Developing a Social Accounting Matrix for Regional Policy Analysis: KwaZulu-Natal SAM 2005

Compiled by

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Provincial Treasury
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Acronyms

AIDS	Acquired Immune Deficiency Syndrome
ASGISA	Accelerated and Shared Growth Initiative South Africa
BBBEE	Broad Based Black Economic Empowerment
CBA	Cost Benefit Analysis
CGE	Computable General Equilibrium model
EPWP	Extend Public Works Program
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GDP-R	Gross Domestic Product per Region
GVA	Gross Value Added
HDI	Human Development Index
HIV	Human Immuno-deficiency Virus
IDP	Integrated Development Plan
IO	Input Output
LED	Local Economic Development
MDG	Millennium Development Goal
MTEF	Medium Term Expenditure Framework
NAM	National Accounting Matrix
NGOs	Non-government Organisations
NPISHs	Non-profit Institutions Serving Households
RSUT	Regional Supply and Use Table
SAM	Social Accounting Matrix
SARB	South African Reserve Bank
SCM	Supply Chain Management
SNA	System of National Accounts
Stats SA	Statistics South Africa
SU-Tables	Supply and Use Tables

1 Background

1.1 Introduction

Persistent income inequalities in KwaZulu-Natal oblige us to recognise that growth can be unbalanced, non-inclusive and unsustainable. How, then, is pro-poor growth to be achieved in the province? Put differently, how do we ensure that additional national income will reach a targeted group? This is important because policy makers need to know not only what the growth impact will be of their investments or initiatives but also the impact on poverty and other social determinants.

Through a scientific quantitative approach (such as the Social Accounting Matrix, SAM) that measures the impact of, say, a 1% increase in real Gross Domestic Product (GDP) on households of different income, race, gender, occupation and age groups, it will be possible to address these questions and provide policy makers with better advice on how to achieve an optimal allocation of resources. That makes it important to develop a regional Social Accounting Matrix (SAM) for the province.

SAM is a well-equipped tool for analyzing the socio-economic impact of any government project. It provides a snapshot picture of the economy for a single year, showing, among other things, how income is generated, how it is distributed among different households, and how different households spend their income. SAMs are used to build economy-wide macroeconomic models explicitly designed to analyze the distributional impacts of policy change – namely, the effects on employment, incomes and poverty for different household groups. The uniqueness of this economic model is its capacity to show to what extent (a) a social or economic policy, (b) an infrastructure project, (c) a public or private investment, and (d) any other public and private initiative affects people of different (a) gender, (b) race, (c) income group, (d) regions, (e) professions. It also shows at regional level how public and private interventions impact on various institutions and economic sectors. That makes it a uniquely apt tool to analyze government policies and strategies that seek to address broad development challenges

The development of the Social Accounting Matrix for Kwazulu-Natal was guided by the following questions:

(i)   What informs the choice and design of government initiatives?

(ii)   What determines the robustness of a policy or strategy, and how sensitive is development strategy to external events such as trade regulations and energy price increases?

(iii)   How does government ensure that an additional R1 in the fiscus reaches a targeted social group? Who benefits from economic growth?

(iv)   To what extent do government policies, strategies and initiatives contribute to the achievement, as government goals and objectives, of economic growth, poverty alleviation, and job creation? Is growth pro-poor?

(v)   To what extent are households affected unequally by external economic factors such as oil price increases, drought, or the 2010 FIFA World Cup?

(vi)   Will the growth in the leading sectors be sufficient to achieve the desired level of growth in Gross Domestic Product per Region (GDP-R)? If the province is moving away from a resource-based (primary sector) economy,

thereby creating a gap between various sectors, by how much will other sectors need to grow to eliminate the gap?

(vii) Given a regional policy target of 10% economic growth and 10% increase in job creation by, say, 2015, how much sector input, skill level, etc., will be required to achieve that target. Once reached, what will be the impact of such growth on household well-being?

This paper will show, among other things, what level of future growth is sustainable in the province and what input (sector, labour, skill, etc.) is required to achieve such growth. It shows how income is generated in the province and, more importantly, how it is distributed among households of different income groups, occupation and race. The paper examines the development and performance of key fiscal and socio-economic indicators and considers how an additional R1 in the fiscus will impact both the regional economy as a whole and the well-being of specific categories of households in targeted groups.

1.2 Aim

This paper is aimed at providing the methodology for developing a regional SAM based on the United Nations 1993 System of National Accounts (SAM, 1993). It further demonstrates how the SAM can be used to analyze the socio-economic impact of government projects and/or initiatives on the province as a whole. Importantly, it highlights how a regional SAM provides strategic information for policymakers.

1.3 Users and beneficiaries of the provincial SAM

What makes KwaZulu-Natal a good case study for regional policy analysis is, on the one hand, its high rates of poverty, unemployment, illiteracy, HIV and AIDS, and the number of its inhabitants (highest in the country) who lack access to infrastructure, and, on the other, its level of government budget expenditure (also highest in the country). Integrating regional SAM modelling in the development planning process will help to focus dialogue on feasible economic objectives and concrete actions to achieve them. The value of a regional SAM for policy dialogue lies in its ability to quantify the mostly qualitative descriptions of sector strategies often contained in planning documents, enabling calculation of the economic outcomes. Examples of outcomes include the number of jobs created (by skill level, by industry/sector, by gender, and by race) and the wages paid, the distribution of income among different household groups, and the effects of growth in manufacturing both on upstream industries (suppliers of inputs like raw materials, electricity, transportation, etc.) and downstream (on product users such as consumers and other industries, on transportation, etc.). The effects of foreign direct investment, domestic and foreign trade, and infrastructure projects are best assessed using the SAM. In this regard, the range of policy applications of the SAM will include, among other things,

- Government policy: officials involved in planning and policy analysis can assess, monitor and conduct impact studies on policy issues such as tax policy (the impact of different forms of taxation on households and other socio-economic variables), labour policy (the number of jobs created), and a variety of other policy areas such as HIV and AIDS, Gender, Broad Based Black Economic Empowerment (BBBEE), Supply Chain Management (SCM), environment, etc.
- Investment policy: sector analysis is needed in both private and public sector planning initiatives.

A regional SAM enables Government departments, universities, non-government organisations (NGOs), researchers, investors, and a range of other policy makers to think systematically about the kind of initiative they want and the requisite steps for implementation.

1.4 Stages of the model

The genesis of the present project involved disaggregating Gross Value Added (GVA) of key sectors in the province. A number of "Regional Economic Analysis Profiles", were produced as unpublished documents for 2004 to 2006, and the outcomes were released in the *Province of KwaZulu-Natal 2007–08 Budget Statement*s.

The regional GVA data were used as a foundation for developing Regional Supply and Use Tables for 2001 reference year. These were published in book form in 2004 as *Regional Economic Analysis with Supply and Use Tables: A Model for KwaZulu-Natal*. The KZN *Supply and Use Tables* (SU-Tables) for 2001, 2004 and 2005 reference years are available at KZN Treasury. A second booklet entitled *Regional Sector Analysis Model with Supply and Use Tables* which contains the KZN SU-Tables for 2005 reference year has now also been released.

The KZN SU-Tables 2005 were used to compile the KZN SAM (2005) as contained in a publication entitled "*The Development of a Social Accounting Matrix (KwaZulu-Natal SAM, 2005) for Regional Policy Analysis*". The 2005 SAM will serve as a building block for the construction of the Computable General Equilibrium Model (Figure 1).

Figure 1: Regional economic model and the system of national accounts
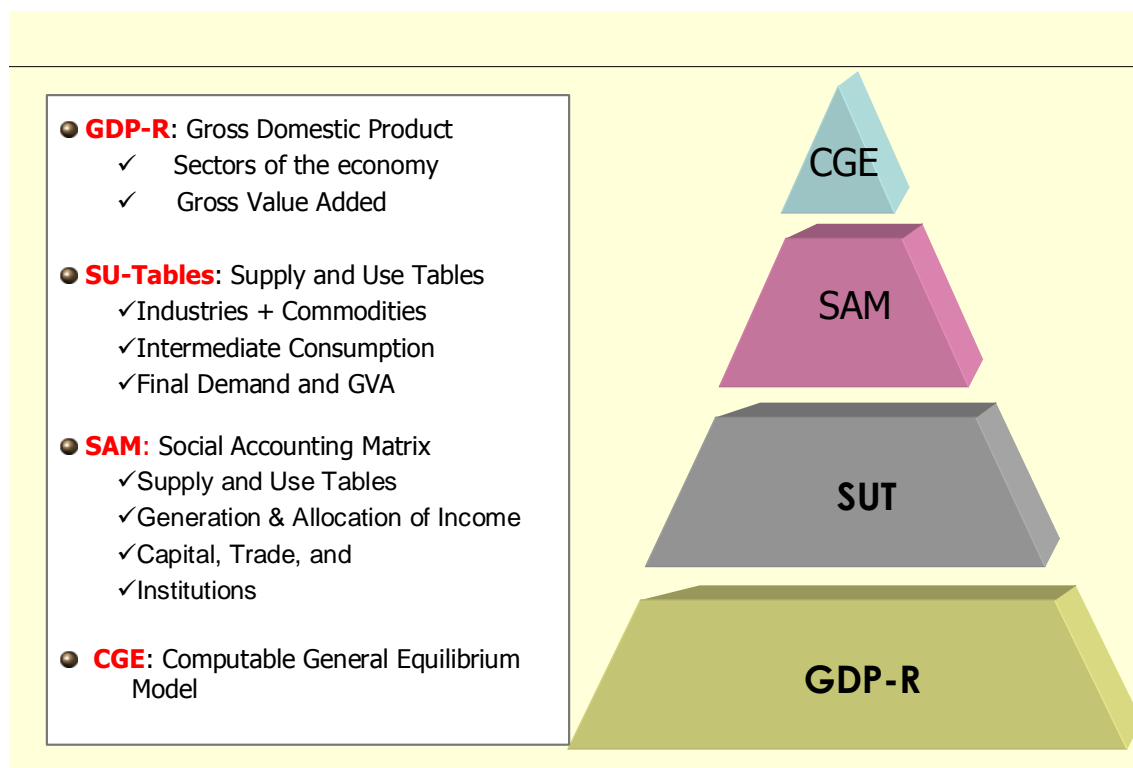
Source: KwaZulu-Natal Provincial Treasury, 2007

1.5 Methodology and outline of the document

The flow chart in Figure 2 which locates the role of the SAM in the strategic and policy planning process also serves to outline the structure of this paper, in which (1) the problem statement is identified through a profile of the province; (2) appropriately informed strategy for optimal allocation of scarce resources is achieved through the SAM; (3) the SAM then serves as a tool for formulation, monitoring and evaluation of policy to enable policy makers to achieve specified goals and objectives. Section 2 of the paper accordingly profiles economic development and performance for the province of KwaZulu-Natal: key socio-economic indicators are analysed to provide the reader with salient features of the provincial economy. Section 3 of the paper provides a literature review, considers the theoretical foundation of the SAM, and discusses various techniques used in developing, estimating, balancing and updating the SAM. Section 3 also discusses the list of integrated economic accounts and the structure of the Macro SAM and summarizes the methodology used to estimate missing data for the Micro SAM. The construction of the KwaZulu-Natal SAM is dealt with in detail in Section 4. Starting from the Micro SAM and Macro SAM, and leading on to modelling with SAM, this section of the paper also shows how the KZN Supply and Use Tables were incorporated into the SAM. Section 5 of the paper shows the relevance of KZN SAM in the provincial strategy and policy planning processes with an analysis of selected results. A conclusion ends the paper.

1.6 The role of the KZN SAM in the strategic and policy planning process

In addressing the pressing challenges of socio-economic development (such as poverty and unemployment), the KwaZulu-Natal provincial government has identified several key interventions and initiatives[1] which have in common the aim of maximizing service delivery and improving the welfare of communities. Budget constraints and limited resources can turn strategic planning and prioritization into a nightmare, which is why the KwaZulu-Natal regional SAM is presented in the hope that it will serve policy makers by informing their strategic planning as they seek to determine the best possible allocation of resources (Figure 2).

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[1] The KwaZulu-Natal Provincial Treasury Budget Statement (2007/08) provides more details on these initiatives.

Figure 2: Diagram of role of SAM in strategic and policy planning process
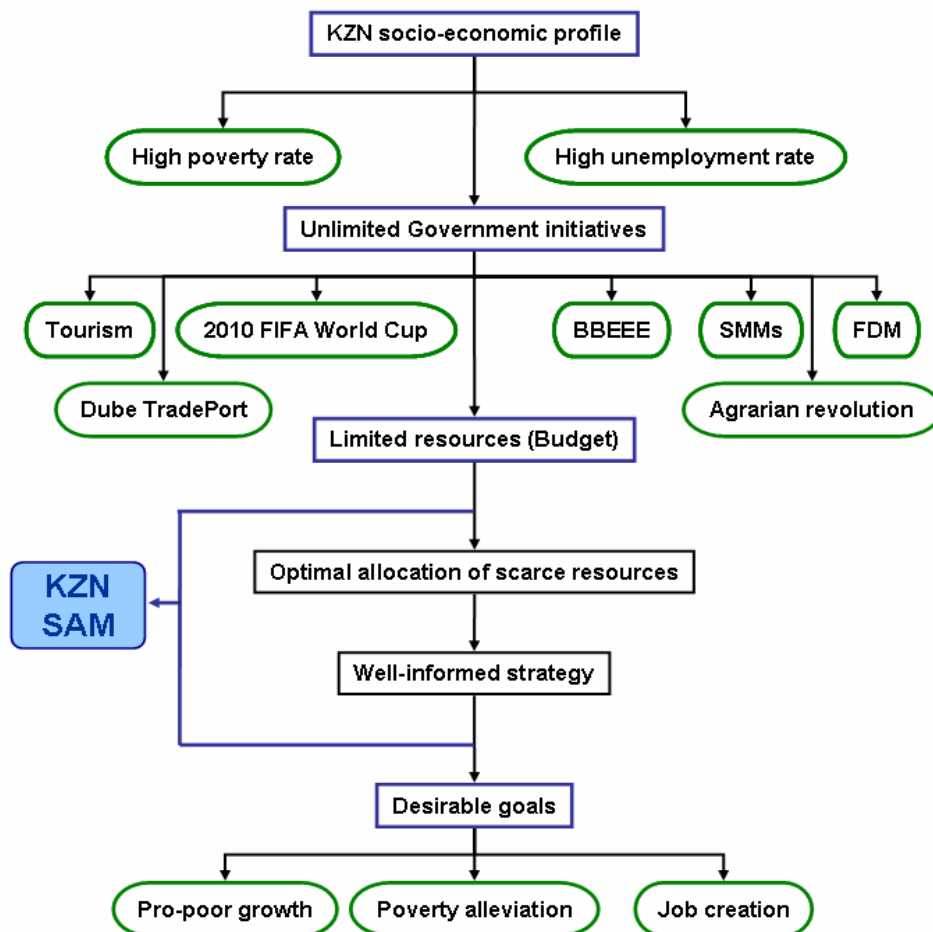
Source: KwaZulu-Natal Provincial Treasury, 2007

2 KZN socio-economic development, performance and trends

2.1 Social, economic and fiscal dynamics and trends 1995–2006

Poverty reduction and massive job creation have over the past decade been identified as key strategic priorities in the province. This section provides a trend analysis of selected social, economic, and fiscal indicators. Ideally, what we would wish to see would be an upward trend in macro-economic performance – measured by growth in real Gross Domestic Products (GDP) with sound fiscal development – and a reversed trend in unemployment and poverty. Table 1 show that the province of KwaZulu-Natal has not yet achieved such ideal performance.

Table 1: Indices: KZN key socio economic indicators 1995–2006

	Poverty*	Unemploy-ment*	Economically active population*	Real GDP-R**	Total budget***	Social sector budget***	Population**
1995	100	100	100	100	100	100	100
1996	103	106	106	104	119	111	102
1997	109	116	112	107	128	127	104
1998	118	129	118	108	123	138	106
1999	121	132	123	109	126	143	108
2000	126	140	129	114	146	161	109
2001	132	151	134	119	167	182	110
2002	134	165	128	122	192	211	112
2003	132	169	130	126	228	249	119
2004	134	170	124	131	261	285	118
2005	130	170	128	138	306	335	117
2006	133	178	129	147	341	------	121
Total Increase 1995-2006	**33%**	**78%**	**29%**	**47%**	**241%**	**235%**	**21%**

Source:* Global Insight, ** Statistics South Africa, ***KwaZulu-Natal Provincial Treasury.

Table 1 and Figure 3 show a net 21% increase in the population. Unemployment has increased faster (78%) than the economy (47%), and faster than the economically active population (29%). In other words, the percentage increase in the number of people entering the labour market outpaces the percentage increase in the number of unemployed people. In addition, while the provincial social sector budget has more than doubled (by 235%), poverty has increased by one third.

The poverty increase is proportionately higher than the net increase in population. Trying to understand why poverty and unemployment persist despite a substantial increase in government expenditure requires an evaluation of government policy and government expenditure. In policy making at a micro level, sustainable, cost-effective developmental projects and high socio-economic impact investment in line with the priorities of broad government policy need to be identified, implemented and monitored.

Figure 3: Indices: key socio economic indicators 1995–2006
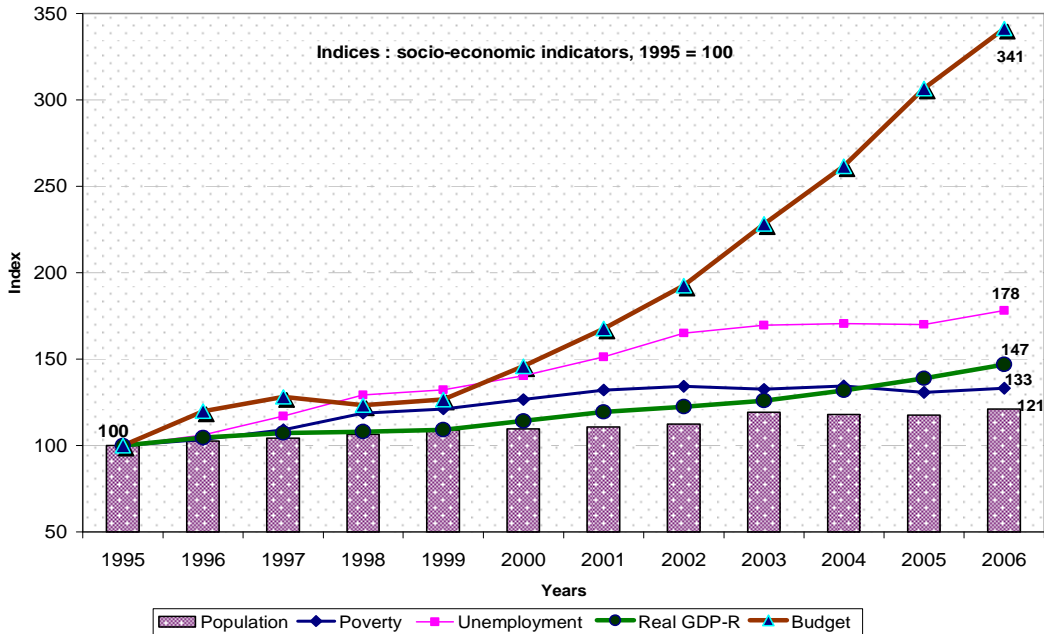
Source: Global Insight, Statistics South Africa, KwaZulu-Natal Provincial Treasury

The provincial real GDP and budget expenditure (except for 1998) have persistently grown over the period under review (Figure 3 and Figure 4). Trends indicated in Figure 4 show that fluctuations in poverty and unemployment levels followed a similar pattern – which is to be expected, since increased unemployment pushes poverty up.

Figure 4: Growth rates: key socio-economic indicators 1996–2006
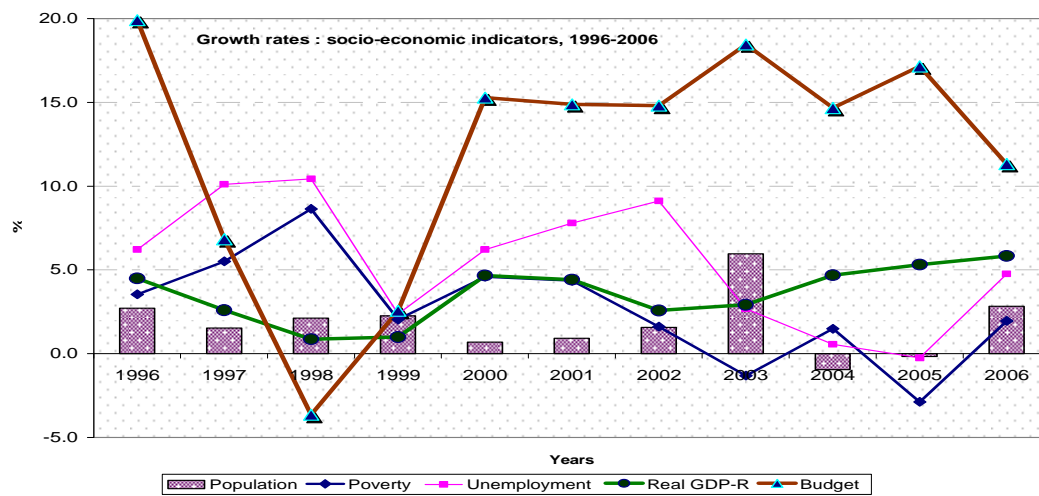
Source: Global Insight, Statistics South Africa, KwaZulu-Natal Provincial Treasury.

Table 2: Ratios: KZN key socio-economic indicators 1995–2006

	Poverty/ Population	Unemployment /population	Real GDP-R per Capita	Total Budget expenditure per capita	Total Budget/ GDP-R
1995	48.2	11.6	16,113	1,824	11.3
1996	48.6	12.0	16,393	2,129	13.0
1997	50.5	13.0	16,563	2,240	13.5
1998	53.7	14.1	16,360	2,114	12.9
1999	53.6	14.1	16,155	2,120	13.1
2000	55.7	14.8	16,792	2,427	14.5
2001	57.6	15.9	17,374	2,763	15.9
2002	57.6	17.0	17,547	3,123	17.8
2003	53.7	16.5	17,043	3,492	20.5
2004	55.0	16.8	18,013	4,044	22.4
2005	53.5	16.7	19,001	4,745	25.0
2006	53.0	17.1	19,557	5,137	26.3

Source: Global Insight, Statistics South Africa, Provincial Treasury.

In 2005 (see Table 2) the steadily increasing size of provincial government expenditure for the first time reached a quarter of total GDP-R. In per capita terms, both GDP-R and total expenditure show a significant increase, signalling positive regional performance and development over the entire period under review. Much less encouraging, on the other hand, is the increase in the ratios of both poverty and unemployment to total population, where one contributing factor is the level of literacy in the province, coupled with the uneven distribution of wealth. Further explanatory data is to found the Human Development Index (HDI) and the Gini coefficient trends presented in Figures 5 and 6.

Figure 5 gives a sketch of the Human Development Index (HDI) for KwaZulu-Natal between 1996 and 2006. In 1996 the estimated index was 0.52, rising to 0.57 in 2006.

Figure 5: Human Development Index 1996–2006

Human Development Index: 1996 - 2006

Source: Global Insight, 2006

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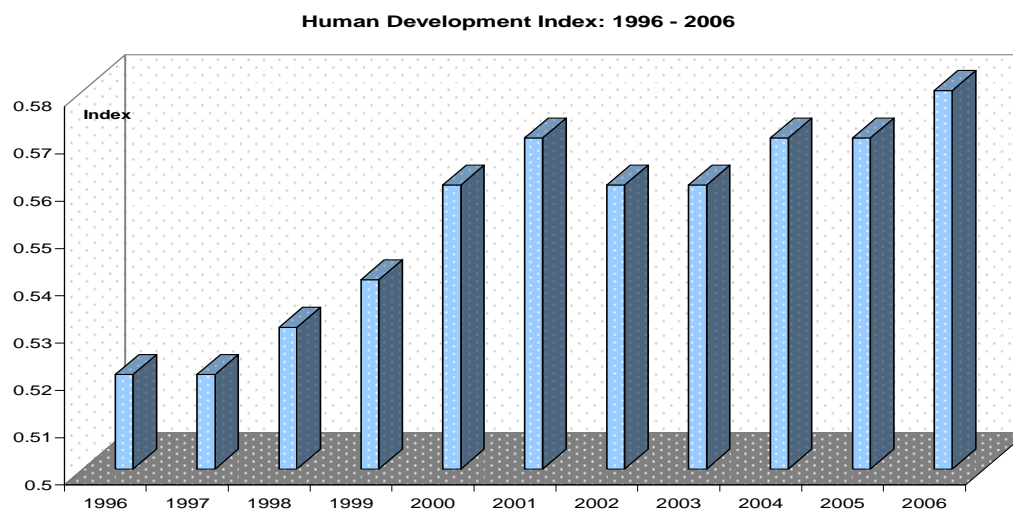
Table 3: KwaZulu-Natal poverty indicators by race 2005

Poverty Indicators, 2005	Blacks	Whites	Coloureds	Indians	Total
People living in poverty (%)	60.6	2.9	12.9	7.5	51.9
Poverty Gap (Rand Million)	8,173	43	32	76	8,324
Number of people with no schooling	635,435	810	1753	20,467	658,465
Literate (20+age, Grade 7or higher)	2,963,727	455,139	76,225	514,969	4,010,060
Illiterate (20+age, Grade 7or lower)	1,608,741	1,158	7,278	57,097	1,674,275
Urbanization rate	39.1	97.1	88.3	91.2	48.1

Source: Global Insight, 2006

The HDI is a composite relative index that attempts to quantify the extent of human development of a community. It is based on measures of life expectancy, literacy and income. It is therefore seen as a measure of people's ability to live a long and healthy life, to communicate, to participate in the life of the community and to have sufficient resources to obtain a decent living (DBSA 2005: 22). An HDI of 0.800 or above shows high human development. Medium human development is reflected by an HDI of between 0.500 and 0.799. An HDI of less than 0.500 signifies low human development (UNDP, 2003). In fact throughout the period under review, the HDI for the province was lower than the national average. These HDIs have actually declined (from 0.705 in 1990 to 0.715 in 1995, and from 0.720 in 1990 to 0.735 in 1995 for KwaZulu-Natal and for South Africa respectively, as estimated by the United Nations Development Programme).

