Detail Modelling Methodology

Contents

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1.1 The Social Accounting Matrix

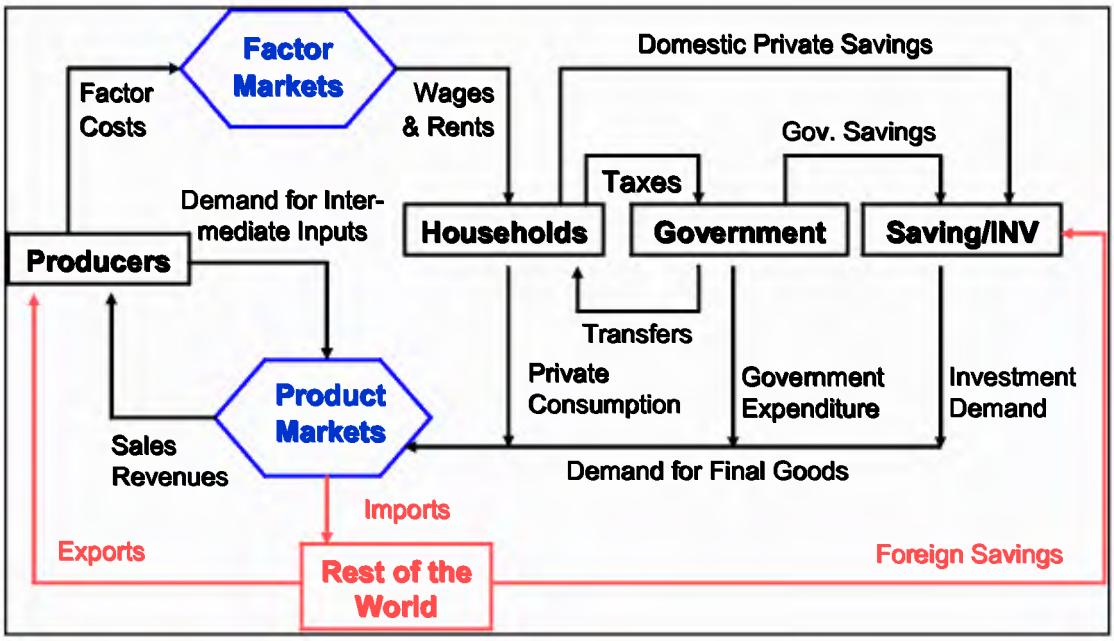
The 1993 System of National Accounts (SNA) defines the Social Accounting Matrix as 'the presentation of SNA accounts in a matrix which elaborates the linkages between Supply and Use tables and institutional sector accounts'.[1]

Social Accounting Matrices are developed from input-output tables. Input-output tables depict the supply and use of resources between industries. The earliest modelling using input-output tables can be attributed to Leontief (1941).

The Leontief input-output tables have a shortfall as they do not include institutions (household and government), and therefore do not show the distributional impacts of changes in the economy. This is where the Social Accounting Matrices (SAM) becomes useful. SAMs include households and government to show the distributional element in the economy. The direct and indirect economic impact of changes on the incomes of households can be established in this way. Modelling the economic impact of changes in the economy using a SAM still applies the Leontief approach of linearity and the Leontief inverse.

A SAM is a set of accounts written in a matrix format. These accounts map the flows in an economy between different role players in the economy, like consumers and producers, factor markets and product markets, imports and exports. Figure 1 shows the circular flow of income in the economy.

Figure1: Circular Flow of Income



The entries in the rows of a SAM represent the inflow of funds (or supply), while entries in the columns represent the outflow of funds (or use) occurring during a specific period, usually a year. Accounts traditionally found in a SAM include: activities; commodities; trade

[1] Overview of the 1998 Social Accounting Matrix, Statistics SA, 2004

margins; households; firms; government; labour; capital; the rest of the world; and savings and investment. Table 1 shows a summary of the entries of a SAM, entitled a National Accounting Matrix. This indicates the flow between the Current Account (Curr Acc), Capital Account (Cap Acc), RSA and the Rest of the World (RoW), Activities (Act), Commodities (Com), Labour (Lab), Capital (Cap), Firms, Households (HH), Government (Gov), Factor payments (Fac Pay), Goods and Services (G&S), and Transfers and Capital (Cap).

