622	
D.2	Taxes on production	Admin & N/A	3,382	19,676	4,024	14,956	
D.3	Less Subsidies on production (Change sign)	Admin & N/A	-113	-7,365	-851	-1,861	
D.44	Property income attributed to ins policy holders	Transfer	145,007				
D.71	Net non-life insurance premiums [4]	Transfer	-121,144	26,143		95,001	
D.8	Change in net equity of hh in Pens Fund reserves	Transfer	69,993				
D.74	Current international co-operation [5]	Other, transfer, & N/A			27,172		1,342
D.41	Interest paid	Other, & N/A	210,521	109,466	85,909	122,919	13,371
D.42	Dividends	Other, & N/A	27,397	178,989			13,518
D.45	Rent paid	Other, & N/A		690		796	
P.51	Gross fixed capital formation	Other, & N/A	12,762	369,479	88,203	61,513	
P.52	Change in inventories	Other, & N/A		-59,104	267	-3,232	
D.31	Subsidies on products	N/A			13,361		
D.39	Other subsidies on production	N/A			10,190		
P.32	Collective consumption expenditure	N/A			352,958		
N/A	Less: Residual	N/A	-1,519	-9,399		-3,443	
	Balance (& addendum)						
B.9	Net lending (+)/net borrowing (-)		68,643	-25,985	-130,785	-8,719	96,846
K.1	Consumption of fixed capital	Admin & N/A	8,060	234,864	47,574	42,879	

N.B N/A refers to flows that are not part of the social budget because they do not occur inside an institution managing a social budget scheme.

Table 1.5 also contains a mapping between the sector and transaction codes for the published National Accounts and the institutional, legal and economic categories of our social budgets. The mapping shows one to many classifications in the following areas.

- The institutions operating social benefit schemes are subsumed within the Financial corporation, General Government and Household & non-profit sectors.
- Social contributions received from employers and those received from beneficiaries are shown together (although payments are split)
- Earmarked taxes received are not shown separately (though the petrol levy earmarked for the road accident fund is the only known earmarked tax)
- Social Benefits paid are not split by COFOG functional categories
- Individual consumption expenditure on health and educational services is not identified separately.
- Miscellaneous current transfers received and capital transfers received by the institutions operating social benefit schemes and by Health and Education NPISHs are not identified by origin and so cannot be split into the ESSPROS categories, transfers from Government general revenue, transfers from other schemes, membership dues and subscriptions received from households, and "other" receipts.
- Miscellaneous current transfers paid and capital transfers paid by the institutions operating social benefit schemes are not split into transfers to other schemes and other miscellaneous transfers.

Also some miscellaneous current transfers and capital transfers received/paid are consolidated within the national accounts and do not appear in the tables (eg D.73, transfers within government). Although the Social Budget literature is not specific, the ESSPROS manual recommends that transactions are shown unconsolidated and gross as opposed to net (and also that estimates are recorded on an accrual basis like the National Accounts rather than a cash basis)

Clearly the production and distribution accounts form a very good basis on which to begin to construct a Social Accounting System. In an ideal world the Reserve Bank would be able to provide everything needed from series and data the Bank's Statisticians maintain for their own internal production systems and to the extent that this is possible it would be by far the best option to pursue. However they are far from being the only relevant statistical system in South Africa. Taking each of the difficulties identified above in turn.

- The separating operating social benefit schemes can be considered sector by sector:
  - **General Government** is covered at the level of individual institutions bothin Stats South Africa's Government Finance Statistics System and the workbooks used by the National Treasury for expenditure control. Both of these systems, like the Reserve Bank,take national and provincial department data from the Vulindlela database run by the South African State Information Technology Agency and supplement it with data from the municipalities etc.. Small differences in methodologies and processing treatments mean that the results will not match exactly. Some methodological differences, eg Stats cash/accrual adjustment can be easily unwound but it will never be possible to get an exact match.
  - **Household & non-profits** can, if necessary, be simplified by leaving out Friendly Societies as our work to date shows that these are very small in comparison to the other organisations.

- **Financial Corporations**. Both medical schemes and pension and provident funds appear as separate sub-sectors within the Reserve Bank's classification system and the Bank run's regular surveys of the latter so it appears likely that they will be able to supply information on them. If not we will have to make further investigations of the records of the council for medical schemes and the registrar of pension funds. Worryingly the last issue of the latter available to us is from 2006.