Figure 6: Gini coefficient 1996–2006

Gini Coefficient: 1996 - 2006
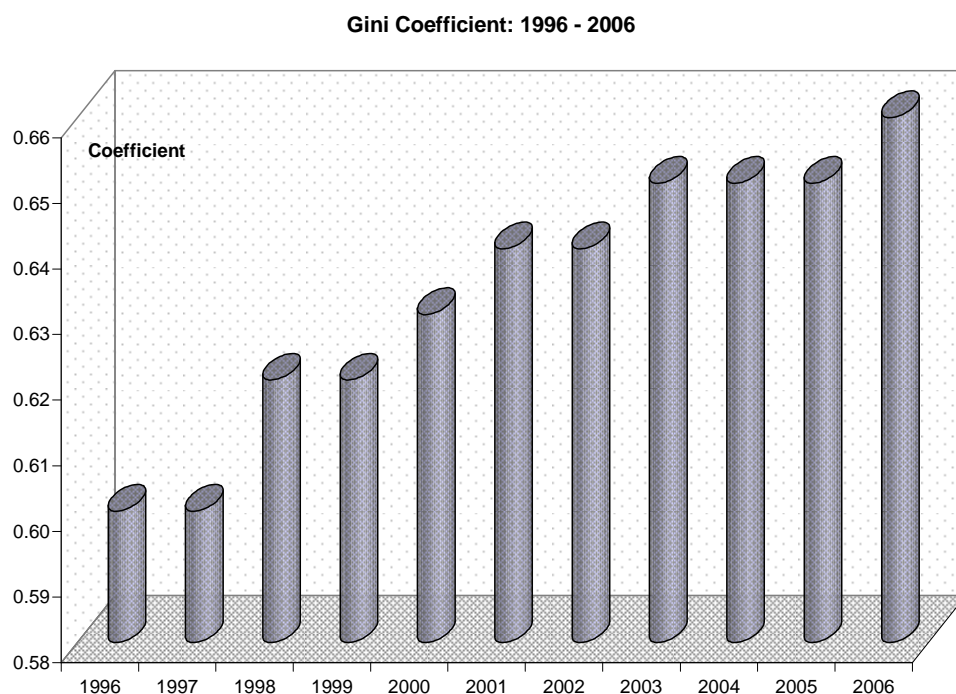
Source: Global Insight, 2006

The Gini coefficient is based on the Lorenz curve, a cumulative frequency curve that compares the distribution of income with a uniform distribution that represents equality. This equality distribution is represented by a diagonal line, and the greater the deviations of the Lorenz curve from this line, the greater the inequality (Pan American Health Organisation, 2005). The coefficient varies from zero (which indicates perfect equality, with every household earning exactly the same income) to one (which implies absolute inequality). In practice, the coefficient is likely to vary from approximately 0.25 to 0.70.

The rising HDI could be attributable to the improving level of literacy in the province.

KwaZulu-Natal HDI is in the 0.50 to 0.79 bracket which signifies Medium Human Development. HDI improvement hinges on developments such as extended longevity, rising literacy rates and reduced income inequalities. Although KZN literacy rates do show some improvement, much more still needs to be achieved in reducing mortality and income inequality.

The uneven distribution of wealth and high poverty levels for the majority of people in rural areas remain a multidimensional challenge for the province. Figure 6 shows the Gini coefficient in the province of KwaZulu-Natal for the years 1996 to 2006.

It reveals an increase in the coefficient signalling a persisting inequality, a gap that needs to be reduced. Incentives aimed at boosting the economic activities and self-reliance of poor people should strongly be encouraged.

Table 3 provides more information on the extent of inequality in the province of KwaZulu-Natal. The majority of Black communities still live in deep rural areas where they are caught in extreme poverty. The proportion of the black population living in poverty (60%) produces the scale of the poverty gap in the province and underlines the need for policy such as Broad Based Black Economic Empowerment (BBBEE).

In regard to poverty levels, 54 out of every 100 people in the province lived in poverty in 2004. This fell to 52 in 2005. The small drop from 5,166,205 in 2004 to 5,162,353 in 2005 in the total number of people in poverty made little difference to general prevalence of poverty among African Blacks during this period (averaging 60.6%), compared to Coloureds (12.9%), Whites (2.9%) and Indians (7.5%).

Reduction of the illiteracy level, including the number of people with no schooling, is one of the Millennium Development Goals (MDG). Table 3 shows that the province of KwaZulu-Natal will need to work hard to reach the MDG target.

At local level, these poor and illiterate Black people are in most cases residents of rural municipalities. The Local Economic Development (LED) strategy in KwaZulu-Natal should have specific steps for addressing the issues that most concern this socio-economic group, but due to lack of capacity the Integrated Development Plans (IDP) compiled by the municipalities are, regrettably, not adequately implemented, monitored or evaluated.

If well formulated and adequately implemented, LED strategy in conjunction with industrial strategy should lead to high sector gross value added. Table 4 presents the trend for each economic sector together with overall performance figures for the KwaZulu-Natal economy.

Table 4: Key economic indicators 1995–2005

Indicator	Unit	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
GDPR at constant 2000 prices	R millions	132,048	137,980	141,548	142,774	144,183	150,913	157,578	161,642	166,359	174,132	183,382
GDP per capita	Constant R	16,112	16,487	16,564	16,361	16,156	17,038	17,373	17,547	17,043	18,015	19,001
GDPR per capita in constant Rands (change)	Percent	-	2.3	0.5	-1.2	-1.3	5.5	2.0	1.0	-2.9	5.7	5.5
KwaZulu-Natal's GDPR/ South Africa's GDP	Percent	16.4	16.5	16.4	16.5	16.3	16.4	16.6	16.5	16.4	16.4	16.4
KwaZulu-Natal's GDPR deflator	Index	69.7	75.4	81.0	86.8	92.1	100.0	106.9	118.4	124.6	132.4	137.0
KwaZulu-Natal's Ogive/Tress	Index	52.0	48.2	47.4	45.9	47.1	49.5	47.6	52.8	53.6	52.0	55.5
Primary sector: KwaZulu-Natal's sector GVA/ South Africa's sector GVA	Percent	12.1	12.9	13.3	13.9	11.8	11.5	11.1	10.3	11.1	11.3	11.4
Secondary sector: KwaZulu-Natal's sector GVA/South Africa's sector GVA	Percent	20.5	20.5	20.4	20.2	20.2	20.5	20.8	20.7	20.3	20.2	20.3
Tertiary sector: KwaZulu-Natal's sector GVA/South Africa's sector GVA	Percent	16.0	16.1	15.8	15.8	15.7	15.7	15.9	16.0	16.0	15.9	15.9
Distribution of GVA per sector	**Unit**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Agriculture	Percent	4.8	5.3	5.1	5.1	4.9	4.9	4.7	4.8	4.7	4.5	4.5
Forestry	Percent	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Fishing	Percent	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Coal mining	Percent	0.7	0.9	1.0	0.9	0.7	0.6	0.6	0.5	0.5	0.4	0.5
Gold mining	Percent	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1
Other mining and quarrying	Percent	1.4	1.9	1.9	1.8	1.3	1.2	1.1	1.0	1.0	1.1	0.9
Food, beverages and tobacco	Percent	4.5	4.4	4.5	4.1	4.0	4.1	4.0	4.0	3.6	3.6	3.9
Textiles, clothing and leather goods	Percent	2.9	2.6	2.6	2.4	2.3	2.3	2.1	2.2	2.2	2.2	2.3
Wood and paper; publishing and printing	Percent	3.3	3.0	3.1	3.1	3.0	3.1	2.9	2.8	2.8	2.8	2.9
Petroleum products, chemicals, rubber and plastic	Percent	4.3	4.3	4.3	4.8	5.2	5.6	5.7	5.4	5.3	5.3	4.9
Other non-metal mineral products	Percent	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Metals, metal products, machinery and equipment	Percent	4.0	4.2	4.3	4.0	3.9	3.9	3.9	4.2	4.2	4.2	4.0
Electrical machinery and apparatus	Percent	0.7	0.6	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.6
Radio, TV, instruments, watches and clocks	Percent	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3
Transport equipment	Percent	2.0	1.9	1.8	1.8	1.9	2.1	2.3	2.2	2.1	2.1	2.0
Furniture and other manufacturing	Percent	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2
Electricity	Percent	2.3	2.5	2.5	2.4	2.3	2.3	2.2	2.4	2.0	2.0	1.9
Water	Percent	0.7	0.7	0.7	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.5
Construction	Percent	3.1	2.9	3.0	2.6	2.4	2.4	3.1	2.4	2.4	2.6	2.7
Wholesale & retail trade	Percent	12.4	12.1	12.0	12.0	12.8	13.2	13.7	13.6	14.2	14.3	14.4
Catering and accommodation	Percent	1.1	1.0	1.0	1.0	1.0	0.9	1.0	1.0	1.0	1.0	1.1
Transport	Percent	9.2	9.0	9.1	9.1	9.2	9.2	9.1	9.4	9.8	9.4	10.1
Communication	Percent	2.4	2.6	2.9	3.3	3.5	3.6	3.8	4.3	4.4	4.7	4.0
Finance and insurance	Percent	5.2	5.6	5.9	5.8	6.5	6.4	6.8	7.1	7.4	7.7	7.0
Business services	Percent	9.5	9.4	9.4	9.7	9.7	9.2	9.1	9.1	9.1	9.4	10.1
Community, social and other personal services	Percent	6.1	5.9	5.8	6.1	6.2	6.2	6.1	6.1	6.2	6.0	6.0
General government services	Percent	15.2	15.0	14.4	14.5	13.8	13.1	12.7	12.4	12.3	12.0	11.8
Provincial GDPR	Percent	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Figure 7: KwaZulu-Natal *vs* RSA GDP 1996–2005
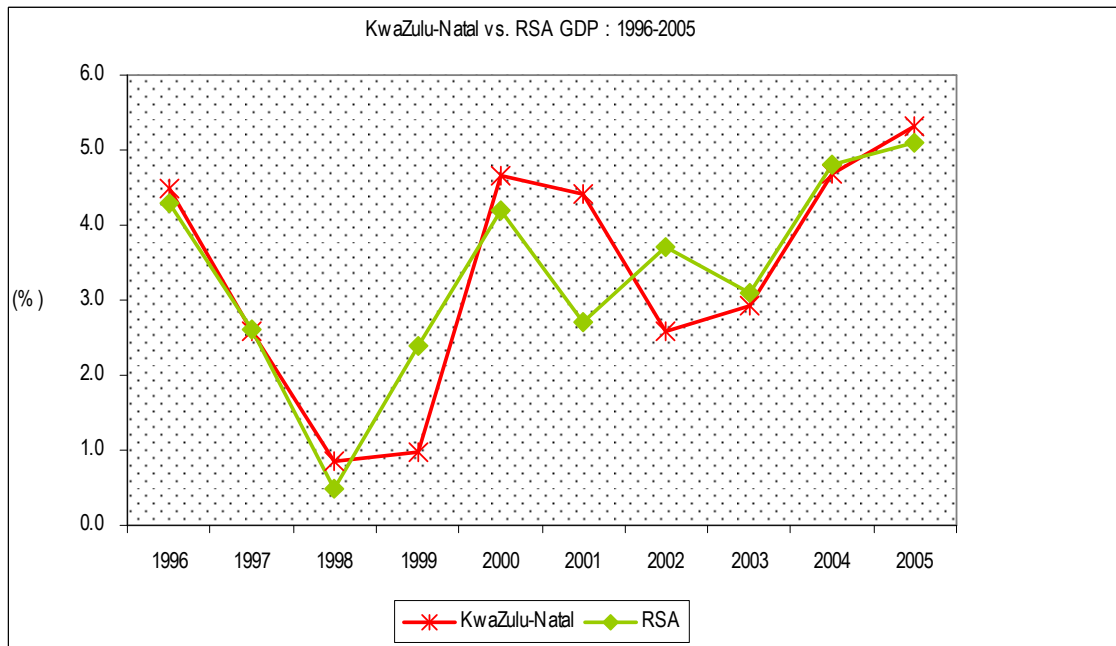
Source: Statistic South Africa, 2006

Figure 8: KZN Industry contributions & growth rates

Source: Statistic South Africa, 2006

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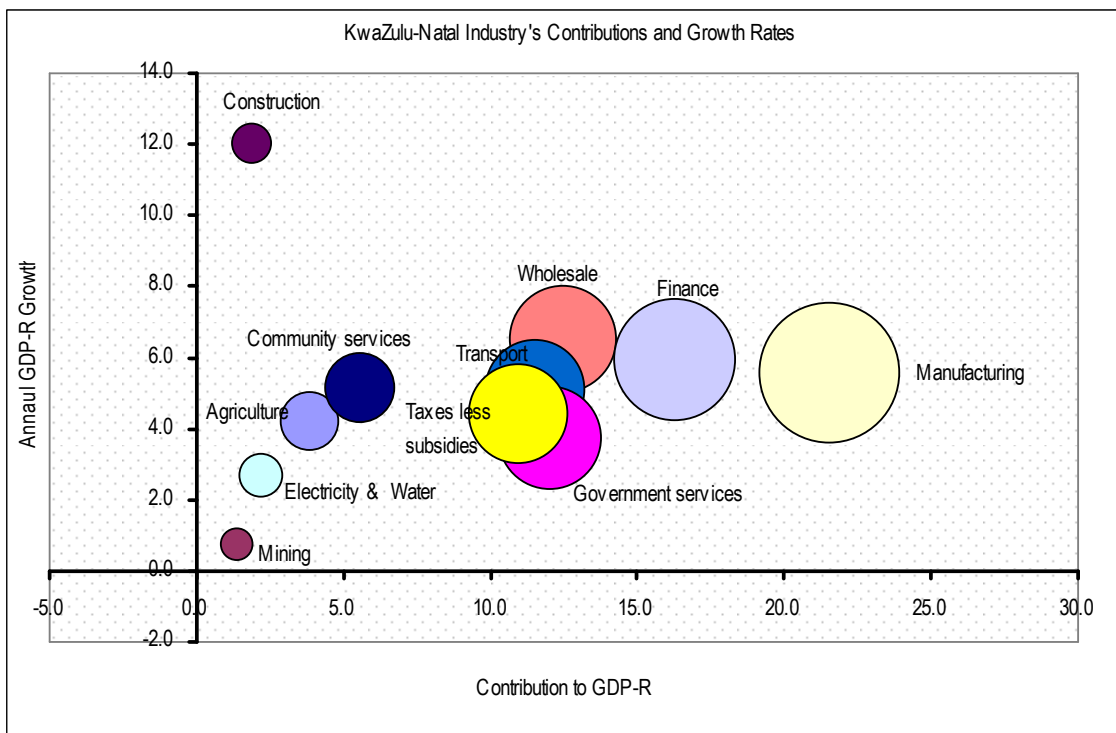
In 2005, the province's real Gross Domestic Product per Region (GDP-R) was estimated at R183, 4 billion. The GDP-R growth rate rose more than fivefold, from 1% in 1999 to 5.3% in 2005, which was the highest growth rate achieved in the province since 1995, and higher than the 2005 national GDP growth rate of 5.1% (Figure 7).

The fivefold GDP-R improvement suggests that the provincial economy has the potential to reach a 8% growth rate by the year 2014, which is far above the ASGI-SA's target of 6%. Since 1995, KwaZulu-Natal has remained the second highest contributor to the country's GDP (16.6%) and the province now needs to come up with realistic targets to aim for.

Given the current economic structure, and if the economy maintains its current performance trend, a 6% real GDP growth target seems feasible for 2006, well before the 2015 date suggested by ASGI-SA. However, other ASGI-SA goals related to poverty are still obstructed by the level of illiteracy and the rapidity of urbanisation in the Black community.

Figure 8 gives percentage contributions to the provincial GDP by the different sectors of the economy in 2005, and the rates at which these sectors grew between 2004 and 2005.

It is clear from this figure that although *Construction* is among the lowest in terms of contribution to the province's GDP-R, it grew the fastest in 2005 by 12%. *Manufacturing* made the biggest contribution to the KwaZulu-Natal economy (21.6%) but with low growth rate.

2.2 Labour market and sector productivity: a SAM perspective

One of the purposes of the SAM is to provide detailed information on the demand and supply in monetary terms of labour as employed in the production system. The role in the economy that people themselves play in the production of goods and services is a key ingredient of sustainable development. In the SAM, information on individuals may be broken down into various categories (e.g. occupational group and skill level) to give a detailed presentation of the labour market. The analysis in this section of the paper covers unemployment and employment patterns.

The unemployment rate in the province has fallen from 36.3% in 2003 to 29.9% in 2006. As previously mentioned, there were 9,9 million people living in the province in 2006. Of these, 6,1 million (61.2%) were in the working-age group (15-65 years; also referred to as the labour force), and of this 6,1 million labour force,

- 3,1 million (51.5%) were economically active
- 2,9 million (48.5%) were not economically active (for example, full-time students).
- Of the 3,1 million economically active population,
- 2,2 million (70.1%) were employed
- 0.9 million (29.9%) were unemployed (in terms of the official definition).
- Of the 2,9 million not economically active population,
- 2,1 million (71.9%) were not available to work (for example: full-time students)
- 0,8 million (28.1%) were discouraged work-seekers.

Employment pattern is a key determinant of household income and expenditure. The Social Accounting Matrix details the *Primary and the Secondary Distribution of Income* accounts (including both the *Generation of Income* and the *Allocation of*

Income accounts) which lead to the estimations of the *Disposable Income* and *Savings* accounts.

The SAM enables modelling of employment by skill levels (Table 5), employment by economic sector (Figure 9), and employment by occupation (Figure 10, Table 6 and Table 7) to determine their impact on the economy. The multipliers generated in the SAM also make it possible to simulate employment requirements (demand and supply) for the achievement of specific policy goals or objectives. This section of the paper provides background information regarding the structure of employment in KwaZulu-Natal.

As can be seen from Table 5, only 17% of the 2.2 million employed people are highly skilled, and 40% are skilled. With economic activity continuing to gravitate from the primary sector to the tertiary sector, the pressure to sustain international competitiveness raises demand for highly skilled labour in the tertiary sector where it is most needed. Equally, the high proportion of unskilled labour (more than 90%) in the agriculture sector might affect that sector's productivity and performance. The government sector, on the other hand, stands out as a sector with a high level of highly skilled labour (46%) and a low level of unskilled labour (10%).

Figure 9 indicates the top three employment sectors, employing more than half of total labour, as Manufacturing (20%), General government (18%), and Community and Social Services (17%). The smallest employment sectors, contributing less than 5% to total employment in the province, are Electricity (0.5%), Mining (1%), and Transport (3%).

Tables 6 and 7, and Figure 10 show how jobs are distributed by occupation group, population group and gender. With a provincial contribution of 16% to the National Gross Domestic Product, and 17.7% to national employment, KwaZulu-Natal has more than a quarter of the national total of skilled agricultural and fishery workers and 20.8 percent of the national total of domestic workers.

The distribution of KZN employment by occupation is very similar to that for South Africa as a whole. The largest occupational group (19% for RSA and 22% for KZN) is in the sector designated as "elementary occupation". Detailing occupation by gender, Table 7 interestingly reveals that gender balance has been reached only in the professional occupation group. Senior officials and managers, however, are still predominantly male (76%), perpetuating what are evidently strongly engrained societal attitudes, while agriculture and sales marketing workers are mostly female. The only occupation to date that seems monopolised by females is that of domestic workers, where gender and race statistics are strongly skewed towards Blacks and females. In South Africa and KwaZulu-Natal in particular, 99% of domestic workers are female. In northern African countries, contrastingly, domestic workers are mostly male. Employment analysis by occupation and by race shows that more than half (51.9%) of all male professionals in the province are Whites, compared to 32.7% for their black counterparts. Black females are predominantly (more than 99%) found to be involved in domestic and agriculture labour. The literature reveals that households headed by females in these two occupations are especially liable to be caught in the poverty trap.

Table 5: Employment by skill levels 2006

	Highly Skilled	Skilled	Semi/Unskilled	Total
Agriculture	3	6	92	100
Mining	5	16	79	100
Manufacturing	9	27	65	100
Electricity	23	34	43	100
Construction	6	18	75	100
Wholesale, Trade & Accommodation	12	67	21	100
Transport & Communication	9	63	28	100
Finance & Business	20	66	14	100
Community, social services	12	27	61	100
General Govt services	46	44	10	100
Total	**17**	**40**	**43**	**100**

Source: Provincial Treasury (2007), Statistic South Africa (2006).

Table 6: RSA and KZN employment by occupation 2006

Occupation Category	RSA	KZN	RSA (%)	KZN (%)	KZN/RSA (%)
Legislators, senior officials and managers	873,966	144,938	6.5	6.9	16.6
Professionals	616,877	92,142	4.1	4.9	14.9
Technical and associate professionals	1,187,178	212,868	9.5	9.4	17.9
Clerks	1,209,799	190,673	8.5	9.5	15.8
Service workers and market sales workers	1,582,415	274,724	12.3	12.5	17.4
Skilled agricultural and fishery workers	733,669	195,542	8.7	5.8	26.7
Craft and related trades workers	1,732,998	309,655	13.8	13.7	17.9
Plant and machine operators and assemblers	1,103,889	214,728	9.6	8.7	19.5
Elementary Occupation	2,786,574	426,326	19.0	22.0	15.3
Domestic workers	857,204	178,027	7.9	6.8	20.8
Total	**12,684,570**	**2,239,624**	100.0	100.0	17.7

Source: Quantec, 2006

Figure 9: Employment by economic sector 2005

Transport & Commun. 3%

Wholesale, Trade & Accomm. 16%

Finance & Business 13%

Construction 4%

Community & Social Services 17%

Manufacturing 20%

General Govt services 18%

Mining 1%

Agriculture 8%

Electricity 0%
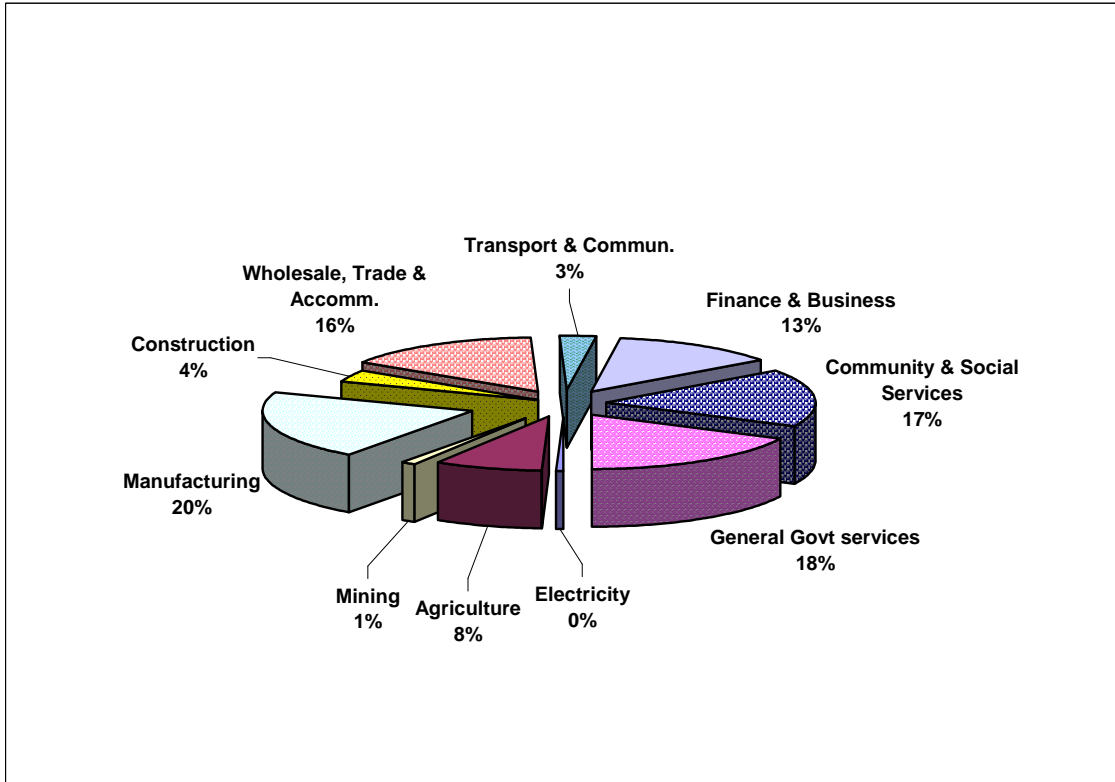
Source: Quantec, 2006

Figure 10: Employment by occupation 2005

Craft & related trades workers 13%

Service workers & market sales workers 13%

Skilled agricultural & fishery workers 6%

Plant & machine operators 9%

Clerks 10%

Technical & associate professionals 9%

Elementary Occupation 21%

Professionals 5%

Domestic workers 7%

Legislators, senior officials & managers 7%
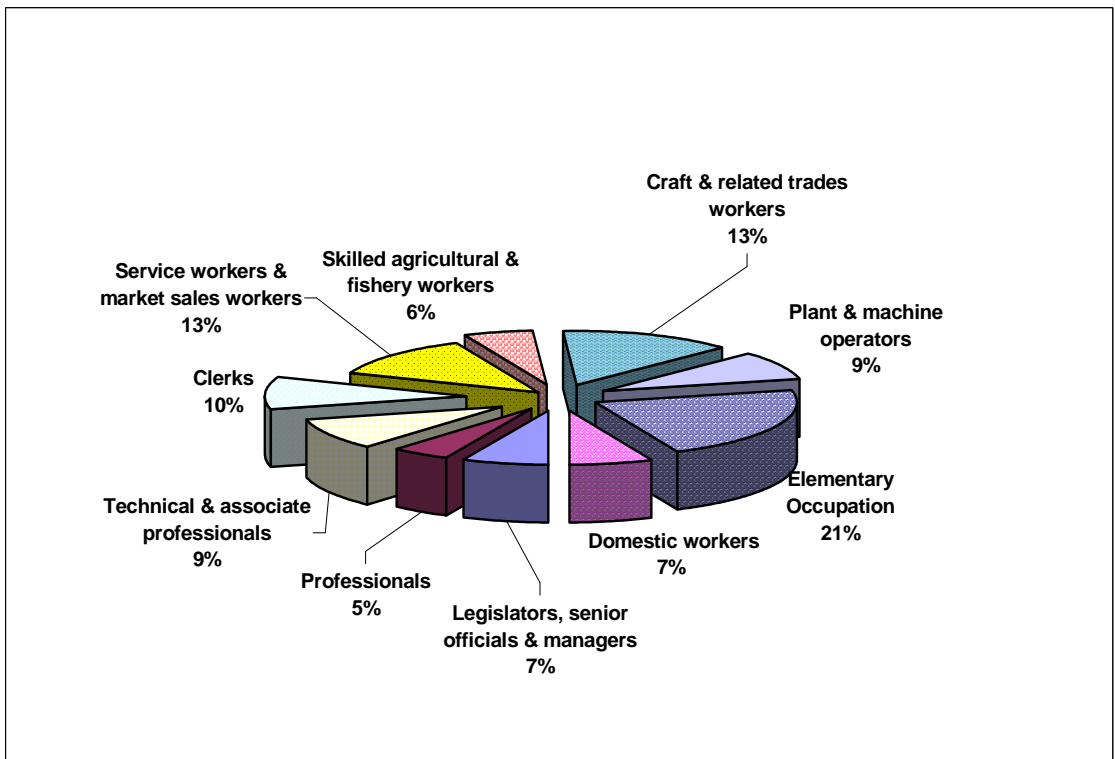
Source: Quantec, 2006