Table 1: National Accounting Matrix for Gauteng for 2004

					Cur Acc								Cap Acc		RSA & RoW								Total
			Act	Com	FOP		Inst						Gov	Other	Fac Pay		G&S		Transfers		Cap		
					Lab	Cap	Firms	HH	Gov (nas)	Gov (prov)	Gov (loc)				RSA	RoW	RSA	RoW	RSA	RoW	RSA	RoW	
		Act	-	1 020.8	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	1 020.8
		Com	599.4	-	-	-	-	312.7	24.1	18.1	19.6		8.9	48.4	-	-	288.3	82.1	-	-	-	-	1 401.6
Cur Acc	FOP	Lab	211.5	-	-	-	-	-	-	-	-		-	-	22.3	1.0	-	-	-	-	-	-	234.8
		Cap	200.6	-	-	-	-	-	-	-	-		-	-	132.1	5.8	-	-	-	-	-	-	338.5
	Inst	Firms	-	-	-	197.0	-	-	26.1	0.5	2.2		-	-	-	-	-	-	-	-	-	-	225.7
		HH	-	-	179.4	-	172.4	3.4	1.6	1.5	-		-	-	-	-	-	-	0.5	0.2	-	-	358.9
		Gov (nas)	9.4	42.5	-	2.8	26.6	34.1	1.7	-	-		-	-	-	-	-	-	-	1.0	-	-	118.0
		Gov (prov)	-	-	-	0.2	1.0	0.7	23.6	-	-		-	-	-	-	-	-	-	-	-	-	25.5
		Gov (loc)	-	-	-	-	12.9	5.6	0.8	0.7	-		-	-	-	-	-	-	-	-	-	-	20.0
Cap acc		Gov	-	-	-	6.0	-	-	39.2	4.8	(1.8)		-	-	-	-	-	-	-	-	-	-	48.2
		Other sec	-	-	-	38.5	12.7	1.2	-	-	-		-	-	-	-	-	-	-	-	-	-	52.5
RoW		Fac pay	-	-	55.4	94.0	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	149.4
		G&S	-	338.3	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	338.3
		Transf	-	-	-	-	0.1	1.3	1.0	-	-		-	-	-	-	-	-	-	-	-	-	2.3
		Bal Cur Acc	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	(31.2)	(12.2)	(43.3)
		Cap	-	-	-	-	-	-	-	-	-		39.3	4.1	-	-	-	-	-	-	-	-	43.3
Total			1 020.8	1 401.6	234.8	338.5	225.7	358.9	118.0	25.5	19.9		48.2	52.5	154.4	6.8	288.3	82.1	0.5	1.2	(31.2)	(12.2)	-

Source: Conningarth 2005

A SAM is generally used in monitoring the impact of government policies and/or external influences on non-monetary variables such as employment levels, skills development training, and demographic changes.

Because the SAM provides a 'photograph' or snapshot of the economy at a particular point in time, the CGE model based on this SAM provides a comparative static interpretation of policy impacts and economic injections.

Table 2 gives a high-level overview of the relationships presented within a SAM. It is seen from this table that the SAM captures such transfers as occur between a variety of different categories and sectors, including those to and from government, remuneration and sector production, and others. A detailed discussion of the Social Accounting Matrix can be found in the publication *Overview of the 1998 South African SAM* (Stats SA, 2002).

Table 2: Institutional units cross-classified by category and sector

Sector / Category	Non-financial corporations sector	Financial corporations sector	General government sector	Household sector	NPI serving household sector
Corporations	Non-financial corporations	Financial corporations			
Government units			Government units		
Households				Households	
Non-profit institutions	Non-financial market NPIs	Financial market NPIs	Non-market NPIs controlled and financed by government		Non-market NPIs serving households

Source: Final Social Accounting Matrix 1998, Stats SA, 2002

1.1.1 Economic sub-sectors

In order to provide a detailed and disaggregated impact which highlights specific areas of growth, and also economic linkages, the 54 sub-sectors contained in the South African SAM are used. These economic sub-sectors follow the definitions as provided in the Standard Industrial Classification (SIC)[2] system. The sub-sectors we have identified for inclusion in the model are presented in Table 3:

Table 3: 46 Economic sub sectors used in GDP-R Model

Agriculture, forestry & fishing	Motor vehicles, parts & accessories
Coal mining	Other transport equipment
Gold & uranium ore mining	Furniture
Other mining	Other industries
Food	Electricity, gas & steam
Beverages & tobacco	Water supply
Textiles	Building construction
Wearing apparel	Wholesale & retail trade
Leather & leather products	Catering & accommodation services
Footwear	Railway transport
Wood & wood products	Road transport
Paper & paper products	Transport via pipeline

[2] Please refer to http://www.statssa.gov.za/additional_services/sic/sic.htm for a detailed description of the SIC codes

Printing, publishing & recorded media	Water transport
Coke & refined petroleum products	Air transport
Basic chemicals	Transport support services
Other chemicals & man-made fibres	Communication
Rubber products	Finance & insurance
Plastic products	Business services
Glass & glass products	Medical, dental & other health & veterinary services
Non-metallic minerals	Community, social & personal services
Basic iron & steel	Government: General administration
Basic non-ferrous metals	Government: Defence
Metal products excluding machinery	Government: Law and order
Machinery & equipment	Government: Education
Electrical machinery	Government: Health
Television, radio & communication equipment	Government: Social
Professional & scientific equipment	Government: Economic