- Splitting Social contributions received using information from the payments side appears entirely plausible as does the identification of earmarked taxes with the Road Accident fund levy.
- If COFOG functional classifications are not split by the Reserve Bank we can obtain estimates for general government from the Stats SA GFS functional classifications. Even more detail going down to individual scheme level is available from the National Treasury workbooks. However similar details on Medical Schemes and pension and provident funds will only be available from their own records
- General government's Individual consumption expenditure on health and educational services appears in Stats SA's GFS publications. Any information required on household out of pocket expenses can only come from the surveys that we are already analysing for our model (see below). That leaves the educational and health services of other institutions such as Corporations and Non Profit institutions serving households that are directly transferred to households. Obtaining information on these directly will be difficult but it may be possible to obtain estimates of the total volume of individual health and education services produced and derive these as residuals[7].
- Dealing with miscellaneous current transfers and capital transfers is likely to be one of the trickiest issues we face methodologically. However these difficulties are likely to be solvable in practise as most of the transactions we are concerned with occur within general government where it will be possible to examine cash transactions to obtain estimates of grossed unconsolidated figures.

The South African Social Budget Model – overall approach

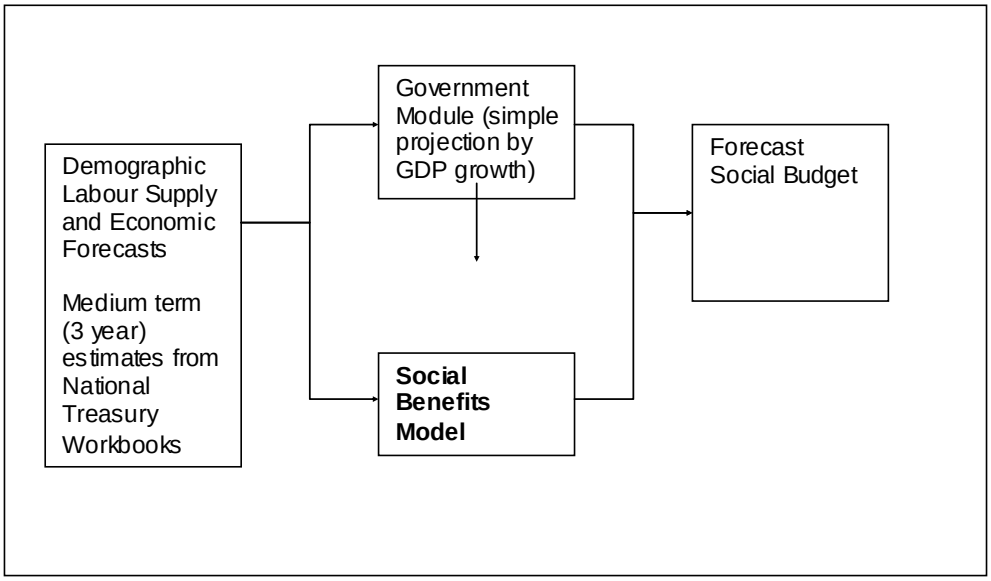
The social budget model will follow many of the elements of the modular approach recommended by the ILO but will also be heavily influenced by the institutional framework in which we are operating. Demography, Labour supply modelling and Macroeconomic forecasting all fall outside the core competence of the DSD but within the acknowledged competence of other departments and expert groups in the South Africa. Furthermore the modular approach specifically excludes backward causal links to these areas from Social Policy. These modules will therefore be replaced with forecasts that are either generally available or that have been commissioned from acknowledged experts. The effect should be to;

- make the model more transparent and easier to operate and maintain.
- Reduce the need for detailed explanation of forecasting methodologies.

Figure 1.3 shows the high level structure of the model.

[7] This procedure will also help in the completion of sector accounts showing the total funding of Social Benefits, health, and education from all sectors.

Figure 1.3 Proposed Structure of South African Social budget model



In accordance with this strategy the Actuarial Society of South Africa (ASSA) have been commissioned to provide demographic forecasts to 2040 under five alternative scenarios covering a range of economic and medical assumptions. The scenarios they provided are shown below.

Table 1.6 Demographic Scenarios examined by ASSA

	1	2	3	4	5
	Rapid development	**Improvement rates of 2010 continue (best estimate)**	**Slowing development**	**Negative development**	**Improvement rates of 2010 continue& migration shock**
Fertility Rates	decrease is **raised** by 1% at every age *		decrease is **lowered by** 1% at every age	remain at 2010 levels	
Net migration	increases from 2010 levels at 2.5% .p.a		decreases logistically from 2010 levels	post 2010 levels from old ASSA 2008	increases from 2010 levels at 2.5% p.a
ART interven-tions	phased in quicker		remain at 2010 levels	remain at 2010 levels	
Median Survival for HIV+	increased		decreased to default ASSA 2008 levels	post 2010 levels from old ASSA 2008	

* i.e. fertility falls even faster

These have been supplemented by labour supply projections that assume constant participation ratios within each age band and demographic group. Although long run economic forecasts we have not yet been commissioned discussions with macroeconomists indicate a strong preference for the simplest approaches. This is in line with the ILO's own work which uses simple projection of GDP which, together with an assumption of constant or constantly changing productivity, fixes labour demand which can be compared with the labour supply to give unemployment.