Table 7: KZN employment by occupation/race/gender 2005

Occupation	Race	Number		Distribution (% race)		Distribution (% Gender)		
		Male	Female	Male	Female	Male	Female	Total
Legislators, senior officials and managers	African/Black	31,433	9,980	29.3	26.6	76	24	100
	Coloured	7,857	1,887	7.3	5.0	81	19	100
	Indian/Asian	33,161	11,000	30.9	29.3	75	25	100
	White	34,898	14,723	32.5	39.2	70	30	100
	Total	*107,348*	*37,591*	*100.0*	*100.0*	*74*	*26*	*100*
Professionals	African/Black	15,177	17,861	32.7	39.1	46	54	100
	Coloured	1,791	2,155	3.9	4.7	45	55	100
	Indian/Asian	5,371	7,944	11.6	17.4	40	60	100
	White	24,130	17,713	51.9	38.8	58	42	100
	Total	*46,469*	*45,673*	*100.0*	*100.0*	*50*	*50*	*100*
Technical and associate professionals	African/Black	55,230	70,796	55.9	62.1	44	56	100
	Coloured	2,865	6,531	2.9	5.7	30	70	100
	Indian/Asian	28,126	13,016	28.5	11.4	68	32	100
	White	12,599	23,704	12.7	20.8	35	65	100
	Total	*98,821*	*114,048*	*100.0*	*100.0*	*46*	*54*	*100*
Clerks	African/Black	38,760	46,491	59.0	37.2	45	55	100
	Coloured	1,933	9,099	2.9	7.3	18	82	100
	Indian/Asian	21,725	36,624	33.1	29.3	37	63	100
	White	3,314	32,726	5.0	26.2	9	91	100
	Total	*65,732*	*124,940*	*100.0*	*100.0*	*34*	*66*	*100*
Service workers and shop and market sales workers	African/Black	134,926	74,803	76.9	75.4	64	36	100
	Coloured	1,605	4,077	0.9	4.1	28	72	100
	Indian/Asian	12,967	13,483	7.4	13.6	49	51	100
	White	25,996	6,867	14.8	6.9	79	21	100
	Total	*175,494*	*99,230*	*100.0*	*100.0*	*64*	*36*	*100*
Skilled agricultural and fishery workers	African/Black	60,255	131,714	95.2	99.6	31	69	100
	Coloured	-	-					100
	Indian/Asian	686	533	1.1	0.4	56	44	100
	White	2,354	-	3.7				100
	Total	*63,295*	*132,247*	*100.0*	*100.0*	*32*	*68*	*100*
Craft and related trades workers	African/Black	186,462	52,683	74.2	90.4	78	22	100
	Coloured	15,128	1,424	6.0	2.4	91	9	100
	Indian/Asian	33,852	4,177	13.5	7.2	89	11	100
	White	15,930	-	6.3				100
	Total	*251,371*	*58,283*	*100.0*	*100.0*	*81*	*19*	*100*
Plant and machine operators and assemblers	African/Black	130,170	36,066	77.4	77.5	78	22	100
	Coloured	-	1,777		3.8			100
	Indian/Asian	26,651	8,366	15.8	18.0	76	24	100
	White	11,384	314	6.8	0.7	97	3	100
	Total	*168,205*	*46,523*	*100.0*	*100.0*	*78*	*22*	*100*
Elementary Occupation	African/Black	195,842	191,586	90.3	91.4	51	49	100
	Coloured	1,503	2,465	0.7	1.2	38	62	100
	Indian/Asian	13,357	11,913	6.2	5.7	53	47	100
	White	6,102	3,559	2.8	1.7	63	37	100
	Total	*216,804*	*209,522*	*100.0*	*100.0*	*51*	*49*	*100*
Domestic workers	African/Black	2,539	174,354	100.0	99.4	1	99	100
	Coloured	-	789		0.4			100
	Indian/Asian	-	345		0.2			100
	White	-	-					100
	Total	*2,539*	*175,488*	*100.0*	*100.0*	*1*	*99*	*100*

Source: Quantec, 2006

The province of KwaZulu-Natal is home to 10 million people of whom just under 52% are female. Figure 11, which gives age distribution by gender, indicates the degree to which the population of both the province and the country is predominantly young.

Turning to income and expenditure of KwaZulu-Natal households, Table 8 and Figure 12 provide a trend analysis on total remuneration, current taxes on income, and saving by households, and show how disposable income is spent on durable, semi-durable and non-durable goods and on services.

Figure 12 shows the performance of household income and expenditure over the past decade. As income increases, consumption follows. Savings by households has been the most volatile variable. As households contract debt, the repayment of capital plus interest erodes savings. Table 8 shows that between 1995 and 2005, household current income grew by 38%. In 2005, it reached R118.6 billion of which

- 61% was remuneration
- 39% was unearned income.

In addition,

- 89% of the total was disposable income available for consumption
- 11% of the total was current taxes on income and wealth

Of the disposable income,

- 98% was consumed by households
- 2% was saved

Of total expenditure by household

- 50% was spent on food, transport, rent, clothing
- 50% was spent on other item listed in Table 7

Expenditure on food and beverages as a percentage of total expenditure fell from 30.1% in 1995 to 23.9% in 2005, probably due to new entrants into the middle income group whose spending is higher on transport and clothing.

Figure 11: Age distribution by gender 2006
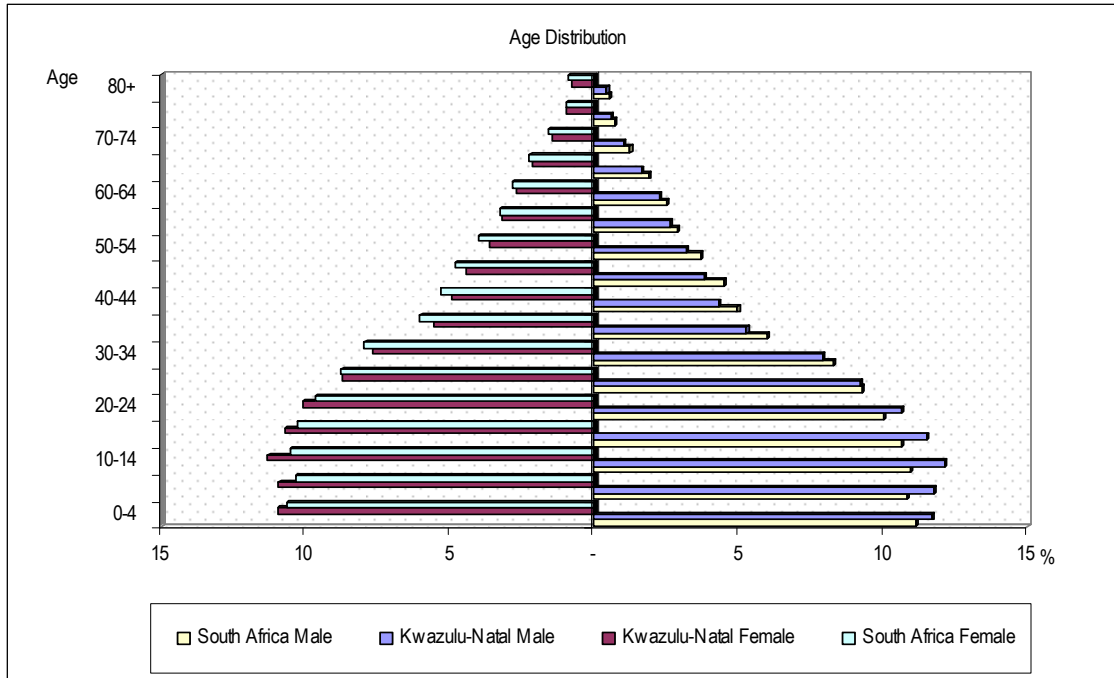
Source: Statistics South Africa

Figure 12: Growth in household income & expenditure
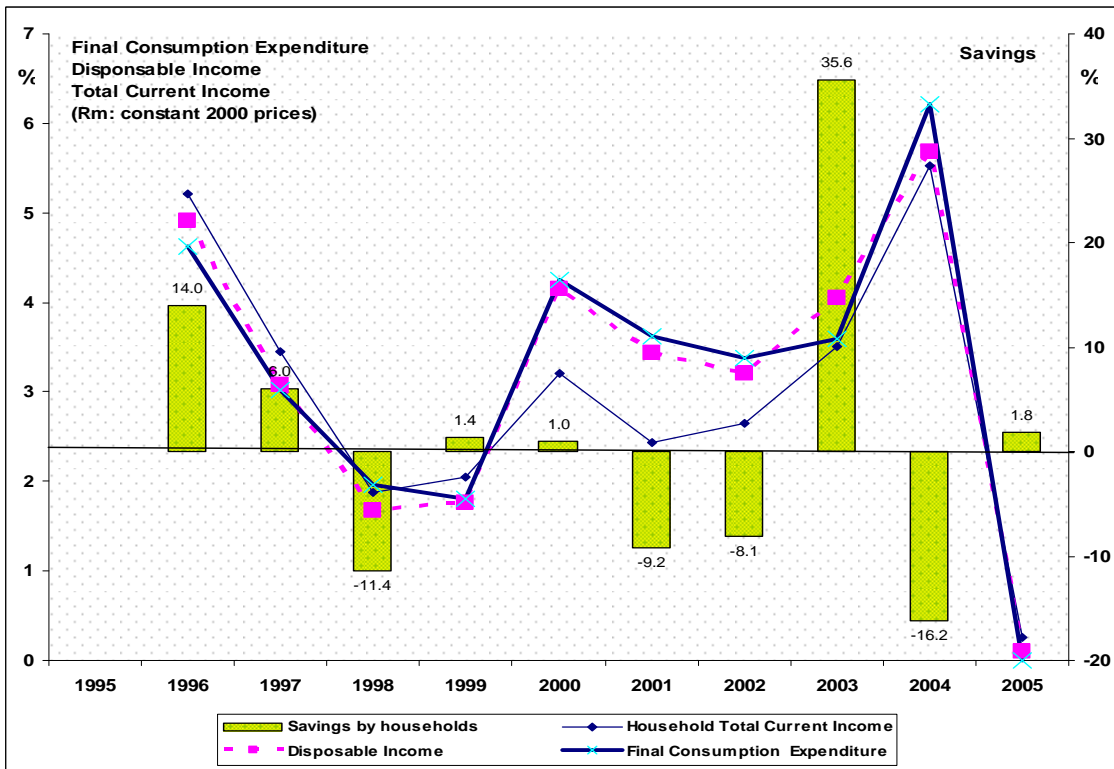
Source: Quantec, 2006, KwaZulu-Natal Provincial Treasury, 2007

Income and expenditure by KZN Household (Rmillion; constant 2000 Prices)	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
= Remuneration	58,712	61,584	62,635	64,201	64,987	65,726	66,319	66,307	69,442	72,673	72,128
+ Unearned income	29,544	31,245	33,393	33,635	34,878	37,289	39,263	41,991	42,626	45,720	46,543
= Current Income	88,256	92,829	96,027	97,836	99,865	103,015	105,582	108,297	112,067	118,392	118,671
- Current taxes on income and wealth	10,696	11,535	12,157	12,612	13,154	12,670	12,186	11,925	11,780	12,354	12,564
= Disposable income	77,560	81,294	83,870	85,224	86,711	90,345	93,396	96,373	100,288	106,039	106,108
- Saving by households	1,727	1,969	2,087	1,849	1,875	1,893	1,718	1,579	2,141	1,794	1,826
= Final Consumption Expenditure	75,832	79,325	81,783	83,375	84,836	88,452	91,678	94,793	98,147	104,244	104,281
Distribution of Total Disposable Income (%)	100	100	100	100	100	100	100	100	100	100	100
Saving by households	2.2	2.4	2.5	2.2	2.2	2.1	1.8	1.6	2.1	1.7	1.7
Durable goods: Furniture, household appliances	2.3	2.3	2.3	2.2	2.2	2.3	2.2	2.2	2.2	2.3	2.2
Durable goods: Personal transport equipment	5.2	5.4	5.1	4.2	3.9	4.3	4.5	4.2	4.3	4.8	4.2
Durable goods: Recreational and entertainment goods	0.9	0.9	0.9	1.0	1.1	1.2	1.3	1.4	1.6	1.9	1.8
Durable goods: Other durable goods	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7
Semi-durable goods: Clothing and footwear	5.1	5.2	5.2	5.8	5.7	6.1	6.3	6.9	7.1	7.7	7.6
Semi-durable goods: Household textiles, furnishings, gl	1.7	1.7	1.7	1.6	1.7	1.7	1.7	1.7	1.8	1.9	1.8
Semi-durable goods: Motor car tyres, parts and access	1.3	1.4	1.3	1.3	1.2	1.3	1.2	1.2	1.2	1.2	1.2
Semi-durable goods: Recreational and entertainment g	0.9	0.8	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.1
Semi-durable goods: Miscellaneous goods	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4
Non-durable goods: Food, beverages and tobacco	30.1	29.7	29.8	29.1	27.8	26.4	26.1	25.8	24.9	24.3	23.9
Non-durable goods: Household fuel and power	3.3	3.2	3.2	3.4	3.4	3.3	3.3	3.3	3.3	3.2	3.3
Non-durable goods: Household consumer goods	3.6	3.4	3.3	3.7	3.8	3.8	3.7	3.7	3.7	3.7	3.8
Non-durable goods: Medical and pharmaceutical produ	1.4	1.4	1.4	1.3	1.3	1.2	1.2	1.2	1.2	1.1	1.1
Non-durable goods: Petroleum products	4.0	4.1	4.0	3.8	3.7	3.4	3.3	3.2	3.1	3.1	2.9
Non-durable goods: Recreational and entertainment go	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Services: Rent	9.9	9.7	9.6	9.6	9.5	9.2	9.0	8.8	8.6	8.4	8.5
Services: Household services, including domestic serva	3.2	3.1	3.1	3.2	3.1	3.0	3.0	3.0	3.1	3.0	3.0
Services: Medical services	4.5	4.5	4.6	4.5	4.8	5.3	5.8	6.0	6.2	6.1	6.4
Services: Transport and communication services	7.2	7.3	7.5	7.6	8.1	8.6	9.0	9.6	9.7	9.7	10.1
Services: Recreational, entertainment and educational s	3.1	3.0	2.9	3.9	4.1	4.4	4.4	4.4	4.2	4.1	4.6
Services: Miscellaneous services	8.1	8.5	8.9	8.7	9.3	9.3	9.2	8.8	8.7	8.7	9.0

3 Theoretical foundation of SAMs: Methodology and data sources

3.1 Definition, structure of a SAM, and how the SAM was constructed

A SAM provides a comprehensive and consistent description of transactions taking place in an economy during a specified period of time, generally one year. It is a square matrix that describes quantitatively the transactions that occurred between the production sector, factors, private (households), public (government) institutions and the rest of the world. Each transaction in the SAM is represented by a column and row, with columns tracking expenditures and rows tracking incomes. SAMs follow the two leading principles of double-entry accounting: (i) purchases, expenditures or financial outlay by one account constitute a sale, income or financial inflow to one or more other accounts; (ii) for each account, total income must equal total expenditure.

3.1.1 Definition of the SAM

The 1993 United Nations System of National Accounts (SNA) defines a SAM as the presentation of SNA accounts in a matrix which elaborates the linkages between a supply and use table and institutional sector accounts. In many instances SAMs have been applied to an analysis of interrelationships between structural features of an economy and the distribution of income and expenditure among household groups.

Value *T* is defined as the matrix of SAM transactions with elements *Ti,j* representing payment from column account *j* to row account *i*. Following the conventions of double-entry bookkeeping, the total receipts (income) and expenditure of each actor must balance. That is, for a SAM, every row sum must equal the corresponding column sum:

$$y_1 = \sum_j T_{i.j} = \sum_J T_{j.i} \tag{1}$$

where y is total receipts and expenditures of account i.

A SAM coefficient matrix, *A*, is constructed from *T* by dividing the entries in each column of *T* by the column sums:

$$A_{i.j} = \frac{T_{i.j}}{y_j} \tag{2}$$

By definition, all the column sums of *A* must equal to 1, so the matrix is singular. Since column sums must equal row sums, it also follows that (in matrix notation):

$$y = Ay \tag{3}$$

3.1.2 Structure, and how the SAM was constructed.

How was the KZN SAM constructed? The first step was to compile the main accounts referred to in the 1993 SNA as *Integrated Economic Accounts* (Table 9). At provincial level, it was not necessary to include the balance sheet accounts. The following major economic accounts prescribed by the 1993 SNA were included:

- Goods and services account
- Production account
- Capital account
- Rest of the world account.

These main economic accounts comprise sub-accounts whose totals and balancing items feed into the aggregated SAM or Macro SAM.

The second step, therefore, was to compile a Macro SAM. The structure of a Macro SAM as prescribed by the 1993 United Nations SNA (93 SNA) is presented in Table 10. The Macro SAM is the highest level of aggregation of the National (Regional) Accounts Matrix, also referred as NAM (or regionally, as RAM). It shows how the supply and use tables (rows and columns 1 and 2), the distribution and use of income accounts (rows and columns 3 to 6), the accumulation accounts (rows and columns 7 to 9), and the rest of the world accounts (rows and columns 10 and 11) can now be presented in a matrix format (Table 10); i.e. moving from presentation in the form of a **T** account format (Table 9) to a Matrix format (Table 10). The integrated economic accounts in Table 9 are comprised of the goods and services accounts and the production accounts which were compiled for the construction of the SU-Tables

The third step was to disaggregate the Macro SAM in order to produce a detailed SAM known as the Micro SAM. In other words, a Micro SAM[2] is derived from the Macro SAM. It expands the individual cells to show the kind of transactions between the different socio-economic actors. The disaggregated SAM is highly data-intensive and requires integration of data collected by many different agencies, often collected for different purposes and not always directly compatible. Compatibility, estimation, and balancing present much stiffer challenges in the case of a regional SAM than they do for a national SAM.

Various techniques are used to develop both the Macro SAM and the Micro SAM. These techniques, namely top-down and bottom-up, and cross-entropy are explained in section 3.2.2.

Moving from one step to the next, it is important to ensure that accounts and/or matrices balance. In cases where the SAM developer has existing matrices/accounts for previous years, these need to be updated and then balanced with the new set of accounts/matrices.

The last step in developing the KZN SAM was therefore to balance all the matrices. Updating and/or balancing a matrix requires the use of RAS and Entropy techniques (Section 3.2.2).

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[2] The format of this Micro SAM is found in SNA93, (ISWG, 1993) and Prgs.8.133 – 8.155 of ESA 95, (Eurostat, 1996) and in work done by Graham Pyatt and his associates (Pyatt, 1988 and 1991; Pyatt and Roe, 1977; Pyatt and Round, 1985).

Table 9: List of integrated economic accounts

	INTEGRATED ECONOMIC ACCOUNTS		
	Transaction accounts		
0	Goods and services account		
	Full sequence of accounts for institutional sectors		
Current accounts			
I	Production account	B.1	Value added
II.I	Primary distribution of income account		
II.1.1	Generation of income account	B.2/3	Operating surplus / mixed income
II.1.2	Allocation of primary income account	B.5	Balance of primary incomes
II.2	Secondary distribution of income account	B.6	Disposable income
II.3	Redistribution of income in kind account	B.7	Adjusted disposable income
II.4	Use of income account		
II.4.1	Use of disposable income account	B.8	Saving
II.4.2	Use of adjusted disposable income account	B.8	Saving
Accumulation accounts			
III.1	Capital account	B.9	Net lending / net borrowing
III.2	Financial account	B.9	Net lending / net borrowing
III.3	Other changes in assets account	B.10	Other changes in net worth
Balance sheets			
IV.1	Opening balance sheet	B.90	Net worth
IV.2	Changes in balance sheet	B.10	Total changes in net worth
IV.3	Closing balance sheet	B.90	Net worth
	Rest of the world account		
Current accounts			
V.I	External account of goods and services	B.11	External balance of goods and services
V.II	External account of primary income and current transfers	B.12	Current external balance
Accumulation accounts			
V.III.1	External capital account	B.9	Net lending / net borrowing
V.III.2	External financial account	B.9	Net lending / net borrowing
V.III.3	External account for other changes in assets		
	Balance sheets		
V.IV.1	External opening balance sheet	B.90	Net external financial position of the nation
V.IV.2	External changes in balance sheet	B.10	Changes in net external financial position of the nation
V.IV.3	External closing balance sheet	B.90	Net external financial position of the nation

Source: United Nations 1993 SNA

Source: 93 SNA

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Integrated Economic Account (classification)	Codes	Goods and Services (products) 1	Production (industries) 2	Generation of Income (Value Added Categories) 3	Allocation of Primary Income (institutional sectors) 4	Secondary Distribution of Income (institutional sectors) 5	Use of Income (institutional secotors) 6	Capital (institutional sectors) 7	Fixed Capital Formation (industries) 8	Financial (financial assets) 9	Rest of the World Current 10	Rest of the World Capital 11	TOTAL 12
Goods and Services (products)	1	Trade & Transport Margins	Intermediate Consumption				Final Consumption Expenditure	Changes in Inventories /1	Gross Fixed Capital Formation		Exports of Goods and Services		Ta
Production (industries)	2	Output											Tb
Generation of Income (Value Added Categories)	3		Net Value Added, at basic prices								Compensation of employees from ROW		Tc
Allocation of Primary Income (institutional sectors)	4	Taxes less subsidies on products		Net Generated Income at basic prices	Property Income						Property Income and Taxes less subsidies on prod. from ROW		Td
Secondary Distribution of Income (institutional sectors)	5				Net National Income	Current Taxes on Income, Wealth, etc and curr. transfers					Current Taxes on Income etc and current transfers from ROW		Te
Use of Income (institutional sectors)	6					Net Disposable Income	Adj. for change in net equity households on pension funds				Adj. for change in net equity hh. On pension funds frim ROW		Tf
Capital (institutional sectors)	7						Net savings	Capital Transfers /2		Borrowing		Capital Transfers from ROW 2/	Tg
Fixed Capital Fromation (industries)	8		Consumption of Fixed Capital					Net Fixed Capital Formation					Th
Financial (financial assets)	9							Lending				Net lending of ROW	Ti
Rest of the World, Current	10	Imports of Goods and Services		Compensation of Employees to ROW	Property Income and Taxes less subsidies on prod to ROW	Current Taxes on Income, etc. and curr. Transf. to ROW	Adj. for Change in Net Equity H.H on pension funds to ROW						Tj
Rest of the World, Capital	11							Capital Transfers to ROW			Current External Balance		Tk
TOTAL	12	Ta	Tb	Tc	Td	Te	Tf	Tg	Th	Ti	Tj	Tk	

3.2 Methodology and data sources

In this section we indicate the main data sources used to construct the SAM and we describe various techniques used to develop a SAM. The discussion centres firstly on the methodology of top-down and bottom-up approaches in constructing a SAM, followed by the cross-entropy approach used in estimating and balancing a SAM, and the RAS approach used in updating and balancing the SAM.

3.2.1 Main data sources

In most countries, the important data sources for constructing a SAM are:

Supply and Use Tables: The SUT provides information on production of goods and services, intermediate consumption expenditure, imports and exports, taxes, and subsidies. The data on the components of final demand (household, government, gross fixed capital formation, etc.), and the components of gross value added (compensation of employee, gross operating surplus, etc.) are also provided in the SUT.

Census data: The census provides demographic data on population by race, gender, age, and the urban-rural split.

Household survey data: The household survey provides the income and expenditure pattern of households. Data collected includes household expenditure on durables, semi-durables, and non-durables, and household income and savings.

Labour survey data: The labour survey relates to employment and earnings of both employees and employers. The data collected for formal and informal employment includes the number of people employed, the compensation of employees per sector, occupation, age, race, and gender.

3.2.2 Techniques in constructing a SAM

In developing a Social Accounting Matrix, a choice must be made between a top-down approach and bottom-up approach. The cross-entropy and RAS methods are used to estimate, update and balance the SAM.

(I) The top-down approach

This approach takes macroeconomic totals from the national accounts for industry production, intermediate consumption expenditure, final demand, etc., and uses them as the row and column sums of the SAM. The challenge then is to disaggregate the rows and columns so that they match the sums. The top-down approach depends on the following important assumptions: accuracy of the control totals from the national accounts (or other sources), and accuracy of the external data used for distribution of row and column totals. The accuracy of both sets of factors can vary enormously across different components of the SAM. Regarding control totals, national accounts totals for the output of activities like the mining industry may be quite accurate when only a few large companies are involved because it is relatively easy to measure the volume and value of output. On the other hand the output of transportation services or business services is likely to be much more difficult to measure because the physical output is not always well defined and these services are provided by many small operators, making surveys expensive. Hence these column totals may not be very accurate.

(II) The bottom-up approach

The bottom-up approach to constructing a SAM draws more extensively on primary data and undertakes adjustment of inconsistencies by further research

into all data for the SAM rather than a mechanical balancing. In this approach, one returns to the primary data from which the national accounts were constructed to review its accuracy. In addition, new data may be collected. If the new data are considered more reliable or more comprehensive, all the figures from the national accounts may be adjusted to be consistent with the new data. Inconsistencies are tackled by undertaking further research into a sector to resolve the discrepancies rather than simply adjusting them by means of a mechanical balancing tool. This approach is preferable where there are large discrepancies between the primary data and the national accounts. The advantages of the Bottom-up Approach are that the SAM shows a better representation of the real economy, inconsistencies can be identified and resolved, and national accounts can be improved by researching inconsistencies Small remaining discrepancies can be resolved by routine balancing methods.