The South African Social Budget Model – Social Benefits modelling

The model will model future social benefits under various policy scenarios using the South African Microsimulation Model (SAMOD), a static[8] tax and benefit microsimulation model originally developed for the DSD by the Centre for Analysis of South African Social Policy. The model is a South African application of a EUROMOD type model developed by the Institute for Social and Economic Research at the university of Essex. The main elements of this model are,

- A set of text files each containing relevant variables for approximately 100,000 representative individuals and weights for aggregating them to produce national estimates.
- An Excel/Visual Basic Workbook that facilitates the coding of policy rules for creating new variables (eg tax liabilities or benefit entitlements) for each of those individuals and running them. The model is currently set up with the policy systems (i.e. tax and benefit rules) relating to -2007-2010.
- A C++ programme that applies those policy rules to a specified dataset and returns a dataset with the new variables added
- Various STATA routines for analysing these datasets to produce forecasts for additional variables, statistics such as poverty depth or headcount and totals for all households

The heart of SAMOD is the text file or dataset. The model works by applying particular policy rules to each individual to estimate their entitlements and tax or contribution liabilities and taking the weighted sum of these results to produce national estimates. SAMOD currently uses estimates of the expenditure and distributional effects of the policies shown below.

Table 1.7 SAMOD: current coverage of policies

Revenue	Expenditures
Income Tax	Foster Child Grants, Child Support Grants
Fuel levies	Disability Grants, Care Dependency Grants,
VAT and Excise Duties	Benefits from UIF contributions
Contributions to UIF	Old Age Grants, Grant in Aid
	Other - Income Tax Rebates

The SAMOD system can produce estimates for individuals in a number of ways:

[8]this means that it simulates the direct, first round, effects of policy on household income but does not account for behavioural changes that may take place as a result of changes in income or model any macroeconomic effects such as how changing income levels within households affects economic growth.

- *'ON-MODEL':* using data in the source survey. An example of this is the Child support grant
- *'PRE-MODEL* using data in the source survey and possibly merging it with other surveys to create a flag those entitled to a benefit or liable for a payment that can then be used on model For foster care for example it was necessary to create a 'likely to be a foster child' flag before the age criteria and means-test components of the grant can be used to simulate receipts.
- *USAGE BASED* relying on knowledge within the survey about the individual's current usage rather than their entitlement to a benefit (or possible merging information from another survey)
- POST MODEL: carrying out an operation such as rating up a payment to allow for inflation in STATA

Note that the first two methods relate to entitlements rather than take up. This is one reason why simple SAMOD simulations will never exactly match the present benefit totals recorded in administrative records[9]. Moreover the model is survey based so even usage based estimates will be subject to survey error. Making consistent forecasts will require the calculation of a benchmarking factor to apply to the raw SAMOD outputs.

Note also that some social benefits such as social relief of distress caused by natural disasters are inherently not possible forecast as they do not follow any particular rules.

Investigations have been made into the possibility of using SAMOD to estimate the benefits in table 1.3 and it seems that it should be possible to simulate some of the most important. In particular it will be possible to use SAMOD as way of looking at both the need for health and education services and the distribution of health and education expenditures made by government because both are highly correlated with demographic variables[10]. One area still subject to investigation is private pensions and we have commissioned further work from the actuarial association to look at this.

SAMOD has traditionally been used for static analysis of the costs and impacts of social policies. Forecasting with the models essentially a matter of finding a set of weights that are as close as possible to those in the base survey while producing weighted totals that are consistent with the demographic, labour market and macroeconomic projections[11]. A STATA command called CALIBRIX[12] has been developed specifically for this purpose as have routines for applying it using the various scenarios provided by ASSA. Charts 1 shows the numbers entitled to receive old age grants under the various demographic scenarios expressed as absolute numbers and as a proportion of the total population. The exercise (using SAMOD V1.1) appears to demonstrate that,

[9] See Wilkinson 2009 for an extensive discussion of the model and its success in estimating various benefits

[10] See the briefing paper prepared for National Treasury by McLeod, Grobler and van der Berg for an example relating to health

[11] Reweighting data used in a static microsimulation model like this is referred to as a 'static aging', as it ages the dataset but not the people in the dataset. Merz (1993) provides a useful discussion of the difference between static and dynamic microsimulation models (see especially pp. 3-4). His conclusion is that, 'A static aging procedure is relatively well-suited for short- and medium-range forecasts, provided it can be assumed that the characteristics of the population under examination do not change rapidly.Herault (2010) uses South African data and compares two methods for feeding macro-level outputs[11] into the reweighting of microdata for microsimulation. Buddelmeyer, Hérault, and Kalb's University of Melbourne working paper (3/09) use the reweighting approach to forecast over a 25-year period or so.