(III) The Cross-entropy approach to SAM estimation

As discussed in the previous section, the disaggregated SAM is highly data-intensive. Statistics are collected from various agencies which will often have gathered data for a variety of purposes, so that it is no surprise when the resulting micro-SAM is not balanced. The largest discrepancies are found in the household accounts, due to the assumptions that have been necessary to spread the various incomes, transfers and expenditures of households. The main challenges SAM developers experience is that the data are incompatible, inconsistent, and/or non-existent (especially at provincial and local levels). In addition, there will typically be measurement errors, and there will certainly be some data entries that the SAM developer finds more reliable than others. For these reasons, an appropriate solution for balancing the Micro SAM is to adopt the cross-entropy approach, which allows these factors to be taken into account when estimating and balancing the SAM.

Entropy technique is a method of solving underdetermined estimation problems. The problem is underdetermined because for an *n* x *n* matrix we are seeking to identify *n2* unknown, non-negative parameters, i.e. the cells of the SAM. However, there are only *2n-1* independent row and column adding-up restrictions. In other words, restrictions must be imposed on the estimation problem so that we have enough information to obtain a unique solution and to provide enough degrees of freedom. The underlying philosophy of entropy estimation is to use *all* and *only* the information available for the problem at hand: the estimation procedure should not ignore any available information nor should it add any false information. In the case of SAM estimation, two situations are possible. Firstly, 'information' may be the knowledge that there is measurement error concerning the variables, and that some parts of the SAM are known with more certainty than others. Secondly, there may be a prior in the form of a SAM from a previous year, in which case the entropy problem is to estimate a new set of coefficients 'close' to the prior using new information to update it.

For illustration purposes, let the SAM be defined as a matrix **T** with elements *Ti,j* representing a payment from the column account *j* to the row account *i.* Following the conventions of double-entry bookkeeping, the total receipts (row sum *yi*) and the total expenditure (column sum *yj*) in the SAM must balance.

From Equation 2 ($A_{ij} = \dfrac{T_{i,j}}{Y_i}$) and Equation 3 (y = Ay), and assuming that the entropy problem starts with a prior (*A)* which is an unbalanced SAM, (*A)* represents the starting point from which the cross-entropy balancing procedure departs in deriving the new matrix of coefficients *A**. The entropy problem is to find a new set of *A* coefficients which minimize the so-called 'cross entropy'

distance measured between the prior *A* and the new estimated coefficient matrix *A**.

$$\text{Min} \left[\sum_i \sum_j A_{i.j} \ln \frac{A_{i.j}}{\overline{A}_{i.j}} \right] = \left[\sum_i \sum_j A_{i.j} \ln A_{i.j} - \sum_i \sum_j A_{i.j} \ln \overline{A}_{i.j} \right] \tag{4}$$

Subject to $\sum_j A_{i.j} y_j^\bullet = y_i^\bullet$ and $\tag{5}$

$$\sum_j A_{j.i} = 1 \tag{6}$$

$$0 \le A_{j.i} \le 1$$

The solution is obtained by setting up the Lagrangian for the above problem and solving it. The outcome combines the information from the data and the prior:

$$A_{ij} = \frac{\overline{A}_{ij} \exp(\lambda_i y_j^\bullet)}{\sum_{i,j} \overline{A}_{ij} \exp(\lambda_i y_j^\bullet)} \tag{7}$$

where λ are the Lagrange multipliers associated with the information on row and column sums, and the denominator is a normalization factor.

The expression is analogous to Bayes' Theorem, whereby the posterior distribution (A_{ij}) is equal to the product of the prior distribution ($\overline{A}_{ij}$) and the likelihood function (probability of drawing the data given parameters we are estimating), divided by a normalization factor to convert relative probabilities into absolute ones. The analogy with Bayesian estimation is that the approach can be seen as an efficient Information Processing Rule whereby we use additional information to revise an initial set of estimates. Three types of information come into play:

- *Priors*: The matrix from an earlier year provides information about the new coefficients. The approach is to estimate a new set of coefficients "close" to the prior.
- *Moment Constraints*: The most common kind of information to have is data on some or all of the row and column sums of the new SAM. This knowledge can be incorporated easily in the cross-entropy framework by imposing a fixed value on y* in equation (6)
- *Economic Aggregates*: In addition to row and column sums, one often has additional knowledge about the new SAM. For example, aggregate national accounts data may be available for various macro aggregates such as value added, consumption, investment, government, exports, and imports. There also may be information about some of the SAM accounts such as government receipts and expenditures. This information can be summarized as additional linear adding-up constraints on various elements of the SAM.

For illustration purposes, let consider an *n-by-n* aggregator matrix *G* which has ones for cells in the aggregate and zeros otherwise. Let γ be the value of the aggregate. Assume that there are *k* such aggregation constraints, which are given by:

$$\sum_i \sum_j G_{i.j}^{(k)} T_{i.j} = \gamma^{(k)} \tag{8}$$

These conditions are simply added to the constraint set in the cross-entropy formulation. The conditions are linear in the coefficients and can be seen as additional moment constraints[3].

The cross-entropy problem can also be formulated as an "error-in-variables" system where the independent variables are measured with noise, in this case also referred to as a stochastic approach.

Stochastic Approach (Measurement Error): It is important to know that most applications of economic models to real world issues must deal with the problem of extracting results *with* noise, from data or economic relationships. In this section we generalize our approach to cases where: (i) row and column sums are not fixed parameters but involve errors in measurement, and (ii) the initial estimate, $\bar{A}$ is not based on a balanced SAM.

Assuming a standard regression model where β is the coefficient vector to be estimated, *Y* the vector of dependent variables, *X* the independent variables, and *e* the error term, the regression equation can be written as:

$$Y = X\beta + \ell \tag{9}$$

Extend the cross-entropy criterion to include an "errors in variables" formulation where the independent variables are assumed to be measured with noise as opposed to the "errors in equations" specification, where the process is assumed to include random noise. It is possible to rewrite the SAM equation (Equation 3) and the row/column sum consistency constraints as:

$$y = A[\bar{x} + e] = A\bar{x} + Ae \tag{10}$$
$$y = \bar{x} + e \tag{11}$$

where *y* is the vector of row sums and *x*, measured with error *e,* is the initial known vector of column sums. This error term can be rewritten as a weighted average of known constants *v:*

$$e_i = \sum_w W_{i.w} \bar{v}_{i.w} \tag{12}$$

Subject to the weights summing to one, i.e. w, the set of weights that fulfil the following constraints,

$$\sum_w W_{i.w} = 1 \tag{13}$$
$$\text{and} \qquad 0 \le W_{i.w} \le 1 \tag{14}$$

In the estimation, the weights are treated as probabilities in order to be estimated. The constants *v* define the "support" set for the errors and are usually chosen to yield a symmetric distribution with moments depending on the number of elements in the set *w*. In this case the variance is fixed. In general, one can add more *v*'s and *W*'s to incorporate more information about the error distribution. For example, if the error distribution is assumed to be rectangular and symmetric around zero, with known upper and lower bounds, the error equation becomes

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[3] *Inequality Constraints*: While one may not have exact knowledge about values for various aggregates, including row and column sums, it may be possible to put bounds on some of these aggregates. Such bounds are easily incorporated by specifying inequality constraints in equations (6) and (8).

$$e_i = W_i \bar{v}_i - (1 - W_i)\bar{\bar{v}}_i \tag{15}$$

Considering the terminals of the errors, the problem of minimization arises in the following form (moreover, the equation $y = \bar{x} + e$ replaces the equation $y = Ay$):

$$\underset{\{A,w:\bar{A}\}}{Min\ I} = \left[\sum_i \sum_j A_{i,j} \ln A_{i,j} - \sum_i \sum_j A_{i,j} \ln \bar{A}_{i,j} + \sum_i \sum_w w_{i,w} \ln w_{i,w} \right] \tag{16}$$

Subject to
$$\sum_j A_{i,j} \bar{X}_j + \sum_j A_{i,j} e_j = y_i^* \tag{17}$$

$$e_i = \sum_w w_{i,w} \bar{v}_{i,w} \tag{18}$$

$$\sum_w w_{i,w} = 1 \quad \text{and} \tag{19}$$

$$0 \le w_{i,w} \le 1 \tag{20}$$

$$\sum_j A_{j,i} = 1 \quad \text{and} \tag{21}$$

$$0 \le A_{j,i} \le 1 \tag{22}$$

The equation of the SAM (Equation 3) is non-linear, because of the product of A and e. The objective of the problem of minimisation is to find the whole of A and w which minimises the "Cross-Entropy" including the terms or errors (n is the number of elements of the unit w):

$$\underset{\{A,w:\bar{A}\}}{Min\ I} = \left[\sum_i \sum_j A_{i,j} \ln A_{i,j} - \sum_i \sum_j A_{i,j} \ln \bar{A}_{i,j} \right] + $$
$$\left[\sum_i \sum_w w_{i,w} \ln w_{i,w} - \sum_i \sum_w w_{i,w} \ln \frac{1}{n} \right]$$

It should be noted that the macros aggregated (which represent constraints in the problem of estimates) can be also measured with errors, like the sums in line and column. In order to detect them, we consider two sets of weight in distinguishing between the weights w_1 for the weight and errors in the sum in columns, and the weight w_2 for the errors of macro aggregates. Now the problem of the optimisation in the formulation "of the errors of variables" is to find the variables A, w_1 and w_2 which minimises "Cross-Entropy" measurements including the terms of the weights of the errors:

$$\underset{\{A,w1:w2\}}{Min\ I} = \left[\sum_i \sum_j A_{i,j} \ln A_{i,j} - \sum_i \sum_j A_{i,j} \ln \bar{A} \right] + $$
$$\left[\sum_i \sum_w w1_{i,w} \ln w_{i,w} - \sum_i \sum_w w1_{i,w} \ln \bar{w}_{i,j} \right] + $$
$$\left[\sum_i \sum_w w1_{i,w} \ln w_{i,w} - \sum_i \sum_w w1_{i,w} \ln \bar{w}_{i,j} \right] \tag{23}$$

Having detailed the methods of estimating and constructing the SAM, we now need to look at how to update a SAM.

(IV) The RAS approach to updating the SAM

There are several ways of balancing inconsistent SAM (or any other matrices). One approach is to use the RAS technique. This approach is typically used for updating SAMs for which new row and column sums are known. The RAS technique produces a new transaction matrix that is consistent with the new row and column sums by interactively adjusting the row and column entries proportionately until the new totals are obtained. This approach has several drawbacks – particularly when dealing with social accounting matrices for developing counties. First of all, the RAS technique assumes that the initial SAM is consistent and that there is no measurement error in the row and column sums. Secondly, the only information imposed on the RAS procedure is the row and column sums. Given y* (the known row and column sums) one needs to find a new SAM coefficient matrix $A*$ that is in some sense "close" to an existing coefficient matrix $\overline{A}$ but yields a SAM transactions matrix $T^{\bullet}$ with the new row and column sums. That is:

$$T^{\bullet}_{i.j} = A^{\bullet}_{i.j} y^{\bullet}_{j} \tag{24}$$

$$\sum_{j} T^{\bullet}_{i.j} = \sum_{J} T^{\bullet}_{j.i} = y^{\bullet}_{i} \tag{25}$$

A classic approach to solving this problem is to generate a new matrix $A*$ from the old matrix A by means of "bi-proportional" row and column operations:

$$A^{\bullet}_{i.j} = R_{i} \overline{A}_{i.j} S_{j} \tag{26}$$

written in matrix terms:

$$A^{\bullet} = \hat{R} \overline{A} \hat{S} \tag{27}$$

where the hat indicates a diagonal matrix of elements of *R* and *S*. This "RAS" method works in that a unique set exists of positive multipliers (normalized) which satisfies the bi-proportionality condition and in that the elements of *R* and *S* can be found by a simple iterative procedure.

We have dealt at length with the theoretical aspects of developing a SAM in order to give the reader better insight into the practical steps followed in developing the KZN SAM. In Section 4 we go on to consider how the theoretical issues indicated in Section 3 are linked to the practical aspects of developing a SAM.

4 Preliminary KZN Social Accounting Matrix, 2005

4.1 Background

4.1.1 The SAM and its development

The SAM's particular method of accounting for economic activity dates back to a number of different sources, starting with F. Quesnay's "tableau économique" (18th century). Sir Richard Stone pioneered the development of the SAM framework with his 1954 article "Input-Output and the Social Accounts," working on it for over four decades. The general shape of a SAM framework was first described by Pyatt and Thorbecke (1976). Subsequently Pyatt and Roe (1977) published a detailed description using the example of Sri Lanka. Since then SAMs have been applied in a wide variety of developed and developing countries and regions, and with a wide variety of different goals. SAMs have been used to study income distribution and redistribution (e.g. Pyatt and Roe, 1977; and Keuning, 1996), regional development (e.g. Cardenete, 2004), growth strategies in developing economies (e.g. Pyatt and Round, 1985; Robinson, 1986; and Vos and Jong, 2003), decomposition of activity multipliers that shed light on the circuits comprising the circular flow of income (e.g. Stone, 1981; Pyatt and Round, 1985; and Santos, 2004), and a variety of other social, technological/environmental and economic issues (e.g. Resosudarmo and Thorbecke, 1996; Khan, 1997; Duchin1, 1998; and Alarcón and others, 2000).

4.1.2 From National SAM to Regional SAM

Social Accounting Matrices (SAMs) are a system of social accounts which trace the flows of money throughout an economy. Regional SAMs offer a comprehensive, economy-wide database using a double-entry bookkeeping approach to present the data in a matrix format. Regional SAMs for policy analysis were developed over twenty years ago with the aim of providing both a descriptive and prescriptive analysis of a regional economy (Fannin, 2001). They consist of a matrix, made up of rows and columns which represent various sectors of the economy through which the flows of money into and out of the regional economy can be traced. They differ from Input Output models in that they show more detailed interrelations between sectors of the economy and they capture entire circular flows of income (Fannin[I], 2003).

Policy analysts use them to measure impacts, make predictions and examine the links between social and economic development (Allen 1998). SAMs were initially developed at a national level, but are now also used to analyse regional and local economies. Basically, the construction of matrices enables econometric analysis (of various sectors of the economy) in a form which is particularly helpful for the posing of specific policy questions about the economy through the development of "policy scenarios".

They offer a useful tool to regional policy analysts, but are limited in terms of the enormous data requirements and are most effective if integrated into a system of comprehensive regional policy. The main drawback with SAMs is their huge data requirements, as in order to build them it is necessary to have access to large volumes of data on the macro and micro economy. Sources of data can be both primary and secondary and in some cases participatory action research can be used to collect data at the local level. Generally they require a large amount of statistical data, but in cases where certain data is missing it may be possible to reduce the scope of the SAM through some data aggregation and alternative

sources of data (Allen 1998). The problem of using a variety of sources of data is that they may cover different time periods and spatial zones, so one needs to update these data using statistical and econometric techniques.

The construction of regional SAMs is more complicated than that of national SAMs because of data limitations at the provincial level. Given the degree of provincial specificity, Regional Integrated Economic Accounts need to be compiled following the United Nations System of National Accounts guideline.

4.1.3 South African SAM and the 1993 SNA

In South Africa, Statistics South Africa (Stats SA) and the South African Reserve Bank (SARB) are the official institutions responsible for compiling the National Accounts and implementing the 1993 System of National Accounts (1993 SNA). In 1999 Stats SA and SARB implemented the 1993 SNA in conjunction with rebasing and benchmarking gross domestic product (GDP) estimates.

Stats SA compiled the first official Supply and Use tables (SU-tables) for South Africa for the 1993 reference year according to the recommendations of the 1993 SNA and published them in December 1999. Subsequently, the SU-Tables have been published on an annual basis. As an extension of the implementation of the 1993 SNA, Stats SA also compiled a SAM for the 1998 reference year. The previous SAM compiled for South Africa by Stats SA was for the 1988 reference year and according to the 1968 SNA. Moving on from the 68 SNA, Stats SA has to date compiled two SAMs based on 93 SNA: the 1998 SAM was published in December 2002, and the 2002 SAM in 2005. Both of these focused on households and contained useful information that can be used in the analysis of poverty and income distribution.

The scope of these National SAMs is as follows:

- 27 Industries
- 4 Institutions
- 11 occupation groups
- 4 skills
- 4 races
- gender dimension included in external matrix
- Urban rural dimension included in external matrix
- 6 components of final demand
- 12 income groups

4.2 The KwaZulu-Natal SAM

In 2004, Provincial Treasury developed its first KwaZulu-Natal SU-Tables for 2001 reference year. A regional economic model was constructed based on the SU-Tables (20 by 20 matrix). Subsequently, these SU-Tables were updated to 30 by 30 matrix for the 2004 and 2005 reference years. This KZN SAM (2005) is an extension of the KZN SU-Table (2005) compiled in line with the United Nations 93 SNA and thus with international best practices. This is a preliminary SAM that could still need a few refinements. It focuses on household income distribution, and thus provides policy analysts with useful information for analysing (1) income inequality, (2) employment inequality, and (3) patterns of poverty in the province. The scope of this Regional SAM is similar to that of the National SAM.

4.2.1. Scope of the KZN SAM

The scope of the KwaZulu-Natal SAM is as follows (Figure 12):

- 30 Industries (Table 14)
- 4 Institutions (Table 11)
- 10 occupation groups linked to skill levels (Table 12)
- 4 skills levels
- 4 races linked to occupation and income groups
- gender dimension (external matrix)
- 6 components of final demand
- 12 Income groups – Percentiles calculated on total household expenditure (Table 13).

Due to poor quality of data, the following dimensions[4] were excluded from the matrixes:

- Rural and urban dimension
- Age distribution
- Formal and informal dimension.

We turn now to consider in more detail the content and the scope of the SAM. Table 11 details the institutions used in the KZN SAM.

An institutional unit is defined here as an economic entity capable, in its own right, of owning assets, incurring liabilities and engaging in economic transactions with other entities. Either a complete set of accounts including balance sheets must exist for an institutional unit, or it must at least be possible, in principle, and meaningful to compile such a set of accounts.

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[4] These dimensions could be an object of further research. Their incorporation into the KZN SAM is important given the structure of the KZN Economy.

Figure 13: The scope of the KZN SAM 2005

SCOPE OF THE SAM

30 INDUSTRIES

30 COMMODITIES

12 INCOME GROUPS

10 OCCUPATION GROUPS

2 GENDER

4 RACES

4 INSTITUTIONS

KZN SAM, 2005

30
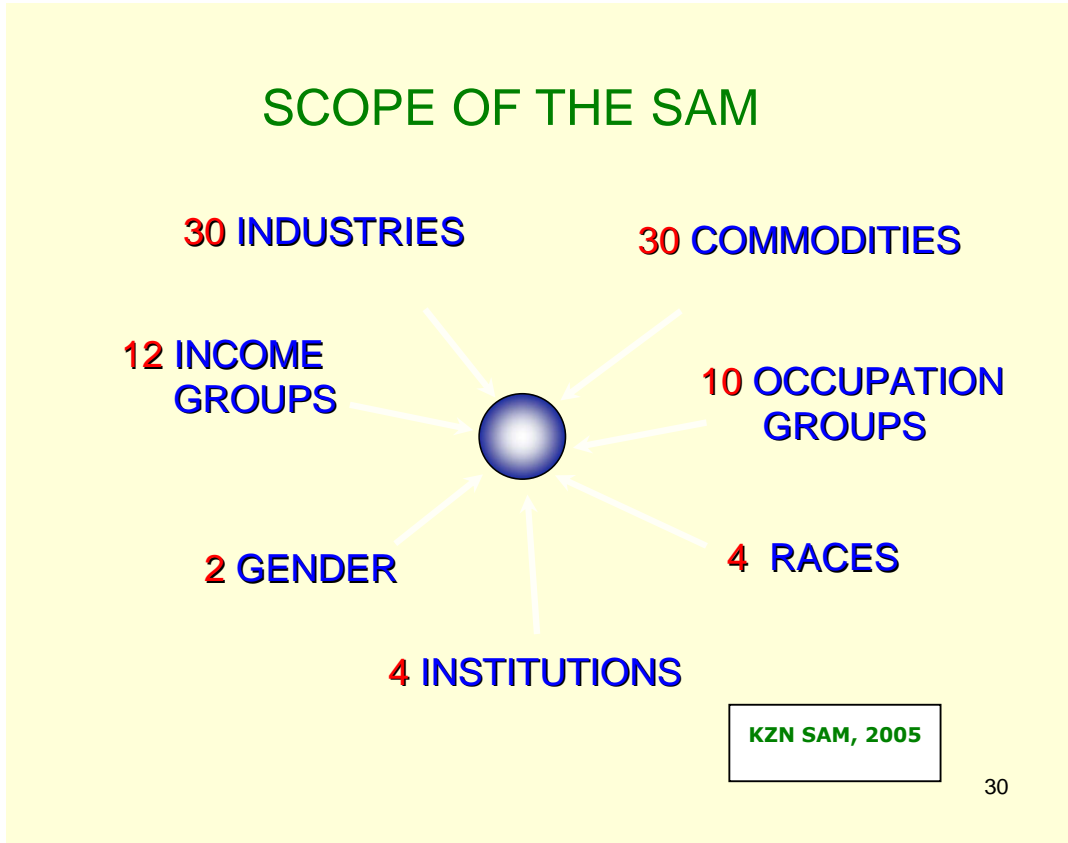
Source: KwaZulu-Natal Provincial Treasury, 2007

Table 11: Institutions used in the SAM

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: SNA 1993

36

The 1993 SNA distinguishes four main categories of institutional units:

- Corporations (including quasi-corporations)
- Government units (including social security funds)
- Households
- Non-profit institutions (NPI)[5].

In order to describe income, expenditure, financial flows and balance sheets, institutional units are grouped into sectors on the basis of their principal functions, behaviour and objectives. The 1993 SNA distinguishes five main institutional sectors:

- Non-financial corporations
- Financial corporations
- General government, including social security funds
- Households
- NPIs serving households (NPISHs)[6].

Table 12 provides a description of the occupational groups and skill levels used in the SAM. It shows that half of the labour force falls within skill level 2 (people with secondary education).

Table 12: Major occupational groups and skill levels

Skill level	10 occupational groups	Size (%)	Description of educational level
4	Legislators	11.8	Education which begins at the age of 18 or 19, lasts three, four or more years, and leads to a university (or post-graduate university) degree.
4	Professionals		
3	Technicians	9.4	Education which begins at the age of 17 or 18, lasts one to four years, and leads to an award not equivalent to a first university degree.
2	Clerks		Secondary education which begins at the age of 13 or 14 and lasts about five years. A period of on-the-job-training and experience may be necessary.
2	Service Workers		
2	Skilled agricultural workers	50.0	
2	Craft workers		
2	Plant & machine operators		
1	Elementary occupations		Primary education which generally begins at the age of 6 or 7 and lasts about 7 years. Including persons without any formal primary education, or with incomplete primary education.
1	Domestic workers	28.8	
	TOTAL	**100**	

Source: KwaZulu-Natal Provincial Treasury, 2007

Since poverty is one of the main policy concerns in the province, households income and expenditure need to be detailed in the SAM to enable simulation at different income groups. Table 13 provides the key between percentiles and annual household expenditure. The 2000 Income and Expenditure Survey compiled by Statistic South Africa was used to derive the KwaZulu-Natal's figures. Simulation results are provided in Table 25.

One of the differences between the 1968 SNA and the 1993 SNA is that the input output matrix based on the 1968 SNA has industries in both row and column. But the SU-Tables based on the 1993 SNA have products in the row and industry in the column. Table 14 lists the main industries with a detailed description of the

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[5] Not included in the KZN SAM

[6] Not included in the KZN SAM

products used in the compilation of both the 2005 KZN SU-Tables and the KZN 2005 SAM. It gives the Rand value of total industry production (Rm 649,041), also referred to as total output. Table 14 shows for example that in 2005, KwaZulu-Natal's coal industry produced output amounting to Rm 8,094.

Table 13: Key to percentiles and annual household expenditure

Percentile	Annual household expenditure (Rand)			% of population		
Percentile 1	1	—	1004	0	—	5
Percentile 2	1005	—	1060	6	—	10
Percentile 3	1061	—	15802	11	—	20
Percentile 4	15803	—	19932	21	—	30
Percentile 5	19933	—	24177	31	—	40
Percentile 6	24178	—	29440	41	—	50
Percentile 7	29441	—	37185	51	—	60
Percentile 8	37186	—	49394	61	—	70
Percentile 9	49395	—	70464	71	—	80
Percentile 10	70465	—	107537	81	—	90
Percentile 11	107538	—	141062	91	—	95
Percentile 12	141063+			96	—	100

Source: Stats S.A (2005), KwaZulu-Natal Provincial Treasury (2007)

Table 14: Main industries and products

SIC	Industries	Amount (Rm)	Detailed description of products
10	Agriculture	24,732	Agriculture, hunting, forestry and fishing.
21	Coal	8,094	Mining of coal and lignite.
22	Other mining	6,898	Other mining and quarrying; service activities incidental to mining of minerals; Gold and uranium ore.
30	Food, Beverage and Tobacco	41,985	Production, processing and preserving of meat and meat products; Processing and preserving of fish and fish products; Processing and preserving of fruit and vegetables; Vegetable and animal oils and fats; Dairy products; Grain mill products; starches and starch products; Animal feeds; Bakery products; Sugar, including golden syrup and castor sugar; Cocoa, chocolate and sugar confectionery; Other food products n.e.c.; blending of spirits, wine, beer, other malt liquors, malt, soft drinks; production of mineral waters and tobacco products.
31	Textile, Clothing and Leather	23,021	Preparation and spinning of textile fibres; weaving of textiles and finishing of textiles; Made-up textile articles, except apparel; Carpets and rugs; Other textiles n.e.c.; Knitted and crocheted fabrics and articles; Wearing apparel; dressing and dyeing of fur; articles of fur; Tanning and dressing of leather; Luggage, handbags and the like, saddlery and harness.
31	Footwear	1,057	Footwear.
32	Wood and Paper	28,831	Sawmilling and planing of wood, products of wood, cork, straw and plaiting materials; Pulp, paper and paperboard; Corrugated paper and paperboard, containers of paper and paperboard; Other articles of paper and paperboard; Publishing (excluding recorded media) and printing; Publishing and reproduction of recorded media.
33	Coke, Petroleum, Chemicals, Rubber and Plastic	63,478	Coke oven products, processing of nuclear fuel and petroleum refineries/synthesizers; Basic chemicals, except fertilizers and nitrogen compounds; Fertilizers and nitrogen compounds; Plastics in primary forms and synthetic rubber; man-made fibres; Pesticides and other agrochemical products; Paints, varnishes and similar coatings, printing ink and mastics; Pharmaceuticals, medicinal chemicals and botanical products; Soap, detergents, cleaning-, polishing-, perfume- and toilet preparations; Other chemical products n.e.c.; Rubber tyres and tubes; retreading, rebuilding of rubber tyres; Other rubber products.
34	Other non-metallic mineral Product	4,518	Plastic products; Glass and glass products; Non-structural non-refractory ceramicware; Refractory and structural non-refractory clay and ceramic products; Cement, lime and plaster; Articles of concrete, cement, plaster, stone and other non-metallic mineral products n.e.c.; Basic iron and steel; casting of iron and steel; non-ferrous metals; casting of non-ferrous metals.
35	Basic Metals, Machinery and Equipment	52,387	Structural metal products, tanks, reservoirs and steam generators; Forging, pressing, stamping, roll-forming of metal; powder metallurgy, treatment and coating of metals and general mechanical engineering; Cutlery, hand tools and general hardware; Other fabricated metal products n.e.c.; Engines and turbines, except aircraft, vehicle and motor cycle engines; Pumps, compressors, taps and valves; Bearings, gears, gearing and driving elements; Lifting and handling equipment; Other general purpose machinery; Agricultural and forestry machinery; Machine-tools; Machinery for mining, quarrying and construction; Machinery for food, beverage and tobacco processing; Household appliances n.e.c Office, accounting and computing machinery.
36	Electrical Machinery and Apparatus	5,312	Electric motors, generators and transformers; Electricity distribution and control apparatus; Insulated wire and cable; Accumulators, primary cells and primary batteries; Electric lamps and lighting equipment.
37	Radio, Television, Watches and Clocks	8,366	Radio-, television- and communication equipment and apparatus; Medical, precision- and optical instruments, watches and clocks.
38	Transport Equipment	37,307	Motor vehicles (including their engines) and bodies (coachwork) for motor vehicles; trailers and semi-trailers; Parts and accessories for motor vehicles and their engines; Other transport equipment n.e.c.

39	Furniture and other Manufacturing Products	3,357	Furniture; Jewellery and related articles; Other manufacturing and recycling of metal- and non-metal waste and scrap.
41	Electricity and Gas	7,965	Electricity, gas, steam and hot water supply.
42	Water	4,465	Collection, purification and distribution of water.
50	Construction	25,243	Buildings, specialist trade contractors, building installation, building completion; Site preparation; construction of civil engineering structures and construction of other structures; renting of construction / demolition equipment with operators.
61	Wholesales	28,138	Wholesale trade, commission trade (except of motor vehicles and motor cycles).
62	Retails Trade	20,917	Retail trade; repair of personal and household goods.
63	Motor Trade, Repair of Motor Vehicles	9,294	Maintenance and repair of motor vehicles and motor cycles and retail trade in automotive fuel.
64	Hotels and Restaurants	3,984	Hotels, camping sites, other provision of short-stay accommodation; restaurants, bars, canteens.
71	Transport	49,166	Transport, supporting and help activities related to transport;
75	Post and Telecommunication	22,358	Post, courier activities and telecommunications.
81	Finance	13,421	Financial intermediation.
83	Insurance	27,347	Insurance and pension funding.
84	Real Estate	20,900	Real Estate activities.
80	Business Services	16,496	Business activities and services.
90	General Government Services	90,004	Other individual and collective general government; Human health, veterinary and social work activities; Education, other services and other activities n.e.c.
TOTAL OUTPUT		**649,041**	**Total supply of goods and services at purchaser's price**

Source: KwaZulu-Natal Provincial Treasury, 2007

4.2.2 KZN SU-Tables, the building block of the KZN SAM

The SU-Tables[7], often regarded as the cornerstone of the 1993 SNA, also serve as the foundation in constructing the SAM. They are intended to include all transactions in goods and services in an economy for a specific year, in a matrix format.

The information contained in the SU-Tables is transferred to the SAM which adds to it a dimension of generation and distribution of income to households. The impact analysis shifts from sector performance (from the SU-Tables) to household welfare (from the SAM). Examples of what the SU-Tables can be utilised for are:

- determining the province's comparative advantages
- depicting the forward and backward linkages generated through an investment
- assessing the production and cost structure of commodities, industries and sectors
- determining inter-industry impact analysis through multipliers
- assessing the number of jobs created (sustained) through infrastructure projects
- analysing the flow of goods and services within the regional economy
- assessing the impact of investment on various sectors.

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[7] Detailed Supply and Use Tables for 2005 reference year and the economic model based on the SUT are published in a separate paper available at KZN Provincial Treasury.

The SU-Tables provide the following information as building blocks for the SAM:

- Total domestic supply of good and service at basic prices
- Imports of goods and services
- Exports of goods and services
- Trade and transport margins
- Taxes on products and subsidies on products
- Taxes on production and subsidies on production
- Domestic use of goods and services intermediate consumption expenditure
- Private consumption expenditure by households
- Government consumption expenditure
- Gross fixed capital formation (public and private investments)
- Changes in inventory
- Compensation of employees
- Gross value added
- Gross operating surplus.

The manner in which the information listed here interlinks (i.e. in terms of flows of goods and services) is illustrated in Figure 13. Tables 7 and 8 contain high level aggregated KZN SU-Tables (9 x 9) and the multipliers derived from the 9 x 9 SUT. The aim of this exercise is to show how the Macro SU-Tables (Tables 7 and 8) are integrated in the Macro SAM (Table 10). In this Macro SAM, the first two rows and columns contain an aggregated version of the KZN Supply and Use Table (2005 KZN SUT), thus explicitly linking up with the other accounts of the system.

The supply table (Table 16) shows the total supply (Rm 649,042); that is the total value of goods and services produced in the provincial economy plus the imports of which

- Rm 559,119 is domestically produced. This amount is recorded in row 2 column 1 of the Macro SAM (Table 10)
- Rm 62,316 is imported (Macro SAM row 10 column 1)
- Rm 27,207 represents taxes les subsidies on products (Macro SAM 5 row 2 column 1).

The Use Table (Table 8) shows the total use of produced goods and services (Rm 649,042) mentioned in the supply table, of which

- the intermediate consumption expenditure is Rm 335,440 (Macro SAM row 1 column 2), which represents the total cost of producing Rm 559,119 worth of goods and services
- the total final demand is Rm 313,602, which represents

a) Private (household) and public (government) consumption expenditures amounting to Rm 198,747 (Macro SAM row 1 column 6)
b) Gross fixed capital expenditure (public and private investment) amounting to Rm 37,385 (Macro SAM row 1 column 7)
c) Changes in inventories amounting to Rm 1,663 (Macro SAM row 1 column 8); and
d) Exports of goods and services amounting to Rm 75,807 (See Macro SAM Table 5 row 1 column 10).

To balance the accounts, the following identities apply for both the SU-Tables and the SAM:

On the Supply side (Table 7):

    = Total domestic output
    + Imports
    = Total supply of goods and service at basic prices
    + Trade and transport margins
    + Taxes less subsidies on products
    = Total supply of goods and service at purchasers' prices

On the Use side (Table 8):

    = Total intermediate consumption expenditure
    + Household consumption expenditure
    + Government Consumption expenditure
    + Gross Fixed Capital Formation
    + Exports of good and services
    = Total supply of goods and service at purchasers' prices

Generation of income side (Table 8):

    = Compensation of employees
    + Gross operating surplus
    + Taxes less subsidies on products
    + Taxes less subsidies on production
    = Gross Domestic Product

Total supply and total use:

    = Total output
    + Total intermediate consumption expenditure
    = Gross value added

A well-known method of deriving the GDP of a country (or province) is simply to add up total consumption expenditure by household, government, investment and net export. Figure 14 shows that 48% of total output (domestic and foreign) produced in the province is consumed as final demand, the reminder being reutilised in the production process of other goods. Figure 14 shows how final consumption expenditure is distributed among various institutions. Private (household) consumption expenditure accounts for almost half of total final demand. The size of an economy depends on these components of final demand. As people move from the second economy to the first economy, the level of household consumption will increase as a result of high demand for goods and services. This will lead in turn to higher production output and economic growth.

Figure 14: Final Consumption expenditure (%) 2005

Components of Final Demand, 2005

Exports 24%
Changes in Inventory 1%
Households 46%
Investment 12%
Government 17%
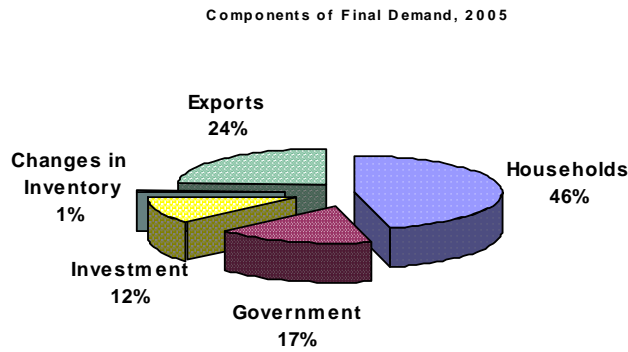
Source: KwaZulu-Natal Provincial Treasury, 2007

Figure 15: KZN Flow of Goods and Services 2005 (R million)

(A) Production of Goods R267,714 (48%)

(B) Production of Services R291,404 (52%)

(C) Imports of Goods R52,170 (84%)

(D) Imports of Services R10,147 (16%)

(E) Intermediate Input R335,440 (60%)

(F) Total Production of Goods & Services at Basic Prices R559,119 (90%)

(G) Total Imports of Goods & Services R62,316 (10%)

(H) Gross Value Added R223,679 (40%)

(I) Total Supply of Goods & Services at Basic Prices R621,435 (96%)

(J) Compensation of employees R117,776 (53%)

(K) Gross Operating Supply R100,856 (45%)

(L) Other taxes less subsidies on production R5,044 (2%)

(M) Taxes less Subsidies on products R27,607 (4%)

(N) Total Use (Demand) (649,041)

(O) Total Supply (649,041)

(P) Intermediate Demand R335,440 (52%)

(Q) Final Demand R313,606 (48%)

(R) Domestic Final Demand R237,795 (76%)

(S) Exports R75,807 (24%)

(T) Goods R83,337 (35%)

(U) Services R154,457 (65%)

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Figure 15 shows the flow of goods and services in KwaZulu-Natal. In this figure, accounts and sub-accounts are provided in Rand value, and percentage in sub-accounts is 100% of the main account. Figure 14 indicates that in 2005, total supply[8], that is the total value of goods and services produced in the province, amounted to R649,041 million (Box O), of which R621,435 million (96%) was from the total supply of goods and services at basic prices (Box I), and R27,607 million (4%) was from taxes less subsidies on products (Box M). From the total supply of R621,435 million (Box I), 90% was domestically produced (Box F) and the rest was imported (Box G). The KZN domestic production (Box F) was made up of the production of goods (48% – Box A) and services (52% – Box B). Of total domestic production, 60% is the cost of production or intermediate inputs (Box E) and the balance is the gross value added (Box H). Total imports (Box G) were made up of imports of goods (84% – Box C) and imports of services (16% – Box D).

To balance the economic accounts, total demand must equal total supply (Box N and Box O). Demand (i.e. consumption of goods and services) is made up of one portion that is re-utilised in the production process as intermediate inputs (52% - Box P), and another portion that goes for final demand (48% – Box Q). The components of final demand consist of domestic final demand (76% – Box R) (i.e., household consumption expenditure, government consumption expenditure, and gross fixed capital formation) and foreign final demand or exports (24% – Box S). The domestic final consumption expenditure consists of the consumption of goods (35% – Box T) and services (65% – Box U).

4.2.2.1 Inter-industry linkages

The flow of goods and services in Figure 15 clearly reveals that economic agencies do not operate in isolation. More recently, linkage analysis methods have again attracted increasing attention from policy analysts throughout the world. The RSUTs model for KwaZulu-Natal yields linkage indicators to identify key regional economic industries.

The results presented in this paper, including the multipliers (Table 18), could be used to study the province's development strategy.

In regard to the measurement of linkage coefficients, two principal methods are used to examine the interdependency between the production and cost structures of the economy. These are the *Chenery-Watanabe method* and the *Rasmussen method*, both of which consider the backward linkage and forward linkage of industries. Both methods[9] are applied to KwaZulu-Natal SU-Tables model.

The *Chenery-Watanabe method* is derived from the input coefficient, a demand-driven model that attempts to supply a quantitative evaluation of backward and forward linkages for the economy's production structure.

The backward linkages of an industry *j* are defined as:

$$BL_j^c = \sum_{i=1}^{n} \frac{x_{ij}}{x_j} = \sum_{i=1}^{n} a_{ij} \qquad \textbf{(28)}$$

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[8] Total Supply is domestic production plus Imports of goods and services ready for consumption. Also, total supply per sector minus cost of production equals Gross Value Added (GVA) for that sector. The sum of GVA equals GDP-R.

[9] Table 8 and Table 9 combine both the *Chenery-Watanabe method* and *Rasmussen method*, where backward and forward linkages are shown in terms of selected industries and products.

where BL_j^c denotes the backward linkage of industry j, xij is the magnitude of industry i's output used as production input by industry j, xj is industry j 's output and aij is the input coefficient of industry j to industry i.

The forward linkages of an industry i are defined as:

$$FL_i^c = \sum_{j=1}^{n} \frac{x_{ij}}{x_i} = \sum_{j=1}^{n} a_{ij} \qquad \textbf{(29)}$$

The flaw in this method is that the coefficients measure only the initial effect generated by inter-dependencies between industries. These coefficients yield the direct backward and forward linkages.

The *Rasmussen method* is based on the Leontief inverse matrix (I-A) [1], and is used to measure inter-industry linkages.

The backward linkage BL_j reflects the effect of an increase in final demand of industry j on overall output; in other words, it measures the extent to which a unit change in the demand for the product i of industry j causes production increases in all industries:

$$BL_j = \sum_{i=1}^{n} g_{ij} \qquad \textbf{(30)}$$

where, g_{ij} is the *ij*th element of the Leontief inverse matrix.

The forward linkage FL_j^R measures the magnitude of the increase in output in industry i, if the final demand in each industry were to increase by one unit; in other words, it measures the extent to which industry i is affected by an expansion of one unit in all industries.

4.2.2.2 Multipliers derived from the SU-Tables

Table 15 provides the Leontief inverse coefficients based on the 2005 SU-Tables. The conventional Leontief inverse matrix is a matrix $(I-A)^{-1}$ that represents the production required, both directly and indirectly, per Rand of delivery, for final demand. The Leontief inverse coefficients indicate the relationship between final demand and production.

X = (I–A)-1 F
     (31)

The effect of an increase in demand for a certain commodity endures even after the required direct intermediate inputs are generated. It generates a long chain of interaction in the production process since each of the commodities used as inputs must be produced, and will, in turn, require various inputs.

One cycle of input requirements precedes another cycle of inputs, which in turn precedes another cycle, and so on. The sum of all these "chain reactions" appears in the inverse matrix. Another name for the Leontief inverse matrix is *the total requirements matrix*: appropriate because the matrix translates the direct and indirect effects of an event into total effects on the economy in the model.

The Leontief inverse matrix is very important in IO analysis as it provides the link between production and final demand. Given a postulated set of final demands,

output levels required to meet the specified demand can be computed through the inverse matrix. The matrix is obtained as the inverse of the technology matrix (I-A), where A is the matrix of input coefficients and I is the identity matrix. It corresponds to the direct and indirect input requirements by industries that are required to meet a unit increase in the final demand for that industry's output.

In the case of KwaZulu-Natal's primary industry, an increase in output through the expenditure of R1 million will cause the direct and indirect requirements to be relatively dispersed across industries and products.

For example, the multipliers in Table 15 reveal that if KwaZulu-Natal's agricultural industry augments output through the expenditure of R1 million, the manufacturing industry's production increases by R1 million $\times$ 0.5887 = R0.59 million. Reading Table 15 from the industry side,

> R1 spent in Agriculture Industry leads to R0.5867 in Manufacturing Industry and R0.7532 in Manufacturing Products;

> R1 spent in Mining Industry leads to R0.3359 in Manufacturing Industry and R0.4231 in Manufacturing Products; etc.

Reading Table 15 from the product side,

> R1 spent in Agriculture Product leads to R0.5071 in Manufacturing Industry and R0.6485 in Manufacturing Products;

> R1 spent in Mining Product leads to R0.1370 in Manufacturing Industry and R0.0.1725 in Manufacturing Products; etc.

The Leontief Multipliers shown in Table 15 indicate that for every R1 spent in any of the 9 sectors, the highest impact is felt in the Manufacturing sector. In other words the manufacturing sector is the main beneficiary of every R1 spent in any of the nine sectors of the economy. This enhances the sustainability of the manufacturing sector and contributes to the process of industrialization in the province of KwaZulu-Natal. It could probably also be one of the reasons that cause the manufacturing sector to be the highest contributor to the provincial GDP.

Table 15: Leontief inverse multipliers derived from KZN SU-Tables 2005

INDUSTRY	Primary			Secondary			Tertiary		
	Agriculture	Mining	Manufacturing	Electricity	Construction	Trade	Transport	Finance	Government
Agriculture	1.0922	0.0286	0.1487	0.0219	0.0606	0.0308	0.0417	0.0198	0.0285
Mining	0.0122	1.0100	0.0291	0.0705	0.0483	0.0076	0.0108	0.0059	0.0071
Manufacturing	0.5867	0.3359	1.7837	0.2460	0.6795	0.3349	0.4953	0.2292	0.3163
Electricity	0.0343	0.0426	0.0491	1.2278	0.0309	0.0329	0.0439	0.0244	0.0221
Construction	0.0097	0.0127	0.0068	0.0574	1.2292	0.0179	0.0139	0.0271	0.0123
Trade	0.0151	0.0219	0.0135	0.0117	0.0134	1.0523	0.0636	0.0289	0.0257
Transport	0.1029	0.2376	0.0857	0.0526	0.0699	0.1322	1.1596	0.0729	0.0611
Finance	0.0873	0.0877	0.1254	0.1054	0.1614	0.2263	0.1810	1.3558	0.1225
Government	0.0305	0.0602	0.0474	0.0138	0.0354	0.0206	0.0340	0.0278	1.1352
Agriculture	0.1072	0.0330	0.1731	0.0244	0.0663	0.0355	0.0484	0.0225	0.0330
Mining	0.0294	0.0241	0.0710	0.1715	0.1132	0.0179	0.0258	0.0137	0.0170
Manufacturing	0.7532	0.4231	1.0055	0.3077	0.8557	0.4145	0.6245	0.2683	0.3867
Electricity	0.0364	0.0453	0.0523	0.2422	0.0301	0.0349	0.0467	0.0257	0.0234
Construction	0.0118	0.0156	0.0080	0.0721	0.2891	0.0215	0.0167	0.0325	0.0149
Trade	0.0154	0.0220	0.0132	0.0122	0.0135	0.0559	0.0678	0.0303	0.0239
Transport	0.1069	0.2476	0.0887	0.0542	0.0719	0.1366	0.1655	0.0738	0.0630
Finance	0.0935	0.0913	0.1351	0.1143	0.1750	0.2452	0.1950	0.3877	0.1308
Government	0.0361	0.0713	0.0562	0.0164	0.0420	0.0244	0.0403	0.0329	0.1601

PRODUCTS	Agriculture	Mining	Manufacturing	Electricity	Construction	Trade	Transport	Finance	Government
Agriculture	0.9378	0.0116	0.1142	0.0205	0.0677	0.0351	0.0402	0.0255	0.0357
Mining	0.0105	0.4118	0.0225	0.0661	0.0470	0.0084	0.0104	0.0073	0.0083
Manufacturing	0.5071	0.1370	1.3698	0.2307	0.6134	0.3895	0.4775	0.2990	0.4053
Electricity	0.0295	0.0174	0.0377	1.1515	0.0384	0.0328	0.0424	0.0250	0.0232
Construction	0.0083	0.0052	0.0052	0.0538	0.9727	0.0175	0.0137	0.0294	0.0116
Trade	0.0130	0.0089	0.0104	0.0109	0.0116	0.9729	0.0613	0.0278	0.0469
Transport	0.0885	0.0969	0.0658	0.0493	0.0618	0.1260	1.1116	0.0775	0.0616
Finance	0.0752	0.0357	0.0963	0.0988	0.1348	0.2148	0.1915	1.2466	0.1354
Government	0.0263	0.0246	0.0364	0.0130	0.0306	0.0212	0.0330	0.0280	0.9623
Agriculture	1.0923	0.0135	0.1330	0.0229	0.0605	0.0406	0.0466	0.0293	0.0414
Mining	0.0254	1.0098	0.0545	0.1609	0.0942	0.0198	0.0249	0.0165	0.0200
Manufacturing	0.6485	0.1725	1.7722	0.2885	0.7280	0.4284	0.6017	0.2994	0.4113
Electricity	0.0314	0.0185	0.0402	1.2272	0.0287	0.0346	0.0450	0.0263	0.0246
Construction	0.0102	0.0064	0.0061	0.0676	1.2298	0.0204	0.0165	0.0312	0.0141
Trade	0.0133	0.0090	0.0101	0.0114	0.0116	1.0523	0.0653	0.0288	0.0228
Transport	0.0919	0.1009	0.0681	0.0508	0.0636	0.1302	1.1595	0.0729	0.0636
Finance	0.0805	0.0372	0.1037	0.1072	0.1460	0.2327	0.1920	1.3625	0.1307
Government	0.0311	0.0291	0.0432	0.0154	0.0363	0.0251	0.0391	0.0331	1.1402

Source: KwaZulu-Natal Provincial Treasury, 2007

Table 16: KwaZulu-Natal Supply Table (R million − 2005)

Supply of products	Total supply at purchasers' prices	Taxes less subsidies on products	Trade and Transport margins	Total supply at basic prices	Output of industries			Total industry	Imports
					Primary Industry	Secondary industry	Tertiary industry		
Primary products	39,724	306	3,394	36,004	27,343	48	-	27,391	8,613
Secondary products	307,292	21,540	1,872	283,879	527	239,795	-	240,323	43,557
Tertiary products	302,025	5,741	(5,266)	301,551	24	13,228	278,153	291,404	10,147
Total output at basic prices	649,041	27,587	-	621,434	27,894	253,071	278,153	559,118	62,316

Source: KwaZulu-Natal Treasury (2007)

Table 17: KwaZulu-Natal Use Table (R million − 2005)

USE TABLE	Total supply at purchasers' prices	Taxes less Subs. on products	Intermediate Consumption Expenditure			Total industry	Components of final demand					Total Final Demand
			Primary	Secondary	Tertiary		House-holds	Govern-ment	Fixed capital formation	Changes in inventories	Exports	
Primary products	39,724		1,134	31,320	543	40,256	1,875	-	-	(116)	4,127	6,726
Secondary products	307,292		9,560	131,456	52,710	188,551	58,037	-	21,940	1,601	32,827	113,565
Tertiary products	302,026		3,997	25,717	79,001	106,630	84,694	54,141	15,444	178	38,854	193,311
Total uses	649,041		14,691	188,494	132,254	335,439	144,606	54,141	37,385	1,663	75,807	313,602
Gross value added		27,607	13,203	64,578	145,898	223,679						
Total output	649,041		27,894	253,073	278,152	559,119						

Source: KwaZulu-Natal Treasury (2007)

4.3 Macro and Micro preliminary KwaZulu-Natal SAM 2005

The Social Accounting Matrix (SAM) is a square matrix and can be considered as an organized framework that presents a set of accounts between and within which the flows of funds represent the circular flows of income in a market economy. By convention, the entries made in rows represent resources, incomes, receipts or changes in assets, whilst the entries made in columns represent uses, outlays, expenditures or changes in liabilities and net worth, each transaction being recorded only once in a cell of its own.

In building the KwaZulu-Natal SAM, consideration was given to both the 1993 version of the United Nations System of National Accounts, SNA 1993, compiled and published by the United Nations Statistical Office (ISWG, 1993), and the European System of National and Regional Accounts, ESA 1995 (Eurostat, 1996). The KZN SAM is thus based on international and best practices.

The KwaZulu-Natal's Social Accounting Matrix (KZN SAM, 2005) is an extension of the 2005 SU-Tables[10]. It presents the regional economy in a matrix format, depicting the linkages that exist between all the different role players (public sector, business sector, household) in the regional economy. Table 18 is a high-level aggregation of the KZN SAM that depicts the Provincial Accounting Matrix (PAM), also referred to as Macro SAM, from which the disaggregated KZN SAM shown in Table 20 was built.

This section provides detailed information on the KZN SAM, 2005, related to production structure, composition of value added, income distribution, consumption, and savings patterns in form of accounts. It also gives a comparative indication of the domestic regional economy in relation to "rest of the world" (i.e. non-KwaZulu-Natal).

The first two accounts in both Tables 18 and 20, viz., "*Goods and services accounts*"[11] and "*production accounts*", are compiled from the Supply and Use Tables (See also Figure16 for more explanation). Table 18 shows that in 2005 total goods and services to the value of R649,042 million were produced in the province (Row 1, Column 1). The total of intermediate consumption expenditure, gross value added, and consumption or depreciation of fixed capital accounts, amounting to R559,119 million, balances with total supply of goods and services (Row 2, Column 2).

The generation of income[12] (Row 3, Column 3) amounting to R190,132 million records the distributive transactions resulting from the production process, and it consists of transactions by which the value added generated by production is distributed to labour and race (Table 18 and Table 20). Figure 17 shows that half of this income is generated by Whites. In the province, the compensation of employees from/or to the rest of the world is negligible (less than 4% of the GVA).

The Allocation of Primary Income account (R335,290 million) focuses on the distribution of primary incomes to resident institutional sectors, and a portion of the allocation also goes to "rest of the world". Note that the household sector is the only resident institutional sector that receives compensation of employees, while the general government sector is the institution that receives taxes on production.

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[10] Electronic copies of the detailed 2001, 2004 and 2005 KZN SUTs are available at KZN Provincial Treasury.

[11] The goods and services account shows the total resources (output and imports) and the use of goods and services (intermediate consumption, final consumption, gross capital formation, and export). Taxes on products (less subsidies) are also included on the resource side of the accounts.

[12] The generation of income account provides for the distribution of primary income to various institutional sectors. Primary incomes are income that accrues to institutional sectors and industries as a consequence of their involvement in the process of production or ownership of assets that may be needed for purposes of production.

Similarly, property income (R115,785 million) is received in the province by owners of financial assets and tangible non-produced assets (land, subsoil asset) in return for providing funds to, or putting tangible non-produced assets at the disposal of other institutional units.

Turning to the secondary distribution of income accounts (R325,284 million), Tables 18 and 20 show the redistribution of income and how it ends up in the disposable income of institutional sectors. It is important to highlight that not all disposable income[13] (R211,130 million) is available in cash, since part of it is derived from transactions in kind. Such income in kind is all deemed to be consumed by the households that receive it. The total of the disposable income of all institutional sectors is equal to the provincial disposable income.