[12] The CALIBRIX command uses a more general command called CALIBRATE developed by John D'Souza of the UK's National Centre for Social Research and available at the website http://ideas.repec.org/c/boc/bocode/s457240.html.

at least for totals, our methodology produces sensible looking results. On a practical level it also demonstrates how little uncertainty their actually seems to be around demographic impacts.

Chart 1. Projection of numbers entitled to old age grant under various demographic Scenarios

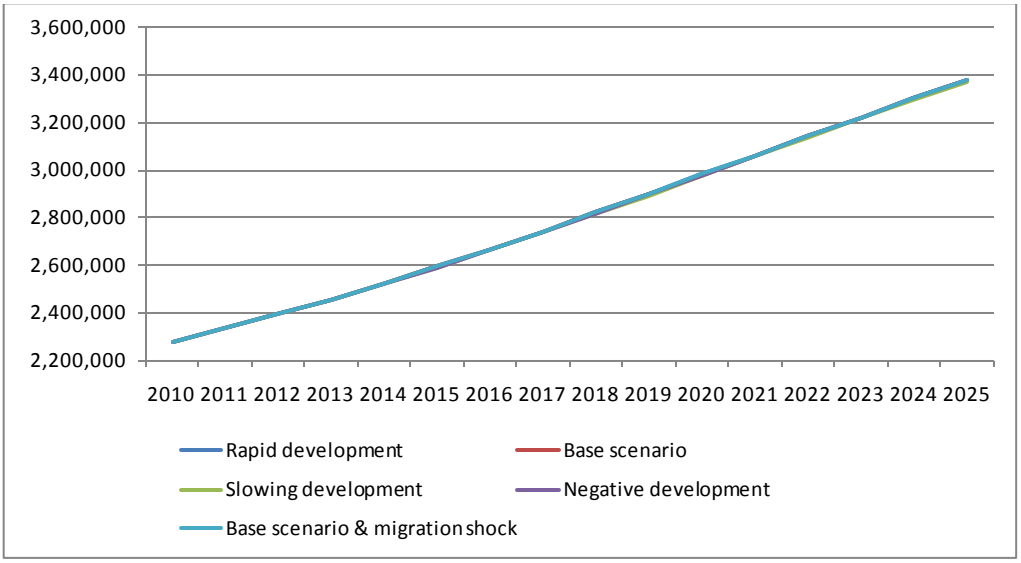
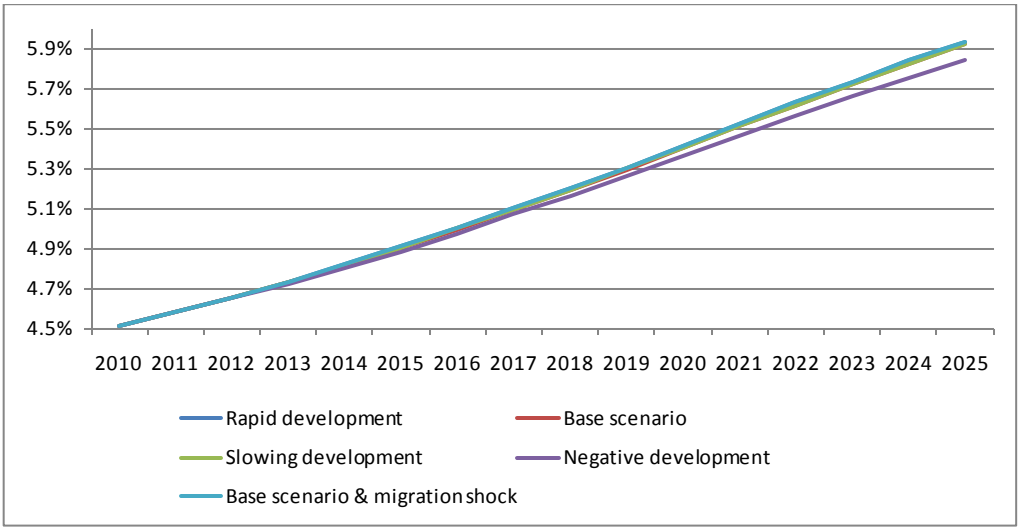


Chart 2. Projection of proportion of the population entitled to old age grant under various demographic Scenarios



Conclusions

This paper describes work in progress and it is too early to draw firm conclusions. However the findings presented here suggest that;

- It should be possible to embed a system for producing an annual Social Accounting System within an existing functional national statistical system with minimal extra burdens on the system
- Such a system can provide valuable insights into social policy
- It should be possible to build a robust Social Budgeting forecasting and simulation tool covering some of the most important aspects of a Social Budget using a microsimulation approach.