All transactions in the secondary distribution of income account are transfers that are either current or capital.

The next account deals with the *use of disposable income* (R227,254 million – row 6, column 6; Tables 18 and 20). The purpose of this account is to show how households and general government allocate their disposable income between final consumption and saving. This account has two sub accounts:

The actual final consumption expenditure of goods and services (R 198,747 million) acquired by an institutional unit, i.e. household and government, regardless of whether the institutional unit has incurred the expenditure or not.

The adjustment for the change in the net equity of households on pension funds (R16,124 million). The net equity of households on pension funds is a financial asset and is needed as an item here because households are the owners of the funds of private pension schemes.

Moving on from the supply and use of goods and services, and the generation of income accounts, we turn now to the capital account which records transactions in the non-financial assets and payment of capital transfers; i.e. those transfers that are regarded as affecting wealth rather than income (row 8, column 8; Tables 18 and 20). The gross fixed capital formation is calculated as

=	Consumption of Fixed Capital	33,547
+	Net Fixed Capital Formation	3,838
=	Gross Fixed Capital Formation	37,385

The capital account makes it possible to determine the extent to which acquisitions less disposals of non-financial assets have been financed out of savings and by capital transfers. It shows the net borrowing corresponding to the amount which a unit or sector is obliged to borrow from other units or sectors.

The net acquisition of financial assets minus the net incurrence of liabilities equals the net lending or net borrowing. This relationship explains the financial accounts which by

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[13] This disposable income can be interpreted as the maximum amount that a unit can spend on consumption goods and services without disposing of its assets or increasing its liabilities. It includes taxes received, in the case of Government, and current taxes paid, in the case of households and corporations. A sector's disposable income is its income from production, as modified by receipts and payments of property incomes, taxes and transfers. It represents the amount available for current consumption and for saving.

definition record transactions in financial instruments such as securities, bank deposits, or accounts receivable, and net incurrence of liabilities, i.e. mortgages, securities, or accounts payable.

The last set of accounts is the "rest of the world". It is difficult to accurately estimate this account at a provincial level. For the KZN SAM 2005 the rest of the world was mainly used as a residual or a balancing account. It is also important to highlight that this provincial SAM does not includes the balance sheet accounts.

Figure 16: Generation of income by race 2005
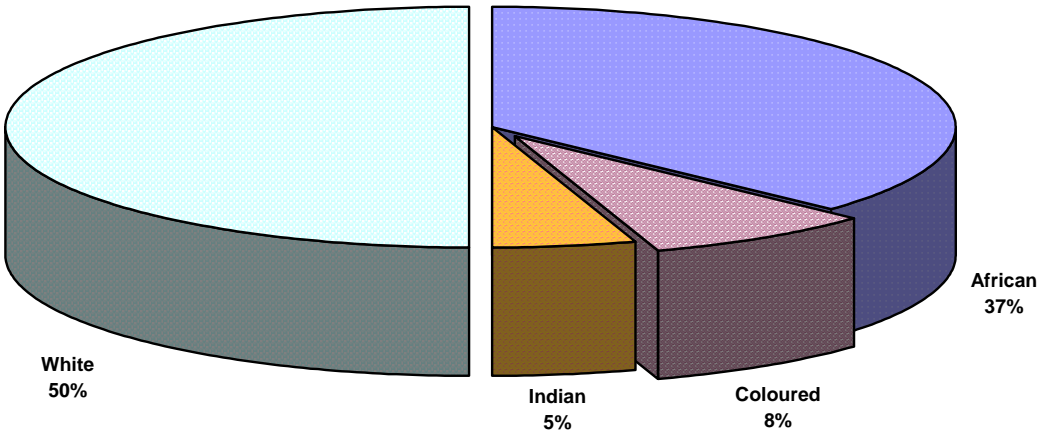
Source: KwaZulu-Natal Treasury (2007)

4.4 Multipliers derived from the KZN SAM 2005

The KZN SAM is a quantitative tool for analytical purposes used, among other things, to quantify social and economic impacts of projects and investments. The Economic Model[14] is constructed using the Leontief multipliers provided in Table 19. To run simulations, policy analysts might, in addition to the Leontief multipliers, need to develop the following multipliers from the SAM:

(i)   Labour multipliers

(ii)   Household multipliers

(iii)   Capital multipliers

(iv)   Social impact multipliers

(v)   Tax multipliers.

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[14] All econometric models involve the use of two types of economic variables: (i) Endogenous (dependent) variables: these variables are determined within the model and the magnitude of their variations are determined by "shocks" or influences from outside the model, and (ii) Exogenous (independent) variables: these variables are determined outside the model and their nature and magnitude are taken as given when developing an econometric model. Exogenous variables are the external "shocks" on econometric models that affect the endogenous variables. From the definition of exogenous variables, it should be apparent that the accuracy of the results generated by the econometric model is determined by the accuracy of the exogenous input data.

Table 18: Macro KwaZulu-Natal SAM 2005

KwaZulu-Natal Social Accounting Matrix: Provincial Accounting Matrix (PAM 2005, R m)

Integrated Economic Account (classification)		Goods and services	Production	Generation of income	Allocation of primary income	Secondary distribution of income	Use of disposable income	Capital	Capital	Financial intermediaries	Trade (Rest of the World) Current	Trade (Rest of the World) Capital	TOTAL
		1	2	3	4	5	6	7	8	9	10	11	12
Goods and services	1	Trade and Transport Margins 0	Use/Intermediate consumption 335,440				Final Consumption Expenditure 198,747	Changes in inventories 1,663	Gross fixed capital formation 37,385		Exports of goods and services 75,807		649,042
Production	2	Supply Output 559,119											559,119
Generation of income	3		Domestic net value added, at basic prices 190,132								Compensation of employees from ROW 158		190,290
Allocation of primary income	4	Taxes less subsidies on products 27,607		Net generated income at basic prices 189,563	Property income : resident sector 115,785						Property income from ROW 2,315		335,250
Secondary distribution of income	5				Net National Income 212,535	Current Transfers : Resident sector 112,651					Current transfers from ROW 98		325,284
Use of disposable income	6					Net disposable income 211,130	Adj. for change in net equity hh. On resident pension funds 16,124				Adj. for change in net equity hh. On resident pension funds frim ROW 0		227,254
Capital	7						Net savings 12,383	Capital transfers		Borrowing 80,006		Capital transfers from ROW -200	92,189
Capital	8		Consumption of fixed capital 33,547					Net fixed capital formation 3.838					37,385
Financial intermediaries	9							Lending 86,588				Net lending of ROW -6,582	80,006
Trade (Current)	10	Imports of goods and services 62,316		Compensation of employees to ROW 727	Property Income to ROW 6,950	Current transfers to ROW 1,503	Adj. for change in net equity hh. On resident pension funds to ROW						71,496
Trade (Capital)	11							Capital transfers to ROW 100			Current external balance -6,882		-6,782
TOTAL	12	649,042	559,119	190,290	335,250	325,284	227,254	92,189	37,385	80,006	71,496	-6,782	

Table 19: Leontief inverse multipliers derived from KZN SAM 2005

		1 Agriculture	2 Forestry	3 Fishing	4 Coal Mining	5 Other Mining and Quarrying	6 Food, Beverages & Tobacco	7 Textiles, Clothing and leather	8 Footwear	9 Wood & Paper, Publishing & Printing	10 Coke, Petroleum, Chemicals, Rubber	11 Other non-metallic Mineral Products	12 Basic Metals, Machinery &Equipment	13 Electrical Machinery and Apparatus	14 Radio, television, Watches & Clocks	15 Transport Equipment	16 Furniture & other Manufacturing Products	17 Electricity and Gas	18 Water	19 Construction	20 Wholesales	21 Retail Trade	22 Motor Trade, Repair of Motor Vehicles	23 Hotels and Restaurants	24 Transport	25 Post and Telecommunication	26 Finance	27 Insurance	28 Real Estate	29 Business Services	30 General Government Services
1	Agriculture	1.1358	0.1250	0.2407	0.0059	0.0078	0.4489	0.1322	0.1030	0.1851	0.0333	0.0172	0.0085	0.0052	0.0029	0.0222	0.0618	0.0064	0.0054	0.0152	0.0300	0.0320	0.0041	0.2084	0.0230	0.0173	0.0382	0.0162	0.0115	0.0504	0.0298
2	Forestry	0.0104	1.0116	0.0059	0.0019	0.0026	0.0058	0.0915	0.0283	0.0110	0.0234	0.0074	0.0027	0.0016	0.0006	0.0074	0.0067	0.0013	0.0015	0.0030	0.0044	0.0032	0.0011	0.0050	0.0065	0.0046	0.0048	0.0017	0.0027	0.0068	0.0046
3	Fishing	0.0021	0.0007	1.0487	0.0001	0.0001	0.0125	0.0010	0.0010	0.0005	0.0003	0.0001	0.0001	0.0000	0.0000	0.0001	0.0003	0.0001	0.0000	0.0001	0.0004	0.0005	0.0000	0.0042	0.0003	0.0001	0.0003	0.0001	0.0001	0.0009	0.0005
4	Coal Mining	0.0247	0.0223	0.0145	1.0082	0.0147	0.0194	0.0230	0.0227	0.0351	0.0612	0.0210	0.0636	0.0074	0.0031	0.0146	0.0208	0.2190	0.0346	0.0196	0.0155	0.0133	0.0536	0.0266	0.0215	0.0165	0.0179	0.0067	0.0105	0.0163	0.0140
5	Other Mining and Quarrying	0.0214	0.0216	0.0096	0.0065	1.0087	0.0138	0.0149	0.0133	0.0291	0.0425	0.0148	0.0738	0.0080	0.0026	0.0194	0.0164	0.0120	0.0066	0.0924	0.0118	0.0108	0.1010	0.0119	0.0160	0.0097	0.0126	0.0046	0.0117	0.0143	0.0119
6	Food, Beverages & Tobacco	0.1890	0.0647	0.5113	0.0048	0.0064	1.3222	0.0947	0.0978	0.0478	0.0217	0.0095	0.0048	0.0024	0.0014	0.0095	0.0198	0.0066	0.0033	0.0082	0.0215	0.0228	0.0018	0.4388	0.0225	0.0095	0.0215	0.0075	0.0082	0.0382	0.0277
7	Textiles, Clothing and leather	0.0437	0.0339	0.0471	0.0079	0.0095	0.0213	1.3162	0.3605	0.0582	0.0165	0.0180	0.0049	0.0070	0.0029	0.0732	0.0452	0.0052	0.0037	0.0144	0.0162	0.0156	0.0007	0.0227	0.0218	0.0367	0.0201	0.0074	0.0125	0.0208	0.0163
8	Footwear	0.0007	0.0006	0.0007	0.0006	0.0007	0.0004	0.0104	1.0529	0.0008	0.0004	0.0003	0.0001	0.0001	0.0000	0.0006	0.0006	0.0002	0.0001	0.0006	0.0004	0.0004	-0.0001	0.0004	0.0026	0.0005	0.0005	0.0002	0.0002	0.0006	0.0018
9	Wood and Paper, Publishing and Printing	0.0501	0.3516	0.0359	0.0115	0.0174	0.0617	0.1488	0.0708	1.5647	0.0488	0.0374	0.0191	0.0112	0.0087	0.0220	0.2133	0.0133	0.0182	0.0628	0.1128	0.1083	0.0099	0.0516	0.0542	0.0795	0.1866	0.0965	0.0326	0.0925	0.0477
10	Coke, Petroleum, Chemicals, Rubber and Plastic	0.3897	0.2608	0.1504	0.0851	-0.1197	0.2350	0.2479	0.2588	0.4261	1.4388	0.1761	0.1473	0.0705	0.0252	0.1556	0.2053	0.0556	0.0790	0.1132	0.1416	0.1196	0.0619	0.1822	0.3092	0.1318	0.1697	0.0596	0.1015	0.1491	0.1414
11	Other non-metallic Mineral Products	0.0169	0.0171	0.0105	0.0071	0.0077	0.0170	0.0182	0.0175	0.0227	0.0271	1.0560	0.0105	0.0085	0.0024	0.0215	0.0167	0.0082	0.0065	0.0434	0.0134	0.0120	0.0050	0.0319	0.0177	0.0078	0.0122	0.0042	0.0183	0.0123	0.0110
12	Basic Metals, Machinery and Equipment	0.1653	0.1952	0.0789	0.0763	0.0931	0.1179	0.1451	0.1292	0.3159	0.2500	0.1155	1.5153	0.1059	0.0384	0.2145	0.2108	0.0967	0.0863	0.3556	0.0965	0.0913	0.4294	0.0958	0.1143	0.1106	0.1084	0.0413	0.0752	0.1146	0.0910
13	Electrical Machinery and Apparatus	0.0116	0.0138	0.0071	0.0120	0.0105	0.0080	0.0094	0.0082	0.0174	0.0114	0.0061	0.0453	1.0440	0.0576	0.0198	0.0125	0.0710	0.0205	0.0483	0.0110	0.0101	0.0242	0.0141	0.0149	0.0227	0.0148	0.0046	0.0126	0.0132	0.0120
14	Radio, Television, Watches and Clocks	0.0028	0.0031	0.0028	0.0035	0.0043	0.0035	0.0049	0.0049	0.0051	0.0039	0.0023	0.0028	0.0017	1.0991	0.0019	0.0036	0.0022	0.0110	0.0039	0.0166	0.0159	0.0009	0.0093	0.0102	0.1593	0.0398	0.0120	0.0084	0.0377	0.0266
15	Transport Equipment	0.0809	0.0875	0.0910	0.0331	0.0466	0.0474	0.0493	0.0332	0.0586	0.0243	0.0416	0.0206	0.0342	0.0070	1.4809	0.0385	0.0213	0.0077	0.0281	0.0284	0.0275	-0.0001	0.0288	0.1606	0.0352	0.0413	0.0154	0.0252	0.0275	0.0793
16	Furniture and other Manufacturing Products	0.0031	0.0603	0.0025	0.0020	0.0031	0.0031	0.0098	0.0051	0.0283	0.0052	0.0026	0.0018	0.0010	0.0080	0.0014	1.2235	0.0005	0.0226	0.0086	0.0099	0.0096	0.0006	0.0076	0.0142	0.0096	0.0629	0.0162	0.0024	0.0158	0.0088
17	Electricity and Gas	0.0324	0.0355	0.0299	0.0152	0.0271	0.0293	0.0345	0.0329	0.0519	0.0429	0.0206	0.0457	0.0071	0.0050	0.0125	0.0335	1.0911	0.0677	0.0120	0.0273	0.0257	0.0347	0.0753	0.0372	0.0415	0.0383	0.0153	0.0194	0.0208	0.0189
18	Water	0.0133	0.0146	0.0145	0.0021	0.0081	0.0122	0.0108	0.0100	0.0170	0.0111	0.0044	0.0021	0.0011	0.0010	0.0022	0.0116	0.0111	1.5102	0.0018	0.0081	0.0076	-0.0003	0.0320	0.0115	0.0098	0.0208	0.0058	0.0162	0.0063	0.0079
19	Construction	0.0122	0.0254	0.0134	0.0076	0.0120	0.0077	0.0088	0.0072	0.0097	0.0064	0.0035	0.0042	0.0010	0.0011	0.0016	0.0055	0.0987	0.0067	1.2482	0.0277	0.0270	0.0010	0.0215	0.0206	0.0088	0.0235	0.0097	0.0684	0.0146	0.0142
20	Wholesales	0.0075	0.0078	0.0109	0.0052	0.0069	0.0063	0.0057	0.0062	0.0067	0.0049	0.0031	0.0032	0.0009	0.0009	0.0014	0.0037	0.0031	0.0020	0.0025	1.0344	0.0341	0.0006	0.0069	0.0222	0.0482	0.0210	0.0072	0.0085	0.0241	0.0078
21	Retail Trade	0.0061	0.0063	0.0068	0.0026	0.0043	0.0050	0.0045	0.0043	0.0050	0.0032	0.0020	0.0019	0.0006	0.0007	0.0008	0.0028	0.0019	0.0013	0.0026	0.0273	1.0271	0.0008	0.0055	0.0193	0.0426	0.0321	0.0054	0.0058	0.0208	0.0065
22	Motor Trade, Repair of Motor Vehicles	0.0006	0.0006	0.0004	0.0004	0.0006	0.0006	0.0004	0.0004	0.0005	0.0004	0.0002	0.0002	0.0001	0.0001	0.0001	0.0003	0.0002	0.0001	0.0003	0.0030	0.0030	1.0000	0.0006	0.0022	0.0047	0.0048	0.0005	0.0005	0.0023	0.0007
23	Hotels and Restaurants	0.0031	0.0034	0.0033	0.0023	0.0040	0.0026	0.0028	0.0027	0.0038	0.0027	0.0017	0.0016	0.0004	0.0004	0.0006	0.0023	0.0047	0.0021	0.0004	0.0104	0.0103	0.0002	1.0039	0.0216	0.0031	0.0144	0.0038	0.0032	0.0185	0.0095
24	Transport	0.1004	0.1111	0.1103	0.0869	-0.1623	0.0567	0.0414	0.0316	0.0954	0.0494	0.0362	0.0246	0.0060	0.0043	0.0077	0.0671	0.0284	0.0242	-0.0413	0.0734	0.0715	-0.0276	0.0360	1.1310	0.0875	0.0804	0.0249	0.0053	0.0639	0.0289
25	Post and Telecommunication	0.0114	0.0129	0.0117	0.0080	0.0137	0.0130	0.0172	0.0169	0.0213	0.0151	0.0090	0.0111	0.0029	0.0029	0.0041	0.0118	0.0100	0.0106	0.0226	0.1164	0.1158	0.0058	0.0328	0.0534	1.3793	0.1209	0.0381	0.0345	0.1033	0.0374
26	Finance	0.0051	0.0058	0.0056	0.0014	0.0023	0.0048	0.0054	0.0049	0.0074	0.0035	0.0021	0.0030	0.0009	0.0011	0.0019	0.0038	0.0066	0.0066	0.0019	0.0077	0.0075	0.0020	0.0066	0.0049	0.0046	-1.1683	0.0123	0.0225	0.0071	0.0053
27	Insurance	0.0276	0.0276	0.0309	0.0081	0.0180	0.0161	0.0188	0.0183	0.0121	0.0110	0.0061	0.0046	0.0010	0.0006	0.0008	0.0074	0.0221	-0.0080	0.0250	0.0693	0.0690	-0.0013	0.0191	0.1026	0.0120	0.5478	1.3736	-0.0169	0.0450	0.0166
28	Real Estate	0.0118	0.0143	0.0100	0.0056	0.0083	0.0150	0.0272	0.0267	0.0337	0.0235	0.0131	0.0204	0.0052	0.0075	0.0073	0.0160	0.0040	0.0053	0.0174	0.0825	0.0813	0.0151	0.1079	0.0314	0.0324	0.1501	0.0519	1.0059	0.0290	
29	Business Services	0.0267	0.0289	0.0259	0.0167	0.0233	0.0440	0.0622	0.0630	0.0625	0.0511	0.0300	0.0331	0.0099	0.0091	0.0142	0.0324	0.0131	0.0119	0.0579	0.0675	0.0652	0.0216	0.0857	0.0656	0.0278	0.2301	0.0801	0.0430	1.0734	0.0506
30	General Government Services	0.0439	0.0454	0.0479	0.0355	0.0505	0.0557	0.0841	0.0859	0.0669	0.0508	0.0303	0.0211	0.0085	0.0097	0.0132	0.0342	0.0111	0.0079	0.0090	0.0260	0.0237	0.0063	0.0408	0.0443	0.0270	0.0715	0.0216	0.0372	0.0374	1.1452
31	Agriculture	1.0690	0.1179	0.2267	0.0056	0.0075	0.4225	0.1245	0.0970	0.1743	0.0314	0.0162	0.0080	0.0049	0.0027	0.0209	0.0582	0.0071	0.0052	0.0282	0.0285	0.0304	0.0039	0.1964	0.0218	0.0164	0.0362	0.0154	0.0116	0.0476	0.0282
32	Forestry	0.0101	0.9816	0.0057	0.0019	0.0026	0.0057	0.0888	0.0275	0.0110	0.0227	0.0071	0.0027	0.0016	0.0006	0.0072	0.0065	0.0014	0.0015	0.0051	0.0043	0.0032	0.0010	0.0049	0.0064	0.0045	0.0047	0.0017	0.0028	0.0066	0.0044
33	Fishing	0.0020	0.0006	1.0110	0.0001	0.0001	0.0120	0.0009	0.0010	0.0005	0.0003	0.0001	0.0001	0.0000	0.0000	0.0001	0.0003	0.0001	0.0000	0.0001	0.0004	0.0005	0.0000	0.0040	0.0003	0.0001	0.0003	0.0001	0.0001	0.0008	0.0004
34	Coal Mining	0.0062	0.0056	0.0037	0.2538	0.0037	0.0049	0.0058	0.0057	0.0089	0.0154	0.0053	0.0160	0.0019	0.0008	0.0037	0.0052	0.0553	0.0087	0.0064	0.0040	0.0034	0.0135	0.0077	0.0055	0.0042	0.0046	0.0017	0.0029	0.0043	0.0036
35	Other Mining and Quarrying	0.0145	0.0148	0.0066	0.0159	-0.1242	0.0094	0.0102	0.0092	0.0198	0.0289	0.0101	0.0501	0.0054	0.0018	0.0131	0.0120	0.0111	0.0048	0.0686	0.0082	0.0075	0.0675	0.0089	0.0110	0.0067	0.0089	0.0032	0.0086	0.0101	0.0082
36	Food, Beverages & Tobacco	0.1622	0.0570	0.4256	0.0055	0.0075	1.0974	0.0832	0.0858	0.0451	0.0259	0.0101	0.0063	0.0028	0.0018	0.0092	0.0239	0.0064	0.0037	0.0098	0.0323	0.0427	0.0027	0.3681	0.0235	0.0112	0.0296	0.0102	0.0110	0.0748	0.0407
37	Textiles, Clothing and Leather	0.0372	0.0291	0.0383	0.0072	0.0089	0.0192	1.1253	0.2832	0.0502	0.0233	0.0159	0.0055	0.0061	0.0026	0.0584	0.0408	0.0047	0.0037	0.0131	0.0153	0.0146	0.0014	0.0207	0.0204	0.0301	0.0218	0.0079	0.0115	0.0383	0.0195
38	Footwear	0.0006	0.0005	0.0006	0.0005	0.0006	0.0004	0.0085	0.8494	0.0007	0.0004	0.0002	0.0001	0.0001	0.0000	0.0005	0.0005	0.0002	0.0001	0.0005	0.0007	0.0009	-0.0001	0.0004	0.0022	0.0005	0.0006	0.0002	0.0005	0.0012	0.0015
39	Wood and Paper, Publishing and Printing	0.0366	0.2136	0.0269	0.0087	0.0128	0.0407	0.2022	0.0757	0.9143	0.0416	0.0296	0.0137	0.0080	0.0064	0.0206	0.2181	0.0090	0.0137	0.0406	0.0746	0.0674	0.0069	0.0362	0.0384	0.0517	0.1220	0.0602	0.0239	0.0827	0.0382
40	Coke, Petroleum, Chemicals, Rubber and Plastic	0.2902	0.1962	0.1156	0.0653	0.0915	0.1807	0.1937	0.1988	0.3200	1.0572	0.2960	0.1116	0.0536	0.0196	0.1182	0.1553	0.0430	0.0596	0.0928	0.1514	0.0950	0.0473	0.1414	0.2340	0.1017	0.1414	0.0495	0.0850	0.1702	0.1410
41	Other non-metallic Mineral Products	0.0200	0.0153	0.0088	0.0052	0.0068	0.0138	0.0160	0.0152	0.0233	0.0657	0.2247	0.0089	0.0079	0.0039	0.0120	0.0215	0.0043	0.0050	0.0142	0.0118	0.0080	0.0039	0.0147	0.0172	0.0079	0.0114	0.0039	0.0084	0.0133	0.0094
42	Basic Metals, Machinery and Equipment	0.1229	0.1453	0.0593	0.0569	0.0696	0.0884	0.1092	0.0975	0.2356	0.1870	0.0859	1.1112	0.0837	0.0289	0.1581	0.1618	0.0717	0.0640	0.2622	0.0761	0.0871	0.3152	0.0732	0.0865	0.0832	0.0863	0.0325	0.0614	0.1038	0.0814
43	Electrical Machinery and Apparatus	0.0145	0.0170	0.0075	0.0078	0.0089	0.0104	0.0127	0.0113	0.0263	0.0211	0.0097	0.1151	0.1917	0.0133	0.0252	0.0191	0.0195	0.0099	0.0341	0.0117	0.0120	0.0346	0.0100	0.0120	0.0124	0.0120	0.0043	0.0081	0.0164	0.0104
44	Radio, Television, Watches and Clocks	0.0009	0.0011	0.0009	0.0010	0.0012	0.0011	0.0015	0.0015	0.0016	0.0013	0.0007	0.0011	0.0005	0.2716	0.0009	0.0031	0.0006	0.0028	0.0012	0.0058	0.0042	0.0004	0.0026	0.0028	0.0396	0.0106	0.0032	0.0022	0.0119	0.0073
45	Transport Equipment	0.0594	0.0649	0.0650	0.0248	0.0344	0.0356	0.0446	0.0282	0.0471	0.0220	0.0696	0.0308	0.0679	0.0093	1.1099	0.0321	0.0224	0.0077	0.0709	0.0245	0.0237	0.0054	0.0260	0.1144	0.0280	0.0356	0.0137	0.0452	0.0233	0.0619
46	Furniture and other Manufacturing Products	0.0216	0.1488	0.0150	0.0056	0.0084	0.0246	0.0622	0.0300	0.5608	0.0275	0.0155	0.0091	0.0123	0.0073	0.0133	0.4824	0.0059	0.0160	0.0273	0.0452	0.0434	0.0044	0.0235	0.0273	0.0331	0.0932	0.0415	0.0234	0.0404	0.0242
47	Electricity and Gas	0.0301	0.0331	0.0278	0.0142	0.0252	0.0272	0.0320	0.0305	0.0481	0.0398	0.0191	0.0424	0.0065	0.0047	0.0116	0.0310	1.0108	0.0627	0.0227	0.0256	0.0241	0.0321	0.0702	0.0347	0.0385	0.0357	0.0143	0.0186	0.0194	0.0177
48	Water	0.0127	0.0140	0.0139	0.0020	0.0077	0.0117	0.0104	0.0096	0.0163	0.0107	0.0042	0.0020	0.0010	0.0010	0.0021	0.0111	0.0107	1.4497	0.0017	0.0078	0.0073	-0.0002	0.0307	0.0111	0.0094	0.0200	0.0056	0.0156	0.0060	0.0076
49	Construction	0.0100	0.0205	0.0110	0.0063	0.0098	0.0068	0.0079	0.0066	0.0086	0.0059	0.0033	0.0038	0.0010	0.0010	0.0015	0.0048	0.0782	0.0055	0.9876	0.0240	0.0225	0.0011	0.0184	0.0173	0.0075	0.0221	0.0089	0.0565	0.0268	0.0120
50	Wholesales	0.0066	0.0068	0.0094	0.0045	0.0061	0.0056	0.0053	0.0058	0.0061	0.0044	0.0028	0.0028	0.0008	0.0008	0.0013	0.0034	0.0027	0.0018	0.0022	0.8650	0.0287	0.0006	0.0060	0.0189	0.0405	0.0180	0.0062	0.0073	0.0204	0.0139
51	Retail Trade	0.0054	0.0057	0.0061	0.0024	0.0040	0.0046	0.0044	0.0042	0.0047	0.0031	0.0019	0.0017	0.0006	0.0007	0.0008	0.0026	0.0017	0.0011	0.0022	0.0233	0.8724	0.0007	0.0049	0.0167	0.0363	0.0278	0.0047	0.0051	0.0179	0.0133
52	Motor Trade, Repair of Motor Vehicles	0.0006	0.0006	0.0004	0.0004	0.0005	0.0005	0.0004	0.0004	0.0005	0.0003	0.0002	0.0002	0.0001	0.0001	0.0001	0.0003	0.0002	0.0001	0.0003	0.0029	0.0029	0.9702	0.0006	0.0021	0.0045	0.0046	0.0005	0.0005	0.0022	0.0007
53	Hotels and Restaurants	0.0034	0.0037	0.0037	0.0025	0.0043	0.0031	0.0036	0.0034	0.0043	0.0031	0.0019	0.0017	0.0005	0.0005	0.0007	0.0026	0.0046	0.0021	0.0005	0.0130	0.0103	0.0003	0.9626	0.0212	0.0034	0.0147	0.0040	0.0046	0.0183	0.0201
54	Transport	0.0947	0.1047	0.1041	0.0819	0.1530	0.0535	0.0390	0.0298	0.0899	0.0466	0.0342	0.0232	0.0057	0.0040	0.0072	0.0633	0.0268	0.0229	-0.0389	0.0692	0.0674	-0.0261	0.0339	0.9722	0.0825	0.0758	0.0234	0.0050	0.0603	0.0273
55	Post and Telecommunication	0.0118	0.0133	0.0120	0.0082	0.0139	0.0138	0.0183	0.0180	0.0223	0.0160	0.0095	0.0116	0.0030	0.0030	0.0043	0.0123	0.0101	0.0105	0.0234	0.1144	0.1137	0.0062	0.0340	0.0534	1.3345	0.1230	0.0390	0.0345	0.1285	0.0375
56	Finance	0.0030	0.0034	0.0033	0.0008	0.0013	0.0028	0.0031	0.0028	0.0043	0.0020	0.0012	0.0018	0.0005	0.0006	0.0011	0.0022	0.0039	0.0039	0.0011	0.0045	0.0044	0.0012	0.0038	0.0029	0.0027	-0.0997	0.0073	0.0133	0.0041	0.0020
57	Insurance	0.0269	0.0270	0.0301	0.0080	0.0176	0.0158	0.0184	0.0179	0.0118	0.0108	0.0059	0.0045	0.0009	0.0006	0.0008	0.0073	0.0216	-0.0078	0.0244	0.0676	0.0673	-0.0012	0.0187	0.1001	0.0117	0.5344	1.3400	-0.0165	0.0439	0.0170
58	Real Estate	0.0107	0.0129	0.0091	0.0063	0.0099	0.0129	0.0234	0.0229	0.0294	0.0207	0.0117	0.0176	0.0045	0.0064	0.0060	0.0142	0.0018	0.0029	0.0140	0.0719	0.0709	0.0122	0.0942	0.0462	0.0289	0.1950	0.0422	0.8843	0.0543	0.0290
59	Business Services	0.0211	0.0229	0.0205	0.0133	0.0185	0.0347	0.0491	0.0497	0.0492	0.0401	0.0236	0.0259	0.0078	0.0072	0.0112	0.0255	0.0103	0.0093	0.0452	0.0528	0.0509	0.0169	0.0676	0.0514	0.0218	0.1796	0.0625	0.0337	0.8358	0.0480
60	General Government Services	0.0370	0.0383	0.0404	0.0300	0.0426	0.0470	0.0710	0.0725	0.0564	0.0429	0.0256	0.0178	0.0072	0.0082	0.0112	0.0288	0.0094	0.0067	0.0076	0.0219	0.0200	0.0053	0.0345	0.0374	0.0227	0.0604	0.0183	0.0314	0.0316	0.9666
	Total	4.5920	4.9258	4.8881	2.1107	1.5850	4.8135	4.9167	4.6091	5.9919	4.1032	2.6301	3.7452	1.8428	1.7136	3.6739	3.5786	3.2810	3.7335	3.9468	3.9702	3.8658	3.2803	4.9385	4.2866	4.4568	2.7701	3.7710	2.9877	4.0261	3.5963

#	Agriculture (31)	Forestry (32)	Fishing (33)	Coal Mining (34)	Other Mining & Quarrying (35)	Food, Beverages & Tobacco (36)	Textiles, Clothing & leather (37)	Footwear (38)	Wood & Paper, Publishing (39)	Coke, Petroleum, Chemicals, Rubber & Plastic (40)	Other non-metallic Mineral Products (41)	Basic Metals, Machinery & Equipment (42)	Electrical Machinery and Apparatus (43)	Radio, television, Watches (44)	Transport Equipment (45)	Furniture & other Manufacturing Produts (46)	Electricity and Gas (47)	Water (48)	Construction (49)	Wholesales (50)	Retail Trade (51)	Motor Trade, Repair of Motor Vehicles (52)	Hotels and Restaurants (53)	Transport (54)	Post and Telecom. (55)	Finance (56)	Insurance (57)	Real Estate (58)	Business Services (59)	General Government Services (60)	Sector
1	0.1429	0.1288	0.2497	0.0261	0.0066	0.5430	0.1402	0.1276	0.2675	0.0360	0.0453	0.0094	0.0172	0.0109	0.0318	0.0881	0.0069	0.0056	0.0158	0.0253	0.0250	0.0042	0.2175	0.0242	0.0179	0.0700	0.0166	0.0091	0.0225	0.0196	Agriculture
2	0.0111	0.0119	0.0061	0.0086	0.0022	0.0070	0.1163	0.0351	0.0110	0.0302	0.0107	0.0030	0.0059	0.0024	0.0107	0.0130	0.0014	0.0016	0.0033	0.0035	0.0035	0.0011	0.0052	0.0068	0.0048	0.0095	0.0017	0.0024	0.0026	0.0033	Forestry
3	0.0021	0.0007	0.0505	0.0003	0.0001	0.0151	0.0012	0.0012	0.0007	0.0003	0.0003	0.0001	0.0001	0.0001	0.0002	0.0003	0.0001	0.0002	0.0001	0.0002	0.0002	0.0000	0.0044	0.0003	0.0001	0.0006	0.0001	0.0001	0.0003	0.0002	Fishing
4	0.0261	0.0229	0.0151	0.0376	0.0124	0.0233	0.0251	0.0282	0.0351	0.0808	0.0364	0.0834	0.0324	0.0122	0.0209	0.0421	0.2367	0.0361	0.0214	0.0136	0.0134	0.0553	0.0271	0.0226	0.0171	0.0361	0.0069	0.0097	0.0094	0.0111	Coal Mining
5	0.0227	0.0223	0.0099	0.0298	0.0095	0.0166	0.0153	0.0165	0.0308	0.0560	0.0241	0.0972	0.0340	0.0101	0.0279	0.0322	0.0130	0.0069	0.1157	0.0104	0.0103	0.1042	0.0123	0.0167	0.0100	0.0279	0.0047	0.0110	0.0076	0.0096	Other Mining and Quarrying
6	0.1999	0.0667	0.5304	0.0213	0.0054	0.3898	0.1145	0.1212	0.0651	0.0248	0.0236	0.0055	0.0086	0.0053	0.0136	0.0292	0.0071	0.0034	0.0071	0.0179	0.0177	0.0019	0.4579	0.0237	0.0098	0.0405	0.0077	0.0069	0.0226	0.0190	Food, Beverages & Tobacco
7	0.0463	0.0349	0.0488	0.0346	0.0080	0.0257	0.4016	0.4468	0.0403	0.0146	0.0568	0.0045	0.0098	0.0104	0.1063	0.0995	0.0057	0.0038	0.0131	0.0176	0.0174	0.0007	0.0237	0.0229	0.0380	0.0398	0.0076	0.0098	0.0108	0.0146	Textiles, Clothing and leather
8	0.0007	0.0006	0.0007	0.0026	0.0006	0.0005	0.0134	0.0656	0.0006	0.0004	0.0009	0.0001	0.0002	0.0002	0.0009	0.0012	0.0002	0.0001	0.0007	0.0004	0.0004	-0.0001	0.0004	0.0028	0.0006	0.0010	0.0002	0.0002	0.0003	0.0020	Footwear
9	0.0531	0.3623	0.0372	0.0516	0.0146	0.0745	0.1067	0.0878	0.7574	0.0485	0.1254	0.0217	0.0391	0.0335	0.0303	0.3666	0.0144	0.0189	0.0771	0.1268	0.1253	0.0102	0.0539	0.0569	0.0822	0.1330	0.0988	0.0295	0.0811	0.0435	Wood and Paper, Publishing and Printing
10	0.4134	0.2688	0.1560	0.3793	0.1008	0.2830	0.2584	0.3208	0.5022	0.5687	0.3750	0.1676	0.3211	0.0969	0.2230	0.3901	0.0600	0.0823	0.1319	0.1326	0.1307	0.0638	0.1901	0.3259	0.1363	0.1460	0.0608	0.0985	0.1024	0.1289	Coke, Petroleum, Chemicals, Rubber and Plastic
11	0.0179	0.0176	0.0109	0.0307	0.0064	0.0205	0.0204	0.0217	0.0204	0.0221	0.2496	0.0105	0.0352	0.0074	0.0308	0.0311	0.0089	0.0068	0.0535	0.0135	0.0134	0.0052	0.0332	0.0184	0.0081	0.0322	0.0043	0.0190	0.0092	0.0104	Other non-metallic Mineral Products
12	0.1752	0.2012	0.0818	0.3352	0.0784	0.1419	0.1514	0.1602	0.2738	0.3183	0.2596	0.6530	0.4869	0.1506	0.3077	0.4508	0.1044	0.0899	0.4363	0.0917	0.0905	0.4425	0.0997	0.1198	0.1143	0.1222	0.0421	0.0648	0.0755	0.0764	Basic Metals, Machinery and Equipment
13	0.0123	0.0143	0.0074	0.0515	0.0089	0.0096	0.0101	0.0102	0.0148	0.0141	0.0140	0.0383	0.2411	0.2324	0.0272	0.0253	0.0767	0.0213	0.0593	0.0110	0.0108	0.0249	0.0145	0.0156	0.0234	0.0326	0.0047	0.0128	0.0098	0.0118	Electrical Machinery and Apparatus
14	0.0029	0.0031	0.0029	0.0152	0.0036	0.0042	0.0057	0.0061	0.0054	0.0048	0.0072	0.0029	0.0088	0.4008	0.0026	0.0055	0.0024	0.0115	0.0049	0.0188	0.0185	0.0010	0.0097	0.0106	0.1648	0.0728	0.0123	0.0092	0.0405	0.0301	Radio, Television, Watches and Clocks
15	0.0858	0.0901	0.0944	0.1475	0.0392	0.0573	0.0525	0.0411	0.0520	0.0280	0.0538	0.0171	0.0261	0.0239	0.7006	0.0810	0.0231	0.0081	-0.0001	0.0312	0.0307	-0.0001	0.0300	0.1702	0.0364	0.0750	0.0154	0.0087	0.0256	0.0868	Transport Equipment
16	0.0033	0.0622	0.0026	0.0091	0.0026	0.0037	0.0107	0.0063	0.0156	0.0061	0.0072	0.0021	0.0031	0.0323	0.0018	0.0554	0.0006	0.0236	0.0107	0.0113	0.0111	0.0006	0.0080	0.0150	0.0099	0.1075	0.0166	0.0019	0.0183	0.0095	Furniture and other Manufacturing Products
17	0.0344	0.0366	0.0311	0.0698	0.0229	0.0353	0.0386	0.0408	0.0467	0.0541	0.0552	0.0594	0.0303	0.0197	0.0177	0.0714	0.0985	0.0705	0.0140	0.0287	0.0282	0.0358	0.0783	0.0390	0.0429	0.0767	0.0157	0.0198	0.0154	0.0169	Electricity and Gas
18	0.0141	0.0150	0.0150	0.0109	0.0068	0.0147	0.0122	0.0124	0.0140	0.0142	0.0098	0.0024	0.0040	0.0041	0.0030	0.0256	0.0120	0.5315	0.0021	0.0086	0.0086	-0.0003	0.0334	0.0119	0.0101	0.0459	0.0059	0.0178	0.0051	0.0078	Water
19	0.0129	0.0261	0.0139	0.0345	0.0101	0.0094	0.0101	0.0089	0.0099	0.0079	0.0107	0.0053	0.0045	0.0043	0.0023	0.0113	0.1066	0.0070	0.3130	0.0321	0.0315	0.0010	0.0221	0.0203	0.0091	0.0855	0.0100	0.0762	0.0111	0.0151	Construction
20	0.0080	0.0080	0.0113	0.0229	0.0058	0.0076	0.0065	0.0077	0.0071	0.0060	0.0099	0.0040	0.0039	0.0036	0.0020	0.0075	0.0034	0.0021	0.0033	0.0407	0.0399	0.0007	0.0072	0.0234	0.0499	0.0411	0.0074	0.0093	0.0279	0.0078	Wholesales
21	0.0064	0.0065	0.0071	0.0118	0.0036	0.0060	0.0052	0.0053	0.0053	0.0038	0.0063	0.0023	0.0028	0.0028	0.0011	0.0057	0.0020	0.0013	0.0033	0.0323	0.0318	0.0008	0.0057	0.0204	0.0440	0.0581	0.0055	0.0063	0.0242	0.0066	Retail Trade
22	0.0007	0.0007	0.0004	0.0017	0.0005	0.0007	0.0005	0.0005	0.0006	0.0004	0.0007	0.0002	0.0003	0.0003	0.0001	0.0006	0.0002	0.0002	0.0004	0.0035	0.0035	0.0000	0.0006	0.0023	0.0048	0.0084	0.0006	0.0006	0.0027	0.0008	Motor Trade, Repair of Motor Vehicles
23	0.0033	0.0035	0.0035	0.0104	0.0034	0.0032	0.0032	0.0033	0.0035	0.0032	0.0054	0.0020	0.0018	0.0015	0.0008	0.0049	0.0051	0.0021	0.0006	0.0122	0.0120	0.0032	0.0041	0.0228	0.0032	0.0265	0.0039	0.0035	0.0230	0.0106	Hotels and Restaurants
24	0.1065	0.1145	0.1145	0.4008	-0.1366	0.0685	0.0440	0.0392	0.0742	0.0578	0.1290	0.0319	0.0226	0.0159	0.0104	0.1505	0.0307	0.0252	-0.0465	0.0831	0.0819	-0.0285	0.0377	0.0328	0.0905	0.1380	0.0254	0.0037	0.0681	0.0273	Transport
25	0.0121	0.0133	0.0121	0.0365	0.0115	0.0157	0.0194	0.0209	0.0226	0.0185	0.0281	0.0138	0.0131	0.0112	0.0057	0.0237	0.0109	0.0110	0.0287	0.1377	0.1357	0.0060	0.0342	0.0559	0.3923	0.2272	0.0390	0.0381	0.1150	0.0394	Post and Telecommunication
26	0.0054	0.0060	0.0058	0.0065	0.0019	0.0058	0.0059	0.0061	0.0084	0.0042	0.0064	0.0037	0.0041	0.0042	0.0028	0.0074	0.0071	0.0069	0.0022	0.0088	0.0087	0.0021	0.0068	0.0047	0.0048	-1.2587	0.0127	0.0251	0.0077	0.0031	Finance
27	0.0292	0.0285	0.0320	0.0385	0.0151	0.0195	0.0228	0.0226	0.0115	0.0135	0.0188	0.0059	0.0040	0.0021	0.0011	0.0155	0.0239	-0.0083	0.0318	0.0818	0.0807	-0.0013	0.0199	0.1092	0.0124	0.9137	0.3830	-0.0195	0.0538	0.0175	Insurance
28	0.0125	0.0147	0.0103	0.0252	0.0070	0.0181	0.0303	0.0331	0.0406	0.0290	0.0392	0.0254	0.0246	0.0299	0.0104	0.0294	0.0043	0.0056	0.0216	0.0961	0.0948	0.0156	0.1126	0.0332	0.0335	0.0570	0.0532	0.0055	0.0729	0.0290	Real Estate
29	0.0282	0.0298	0.0269	0.0743	0.0196	0.0531	0.0716	0.0781	0.0707	0.0626	0.0933	0.0405	0.0464	0.0360	0.0201	0.0622	0.0142	0.0124	0.0729	0.0758	0.0746	0.0223	0.0894	0.0687	0.0287	0.1165	0.0821	0.0462	0.0794	0.0526	Business Services
30	0.0464	0.0468	0.0497	0.1584	0.0425	0.0673	0.0992	0.1065	0.0761	0.0618	0.0955	0.0250	0.0390	0.0384	0.0187	0.0656	0.0120	0.0082	0.0122	0.0261	0.0258	0.0065	0.0426	0.0462	0.0279	0.0449	0.0222	0.0399	0.0333	0.1660	General Government Services
31	1.1347	0.1215	0.2351	0.0249	0.0063	0.5111	0.1320	0.1202	0.2519	0.0340	0.0427	0.0089	0.0162	0.0103	0.0300	0.0830	0.0077	0.0054	0.0184	0.0241	0.0238	0.0040	0.2049	0.0230	0.0170	0.0668	0.0157	0.0094	0.0213	0.0186	Agriculture
32	0.0108	1.0117	0.0060	0.0084	0.0022	0.0068	0.1129	0.0340	0.0109	0.0293	0.0104	0.0030	0.0057	0.0023	0.0104	0.0127	0.0015	0.0016	0.0037	0.0035	0.0035	0.0011	0.0051	0.0067	0.0047	0.0094	0.0017	0.0025	0.0026	0.0032	Forestry
33	0.0021	0.0007	1.0487	0.0003	0.0001	0.0145	0.0011	0.0012	0.0007	0.0003	0.0003	0.0001	0.0001	0.0001	0.0001	0.0003	0.0001	0.0002	0.0001	0.0002	0.0002	0.0000	0.0042	0.0003	0.0001	0.0006	0.0001	0.0001	0.0003	0.0002	Fishing
34	0.0066	0.0058	0.0038	1.0095	0.0031	0.0059	0.0063	0.0071	0.0089	0.0204	0.0092	0.0210	0.0082	0.0031	0.0053	0.0106	0.0597	0.0091	0.0058	0.0035	0.0034	0.0139	0.0069	0.0057	0.0043	0.0093	0.0018	0.0026	0.0024	0.0028	Coal Mining
35	0.0154	0.0153	0.0069	0.0205	1.1046	0.0113	0.0105	0.0114	0.0209	0.0381	0.0165	0.0654	0.0231	0.0069	0.0188	0.0220	0.0119	0.0051	0.0786	0.0073	0.0072	0.0696	0.0087	0.0115	0.0069	0.0197	0.0033	0.0078	0.0053	0.0066	Other Mining and Quarrying
36	0.1689	0.0587	0.4415	0.0245	0.0063	1.3276	0.1002	0.1063	0.0603	0.0260	0.0261	0.0072	0.0107	0.0069	0.0132	0.0295	0.0069	0.0039	0.0095	0.0198	0.0196	0.0028	0.3841	0.0248	0.0116	0.0553	0.0104	0.0086	0.0235	0.0207	Food, Beverages & Tobacco
37	0.0394	0.0300	0.0397	0.0315	0.0075	0.0231	1.3154	0.3511	0.0366	0.0165	0.0488	0.0055	0.0108	0.0097	0.0845	0.0816	0.0051	0.0039	0.0126	0.0162	0.0160	0.0014	0.0216	0.0215	0.0311	0.0425	0.0081	0.0093	0.0109	0.0140	Textiles, Clothing and Leather
38	0.0006	0.0005	0.0006	0.0022	0.0005	0.0004	0.0108	1.0530	0.0006	0.0003	0.0008	0.0001	0.0002	0.0002	0.0007	0.0010	0.0002	0.0001	0.0006	0.0004	0.0004	-0.0001	0.0004	0.0023	0.0005	0.0012	0.0002	0.0002	0.0003	0.0017	Footwear
39	0.0387	0.2202	0.0279	0.0390	0.0108	0.0491	0.1007	0.0939	1.4471	0.0356	0.0841	0.0155	0.0274	0.0248	0.0290	0.2293	0.0097	0.0142	0.0494	0.0788	0.0778	0.0071	0.0377	0.0403	0.0535	0.2182	0.0616	0.0201	0.0522	0.0303	Wood and Paper, Publishing and Printing
40	0.3078	0.2022	0.1199	0.2909	0.0770	0.2154	0.2000	0.2464	0.3758	1.4235	0.3208	0.1270	0.2434	0.0751	0.1694	0.2951	0.0464	0.0621	0.1090	0.1057	0.1041	0.0488	0.1514	0.2465	0.1052	0.2864	0.0506	0.0788	0.0828	0.1036	Coke, Petroleum, Chemicals, Rubber and Plastic
41	0.0212	0.0157	0.0091	0.0230	0.0057	0.0164	0.0159	0.0188	0.0258	0.0287	1.0676	0.0096	0.0217	0.0075	0.0164	0.0238	0.0047	0.0052	0.0172	0.0090	0.0088	0.0040	0.0154	0.0180	0.0081	0.0242	0.0040	0.0083	0.0069	0.0081	Other non-metallic Mineral Products
42	0.1303	0.1497	0.0615	0.2500	0.0586	0.1064	0.1141	0.1208	0.2044	0.2361	0.1939	1.4799	0.3598	0.1132	0.2266	0.3336	0.0775	0.0666	0.3217	0.0703	0.0694	0.3249	0.0761	0.0908	0.0861	0.1754	0.0331	0.0491	0.0583	0.0594	Basic Metals, Machinery and Equipment
43	0.0154	0.0176	0.0078	0.0342	0.0075	0.0125	0.0134	0.0140	0.0229	0.0258	0.0219	0.0532	1.2774	0.0521	0.0298	0.0373	0.0211	0.0103	0.0417	0.0092	0.0091	0.0357	0.0104	0.0126	0.0128	0.0246	0.0044	0.0072	0.0078	0.0084	Electrical Machinery and Apparatus
44	0.0009	0.0011	0.0009	0.0042	0.0010	0.0013	0.0017	0.0018	0.0017	0.0015	0.0022	0.0010	0.0024	1.0992	0.0009	0.0018	0.0007	0.0030	0.0015	0.0049	0.0049	0.0004	0.0027	0.0030	0.0409	0.0194	0.0033	0.0024	0.0103	0.0077	Radio, Television, Watches and Clocks
45	0.0630	0.0669	0.0675	0.1102	0.0290	0.0430	0.0423	0.0349	0.0419	0.0250	0.0512	0.0206	0.0346	0.0292	1.4866	0.0640	0.0242	0.0080	0.0235	0.0269	0.0265	0.0056	0.0271	0.1211	0.0290	0.0667	0.0133	0.0109	0.0214	0.0631	Transport Equipment
46	0.0228	0.1534	0.0156	0.0252	0.0071	0.0297	0.0450	0.0372	0.2743	0.0232	0.0498	0.0101	0.0189	0.0274	0.0150	1.1533	0.0063	0.0167	0.0329	0.0508	0.0502	0.0046	0.0245	0.0287	0.0342	0.1647	0.0422	0.0119	0.0371	0.0207	Furniture and other Manufacturing Products
47	0.0319	0.0341	0.0289	0.0649	0.0213	0.0328	0.0359	0.0378	0.0433	0.0502	0.0512	0.0550	0.0281	0.0183	0.0164	0.0662	1.0921	0.0653	0.0246	0.0269	0.0265	0.0331	0.0727	0.0364	0.0398	0.0718	0.0146	0.0190	0.0144	0.0158	Electricity and Gas
48	0.0135	0.0144	0.0144	0.0105	0.0065	0.0141	0.0117	0.0119	0.0135	0.0136	0.0094	0.0023	0.0039	0.0039	0.0029	0.0246	0.0115	1.5102	0.0021	0.0083	0.0082	-0.0002	0.0320	0.0114	0.0097	0.0441	0.0057	0.0170	0.0049	0.0075	Water
49	0.0106	0.0211	0.0114	0.0284	0.0083	0.0082	0.0090	0.0082	0.0089	0.0072	0.0098	0.0048	0.0043	0.0040	0.0021	0.0098	0.0845	0.0057	1.2485	0.0266	0.0262	0.0011	0.0190	0.0171	0.0077	0.0740	0.0092	0.0609	0.0100	0.0127	Construction
50	0.0069	0.0070	0.0098	0.0202	0.0051	0.0068	0.0060	0.0071	0.0064	0.0054	0.0089	0.0035	0.0035	0.0033	0.0018	0.0067	0.0029	0.0018	0.0028	1.0342	0.0336	0.0006	0.0063	0.0199	0.0419	0.0353	0.0063	0.0081	0.0235	0.0076	Wholesales
51	0.0058	0.0059	0.0064	0.0111	0.0033	0.0056	0.0051	0.0052	0.0050	0.0037	0.0060	0.0021	0.0026	0.0027	0.0011	0.0053	0.0018	0.0012	0.0029	0.0276	1.0271	0.0007	0.0051	0.0176	0.0376	0.0503	0.0048	0.0057	0.0208	0.0067	Retail Trade
52	0.0006	0.0006	0.0004	0.0017	0.0005	0.0007	0.0005	0.0005	0.0005	0.0004	0.0007	0.0002	0.0003	0.0003	0.0001	0.0006	0.0002	0.0001	0.0003	0.0034	0.0034	1.0000	0.0006	0.0022	0.0047	0.0082	0.0005	0.0006	0.0026	0.0007	Motor Trade, Repair of Motor Vehicles
53	0.0036	0.0038	0.0038	0.0116	0.0037	0.0037	0.0041	0.0042	0.0042	0.0037	0.0061	0.0022	0.0021	0.0018	0.0010	0.0054	0.0050	0.0021	0.0007	0.0122	0.0120	0.0003	1.0045	0.0224	0.0035	0.0272	0.0041	0.0037	0.0226	0.0118	Hotels and Restaurants
54	0.1005	0.1079	0.1079	0.3780	-0.1288	0.0646	0.0415	0.0369	0.0699	0.0545	0.1216	0.0301	0.0213	0.0150	0.0098	0.1419	0.0289	0.0238	-0.0438	0.0784	0.0772	-0.0269	0.0356	1.1309	0.0383	0.1302	0.0240	0.0034	0.0642	0.0257	Transport
55	0.0125	0.0137	0.0124	0.0373	0.0117	0.0166	0.0207	0.0223	0.0237	0.0196	0.0297	0.0144	0.0139	0.0118	0.0061	0.0245	0.0109	0.0110	0.0297	0.1352	0.1332	0.0064	0.0355	0.0558	1.3801	0.2308	0.0399	0.0381	0.1133	0.0395	Post and Telecommunication
56	0.0032	0.0035	0.0034	0.0037	0.0011	0.0033	0.0034	0.0035	0.0049	0.0025	0.0037	0.0022	0.0024	0.0025	0.0016	0.0043	0.0042	0.0041	0.0012	0.0040	0.0027	0.0012	0.0040	0.0027	0.0028	-0.1595	0.0049	0.0148	0.0045	0.0017	Finance
57	0.0286	0.0278	0.0313	0.0377	0.0148	0.0191	0.0224	0.0221	0.0113	0.0132	0.0184	0.0058	0.0039	0.0021	0.0011	0.0152	0.0233	-0.0081	0.0310	0.0798	0.0787	-0.0013	0.0195	0.1065	0.0121	0.3914	1.3736	-0.0190	0.0525	0.0172	Insurance
58	0.0114	0.0133	0.0095	0.0284	0.0083	0.0156	0.0260	0.0283	0.0348	0.0255	0.0354	0.0219	0.0209	0.0254	0.0085	0.0266	0.0019	0.0030	0.0176	0.0838	0.0827	0.0125	0.0983	0.0286	0.0299	0.4296	0.0433	0.9961	0.0633	0.0258	Real Estate
59	0.0223	0.0236	0.0213	0.0590	0.0156	0.0418	0.0565	0.0616	0.0556	0.0492	0.0733	0.0317	0.0364	0.0283	0.0158	0.0489	0.0111	0.0097	0.0568	0.0592	0.0583	0.0174	0.0699	0.0538	0.0226	0.1253	0.0641	0.0363	1.0621	0.0422	Business Services
60	0.0392	0.0395	0.0419	0.1337	0.0359	0.0568	0.0837	0.0899	0.0642	0.0522	0.0806	0.0211	0.0329	0.0324	0.0158	0.0554	0.0102	0.0069	0.0103	0.0221	0.0218	0.0054	0.0360	0.0390	0.0235	0.0723	0.0187	0.0337	0.0281	1.1401	General Government Services
Total	3.8051	4.0460	4.0333	4.8081	1.6478	4.6046	4.3617	4.4738	5.6151	3.8560	4.1993	3.3638	3.5080	2.8230	3.8531	5.0076	2.4646	2.8477	3.5177	3.2268	3.1956	2.3503	4.1023	3.4440	3.5748	4.2433	2.8371	2.0138	2.8079	2.6016	Total

Table 20: KwaZulu-Natal SAM, 2005 (Total columns only)

Integrated Economic Accounts	Description	Goods and Services	Production	Income Generation	Allocation of primary Income	Secondary Distribution of Income	Use of Income	Total Capital	Total FCF	Financial	Total rest of the world	GDPR - Residuals	Total
		1	2	3	4	5	6	7	8	9	10 & 11		Total
1	Agriculture	0	18,921	0	0	0	1875	149	-	0	651		21,596
	Forestry	0	2,577	0	0	0	0	58	-	0	8		2,643
	Fishing	0	394	0	0	0	0	96	-	0	4		494
	Coal Mining	0	5,680	0	0	0	0	-162	-	0	2,575		8,093
	Other Mining and Quarrying	0	6,266	0	0	0	0	-257	-	0	890		6,899
	Food, Beverages & Tobacco	0	13,399	0	0	0	27215	228	-	0	1,142		41,985
	Textiles, Clothing and leather	0	9,531	0	0	0	5501	75	-	0	7,914		23,021
	Footwear	0	451	0	0	0	490	19	-	0	97		1,057
	Wood & Paper, Publishing & Printing	0	19,332	0	0	0	2318	333	-	0	6,848		28,831
	Coke, Petroleum, Chemicals, Rubber & Plastic	0	50,066	0	0	0	7830	266	5	0	5,311		63,477
	Other non-metallic Mineral Products	0	4,286	0	0	0	0	19	-	0	212		4,517
	Basic Metals, Machinery & Equip.	0	41,590	0	0	0	1891	236	1,319	0	7,351		52,387
	Electrical Machinery & Apparatus	0	4,569	0	0	0	215	15	502	0	11		5,312
	Radio, Television, Matches	0	4,796	0	0	0	1844	54	843	0	829		8,366
	Transport Equipment	0	22,823	0	0	0	8892	127	2,365	0	3,100		37,307
	Furniture & other Manufacturing. Prod.	0	2,793	0	0	0	418	52	82	0	12		3,357
	Electricity and Gas	0	7,845	0	0	0	120	-	-	0	0		7,965
GOODS AND SERVICES	Water	0	3,162	0	0	0	1303	-	-	0	0		4,465
	Construction	0	8,242	0	0	0	0	177	16,825	0	0		25,244
	Wholesales	0	3,626	0	0	0	22140	-	-	0	2,372		28,138
	Retail Trade	0	3,063	0	0	0	16394	-	-	0	1,460		20,917
	Motor Trade, Repair of Vehicles	0	349	0	0	0	6150	100	1,540	0	1,155		9,294
	Hotels and Restaurants	0	2,167	0	0	0	1803	-	-	0	14		3,984
	Transport	0	14,739	0	0	0	6484	21	12,115	0	15,128		48,487
	Post and Telecommunication	0	13,751	0	0	0	3828	7	-	0	4,772		22,358
	Finance	0	10,295	0	0	0	3230	-	-	0	276		13,801
	Insurance	0	16,117	0	0	0	7704	-	-	0	3,826		27,647
	Real Estate	0	9,810	0	0	0	5017	-	1,789	0	4,283		20,899
	Business Services	0	15,996	0	0	0	451	50	-	0	0		16,497
	General Government Services	0	18,802	0	0	0	65634	-	-	0	5,568		90,004
	Trade and transport margins	0	0	0	0	0	0	0	0	0	0		0
	Total use	**0**	**335,438**	**0**	**0**	**0**	**198747**	**1,663**	**37,385**	**0**	**75,808**	**0**	**649,041**
2	Agriculture	18,755	0	0	0	0	0	0	0	0	0	0	18,755
	Forestry	2,370	0	0	0	0	0	0	0	0	0	0	2,370
	Fishing	434	0	0	0	0	0	0	0	0	0	0	434
	Coal Mining	1,963	0	0	0	0	0	0	0	0	0	0	1,963
	Other Mining and Quarrying	4,372	0	0	0	0	0	0	0	0	0	0	4,372

PRODUCTION	Food, Beverages & Tobacco	37,555	0	0	0	0	0	0	0	0	0	0	37,555
	Textiles, Clothing and leather	18,998	0	0	0	0	0	0	0	0	0	0	18,998
	Footwear	884	0	0	0	0	0	0	0	0	0	0	884
	Wood &Paper, Publishing & Printing	20,324	0	0	0	0	0	0	0	0	0	0	20,324
	Coke, Petroleum, Chemicals,…	51,098	0	0	0	0	0	0	0	0	0	0	51,098
	Other non-metallic Mineral Products	3,755	0	0	0	0	0	0	0	0	0	0	3,755
	Basic Metals, Machinery & Equip.	40,427	0	0	0	0	0	0	0	0	0	0	40,427
	Electrical Machinery & Apparatus	5,080	0	0	0	0	0	0	0	0	0	0	5,080
	Radio, Television, Matches	2,209	0	0	0	0	0	0	0	0	0	0	2,209
	Transport Equipment	28,210	0	0	0	0	0	0	0	0	0	0	28,210
	Furniture & other Manufacturing. Prod.	12,371	0	0	0	0	0	0	0	0	0	0	12,371
	Electricity and Gas	7,618	0	0	0	0	0	0	0	0	0	0	7,618
	Water	4,286	0	0	0	0	0	0	0	0	0	0	4,286
	Construction	20,257	0	0	0	0	0	0	0	0	0	0	20,257
	Wholesales	25,652	0	0	0	0	0	0	0	0	0	0	25,652
	Retail Trade	20,283	0	0	0	0	0	0	0	0	0	0	20,283
	Motor Trade, Repair of Vehicles	8,948	0	0	0	0	0	0	0	0	0	0	8,948
	Hotels and Restaurants	4,772	0	0	0	0	0	0	0	0	0	0	4,772
2	Transport	46,883	0	0	0	0	0	0	0	0	0	0	46,883
	Post and Telecommunication	22,062	0	0	0	0	0	0	0	0	0	0	22,062
	Finance	8,259	0	0	0	0	0	0	0	0	0	0	8,259
	Insurance	27,032	0	0	0	0	0	0	0	0	0	0	27,032
	Real Estate	24,778	0	0	0	0	0	0	0	0	0	0	24,778
	Business Services	13,516	0	0	0	0	0	0	0	0	0	0	13,516
	General Government Services	75,966	0	0	0	0	0	0	0	0	0	0	75,966
	Total supply	**559,118**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**559,118**
	Net operating surplus	0	72655	0	0	0	0	0	0	0	0	0	72,655
	A: Legislators (4)	0	1836	0	0	0	0	0	0	0	2	0	1,839
	A: Professionals (4)	0	4450	0	0	0	0	0	0	0	6	0	4,456
	A: Technicians (3)	0	2304	0	0	0	0	0	0	0	3	0	2,307
	A: Clerks (2)	0	3346	0	0	0	0	0	0	0	5	0	3,350
	A: Service workers (2)	0	8633	0	0	0	0	0	0	0	12	0	8,645
	A: Skilled agricultural workers (2)	0	807	0	0	0	0	0	0	0	1	0	808
	A: Craft workers (2)	0	6520	0	0	0	0	0	0	0	9	0	6,528
	A: Plant & machine operators (2)	0	5482	0	0	0	0	0	0	0	7	0	5,490
	A: Elementary occupations (1)	0	5705	0	0	0	0	0	0	0	7	0	5,713
	A: Domestic workers (1)	0	1500	0	0	0	0	0	0	0	2	0	1,502
	A: Occupation unspecified (1)	0	3512	0	0	0	0	0	0	0	5	0	3,516
	Total Africans	**0**	**44096**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**59**	**0**	**44,155**
	C: Legislators (4)	0	768	0	0	0	0	0	0	0	1	0	769
3	C: Professionals (4)	0	1106	0	0	0	0	0	0	0	2	0	1,108
	C: Technicians (3)	0	1044	0	0	0	0	0	0	0	1	0	1,046
	C: Clerks (2)	0	1623	0	0	0	0	0	0	0	2	0	1,625
	C: Service workers (2)	0	1832	0	0	0	0	0	0	0	3	0	1,835
	C: Skilled agricultural workers (2)	0	175	0	0	0	0	0	0	0	0	0	176
	C: Craft workers (2)	0	1841	0	0	0	0	0	0	0	3	0	1,844
	C: Plant &machine operators (2)	0	1109	0	0	0	0	0	0	0	2	0	1,111
	C: Elementary occupations (1)	0	1851	0	0	0	0	0	0	0	2	0	1,854

	C: Domestic workers (1)	0	267	0	0	0	0	0	0	0	0	0	268
	C: Occupation unspecified (1)	0	999	0	0	0	0	0	0	0	1	0	1,001
	Total coloureds	**0**	**12617**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**17**	**0**	**12,634**
	I: Legislators (4)	0	601	0	0	0	0	0	0	0	1	0	601
	I: Professionals (4)	0	813	0	0	0	0	0	0	0	1	0	814
	I: Technicians (3)	0	696	0	0	0	0	0	0	0	1	0	697
	I: Clerks (2)	0	842	0	0	0	0	0	0	0	1	0	843
	I: Service workers (2)	0	721	0	0	0	0	0	0	0	1	0	722
	I: Skilled agricultural workers (2)	0	35	0	0	0	0	0	0	0	0	0	35
	I: Craft workers (2)	0	537	0	0	0	0	0	0	0	1	0	538
	I: Plant and machine operators (2)	0	383	0	0	0	0	0	0	0	1	0	384
	I: Elementary occupations (1)	0	137	0	0	0	0	0	0	0	0	0	137
	I: Domestic workers (1)	0	18	0	0	0	0	0	0	0	0	0	18
	I: Occupation unspecified (1)	0	877	0	0	0	0	0	0	0	1	0	878
	Total Indians	**0**	**5661**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**0**	**5,669**
GENERATION OF INCOME	W: Legislators (4)	0	10117	0	0	0	0	0	0	0	14	0	10,131
	W: Professionals (4)	0	9817	0	0	0	0	0	0	0	13	0	9,830
	W: Technicians (3)	0	8336	0	0	0	0	0	0	0	11	0	8,347
	W: Clerks (2)	0	6601	0	0	0	0	0	0	0	9	0	6,610
	W: Service workers (2)	0	6820	0	0	0	0	0	0	0	9	0	6,830
	W: Skilled agricultural workers (2)	0	582	0	0	0	0	0	0	0	1	0	583
	W: Craft workers (2)	0	4753	0	0	0	0	0	0	0	7	0	4,760
	W: Plant & machine operators (2)	0	1630	0	0	0	0	0	0	0	2	0	1,632
	W: Elementary occupations (1)	0	733	0	0	0	0	0	0	0	1	0	734
	W: Domestic workers (1)	0	55	0	0	0	0	0	0	0	0	0	55
	W: Occupation unspecified (1)	0	5659	0	0	0	0	0	0	0	7	0	5,666
	Total whites	**0**	**55103**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**74**	**0**	**55,177**
	T: Legislators (4)	0	13376	0	0	0	0	0	0	0	18	0	13,394
	T: Professionals (4)	0	16265	0	0	0	0	0	0	0	22	0	16,287
	T: Technicians (3)	0	12434	0	0	0	0	0	0	0	17	0	12,451
	T: Clerks (2)	0	12470	0	0	0	0	0	0	0	17	0	12,487
	T: Service workers (2)	0	18070	0	0	0	0	0	0	0	25	0	18,095
3	T: Skilled agricultural workers (2)	0	1605	0	0	0	0	0	0	0	1	0	1,606
	T: Craft workers (2)	0	13701	0	0	0	0	0	0	0	19	0	13,720
	T: Plant & machine operators (2)	0	8631	0	0	0	0	0	0	0	12	0	8,642
	T: Elementary occupations (1)	0	8455	0	0	0	0	0	0	0	11	0	8,466
	T: Domestic workers (1)	0	1846	0	0	0	0	0	0	0	2	0	1,849
	T: Occupation unspecified (1)	0	10624	0	0	0	0	0	0	0	14	0	10,638
	Total occupation (skill level)	**0**	**117,477**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**158**	**0**	**117,635**
	Total economy	**0**	**190,132**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**158**	**0**	**190,290**
4 ALLOCATION OF PRIMARY	Non-financial corporations	0	0	35,440	11,692	0	0	0	0	0	306	0	47,437
	Financial corporations	0	0	6,887	54,318	0	0	0	0	0	1,037	0	62,243
	Government	27,607	0	4,406	1,803	0	0	0	0	0	0	0	33,816
	Households & NPISH	0	0	142,830	47,972	0	0	0	0	0	971	0	191,774
	Total economy	**27,607**	**0**	**189,563**	**115,785**	**0**	**0**	**0**	**0**	**0**	**2,315**	**0**	**335,270**
5 SECONDARY	Non-financial corporations	0	0	0	7,998	2,812	0	0	0	0	0	0	10,810
	Financial corporations	0	0	0	7,629	44,700	0	0	0	0	0	0	52,329
	Government	0	0	0	19,020	34,078	0	0	0	0	67	0	53,165

DISTRIBUTION OF INCOME	Households & NPISH	0	0	0	177,887	31,060	0	0	0	0	31	-89	208,978
	Total economy	**0**	**0**	**0**	**212,534**	**112,650**	**0**	**0**	**0**	**0**	**98**	**-89**	**325,282**
	Non-financial corporations	**0**	**0**	**0**	**0**	**5,152**	**0**	**0**	**0**	**0**	**0**	**0**	**5,152**
	Financial corporations	**0**	**0**	**0**	**0**	**24,021**	**0**	**0**	**0**	**0**	**0**	**0**	**24,021**
	Government	**0**	**0**	**0**	**0**	**41,653**	**0**	**0**	**0**	**0**	**0**	**0**	**41,653**
6	African: Percentile 1	0	0	0	0	1,176	20	0	0	0	0	0	1,196
	African: Percentile 2	0	0	0	0	1,054	8	0	0	0	0	-1	1,062
	African: Percentile 3	0	0	0	0	1,862	16	0	0	0	0	-2	1,878
	African: Percentile 4	0	0	0	0	2,170	21	0	0	0	0	-2	2,190
	African: Percentile 5	0	0	0	0	2,436	35	0	0	0	0	-3	2,471
	African: Percentile 6	0	0	0	0	3,079	51	0	0	0	0	-4	3,130
	African: Percentile 7	0	0	0	0	4,155	90	0	0	0	0	-5	4,245
	African: Percentile 8	0	0	0	0	5,540	168	0	0	0	0	-7	5,708
	African: Percentile 9	0	0	0	0	7,545	306	0	0	0	0	-9	7,850
	African: Percentile 10	0	0	0	0	10,541	616	0	0	0	0	-12	11,157
	African: Percentile 11	0	0	0	0	7,091	421	0	0	0	0	-7	7,513
	African: Percentile 12	0	0	0	0	5,085	4598	0	0	0	0	-4	9,683
	Total Africans	**0**	**0**	**0**	**0**	**51,734**	**6350**	**0**	**0**	**0**	**0**	**-58**	**58,084**
	Coloureds: Percentile 1	0	0	0	0	55	2	0	0	0	0	0	57
	Coloureds: Percentile 2	0	0	0	0	64	2	0	0	0	0	0	66
	Coloureds: Percentile 3	0	0	0	0	142	3	0	0	0	0	0	145
	Coloureds: Percentile 4	0	0	0	0	183	2	0	0	0	0	0	185
	Coloureds: Percentile 5	0	0	0	0	250	5	0	0	0	0	0	255
USE OF INCOME	Coloureds: Percentile 6	0	0	0	0	316	9	0	0	0	0	0	324
	Coloureds: Percentile 7	0	0	0	0	493	23	0	0	0	0	-1	516
	Coloureds: Percentile 8	0	0	0	0	789	32	0	0	0	0	-1	821
	Coloureds: Percentile 9	0	0	0	0	1,310	85	0	0	0	0	-1	1,395
	Coloureds: Percentile 10	0	0	0	0	2,246	114	0	0	0	0	-3	2,360
	Coloureds: Percentile 11	0	0	0	0	2,337	78	0	0	0	0	-3	2,415
	Coloureds: Percentile 12	0	0	0	0	2,249	1023	0	0	0	0	-3	3,272
	Total coloureds	**0**	**0**	**0**	**0**	**10,436**	**1377**	**0**	**0**	**0**	**0**	**-12**	**11,813**
	Indians: Percentile 1	0	0	0	0	2	0	0	0	0	0	0	2
	Indians: Percentile 2	0	0	0	0	3	0	0	0	0	0	0	3
	Indians: Percentile 3	0	0	0	0	10	0	0	0	0	0	0	11
	Indians: Percentile 4	0	0	0	0	14	0	0	0	0	0	0	14
	Indians: Percentile 5	0	0	0	0	36	0	0	0	0	0	0	36
	Indians: Percentile 6	0	0	0	0	68	0	0	0	0	0	0	69
	Indians: Percentile 7	0	0	0	0	120	2	0	0	0	0	0	121
	Indians: Percentile 8	0	0	0	0	326	6	0	0	0	0	0	332
	Indians: Percentile 9	0	0	0	0	584	17	0	0	0	0	-1	601
	Indians: Percentile 10	0	0	0	0	1,278	62	0	0	0	0	-1	1,340
	Indians: Percentile 11	0	0	0	0	1,524	94	0	0	0	0	-2	1,617
	Indians: Percentile 12	0	0	0	0	2,606	607	0	0	0	0	-2	3,213
	Total Indians	**0**	**0**	**0**	**0**	**6,571**	**788**	**0**	**0**	**0**	**0**	**-7**	**7,359**
	Whites: Percentile 1	0	0	0	0	6	0	0	0	0	0	0	6
	Whites: Percentile 2	0	0	0	0	12	0	0	0	0	0	0	12
	Whites: Percentile 3	0	0	0	0	31	0	0	0	0	0	0	32

	Whites: Percentile 4	0	0	0	0	51	0	0	0	0	0	0	51
	Whites: Percentile 5	0	0	0	0	80	0	0	0	0	0	0	81
	Whites: Percentile 6	0	0	0	0	188	1	0	0	0	0	0	189
	Whites: Percentile 7	0	0	0	0	365	3	0	0	0	0	0	368
	Whites: Percentile 8	0	0	0	0	773	11	0	0	0	0	-1	784
	Whites: Percentile 9	0	0	0	0	2,614	98	0	0	0	0	-2	2,713
	Whites: Percentile 10	0	0	0	0	6,617	426	0	0	0	0	-5	7,043
	Whites: Percentile 11	0	0	0	0	10,590	740	0	0	0	0	-10	11,329
	Whites: Percentile 12	0	0	0	0	50,236	6328	0	0	0	0	-45	56,563
	Total whites	**0**	**0**	**0**	**0**	**71,562**	**7608**	**0**	**0**	**0**	**0**	**-63**	**79,171**
	Total: Percentile 1	0	0	0	0	1,240	23	0	0	0	0	0	1,262
	Total: Percentile 2	0	0	0	0	1,132	10	0	0	0	0	-1	1,143
	Total: Percentile 3	0	0	0	0	2,046	19	0	0	0	0	-2	2,065
	Total: Percentile 4	0	0	0	0	2,417	23	0	0	0	0	-3	2,440
	Total: Percentile 5	0	0	0	0	2,803	40	0	0	0	0	-4	2,843
	Total: Percentile 6		0	0	0	3,651	61	0	0	0	0	-5	3,712
	Total: Percentile 7	0	0	0	0	5,133	118	0	0	0	0	-7	5,251
	Total: Percentile 8	0	0	0	0	7,427	218	0	0	0	0	-9	7,645
	Total: Percentile 9	0	0	0	0	12,054	505	0	0	0	0	-13	12,559
	Total: Percentile 10	0	0	0	0	20,681	1218	0	0	0	0	-21	21,899
	Total: Percentile 11	0	0	0	0	21,542	1333	0	0	0	0	-21	22,875
	Total: Percentile 12	0	0	0	0	60,176	12556	0	0	0	0	-54	72,732
	Total households & NPISH	**0**	**0**	**0**	**0**	**140,302**	**16124**	**0**	**0**	**0**	**0**	**-140**	**156,426**
	Total economy	**0**	**0**	**0**	**0**	**211,128**	**16124**	**0**	**0**	**0**	**0**	**-140**	**227,253**
7 CAPITAL	**Total capital**	**0**	**0**	**0**	**0**	**0**	**12382**	**0**	**0**	**80,006**	**-200**	**0**	**92,188**
8 TOTAL FCF	**Total fixed capital formation**	**0**	**33,547**	**0**	**0**	**0**	**0**	**3,838**	**0**	**0**	**0**	**0**	**37,385**
9 FINANCIAL	Monetary authority	0	0	0	0	0	0	2,096	0	0	-441	0	1,654
	Other monetary institutions	0	0	0	0	0	0	24,543	0	0	-5,636	0	18,907
	Public investment commissioners	0	0	0	0	0	0	6,590	0	0	-558	0	6,032
	Insurers and retirement funds	0	0	0	0	0	0	14,592	0	0	-2,463	0	12,130
	Other financial institutions	0	0	0	0	0	0	6,358	0	0	-1,920	0	4,438
	Total financial intermediaries	**0**	**0**	**0**	**0**	**0**	**0**	**54,179**	**0**	**0**	**-11,018**	**0**	**43,161**
	Central government	0	0	0	0	0	0	693	0	0	5,591	0	6,284
	Local authorities	0	0	0	0	0	0	-357	0	0	2,266	0	1,910
	Total general government	**0**	**0**	**0**	**0**	**0**	**0**	**336**	**0**	**0**	**7,857**	**0**	**8,194**
	Public sector	0	0	0	0	0	0	-1,430	0	0	-1,648	0	-3,079
	Private sector	0	0	0	0	0	0	16,179	0	0	1,480	0	17,659
	Corporative business enterprises	**0**	**0**	**0**	**0**	**0**	**0**	**14,749**	**0**	**0**	**-168**	**0**	**14,581**
	Households	**0**	**0**	**0**	**0**	**0**	**0**	**17,325**	**0**	**0**	**-3,254**	**0**	**14,071**
	Total economy	**0**	**0**	**0**	**0**	**0**	**0**	**86,589**	**0**	**0**	**-6,583**	**0**	**80,006**
10 & 11 REST OF THE WORLD	Total Current	62,318	0	727	6950	1,503	0	0	0	0	0	0	71,498
	Total Capital	0	0	0	0	0	0	100	0	0	-6,882	0	-6,782
	Total rest of the world	**62,318**	**0**	**727**	**6,950**	**1,503**	**0**	**100**	**0**	**0**	**-6,882**	**0**	**64,716**
	TOTAL INPUT	**649,042**	**559,118**	**190,290**	**335,269**	**325,282**	**227,253**	**92,190**	**37,385**	**80,006**	**64,714**	**-229**	**2,560,549**

5 Policy analysis with the SAM

5.1 World Wide policy framework

The Province of KwaZulu-Natal has adopted the Millennium Development Goals (MDGs), the Accelerated Share Growth Initiative South Africa (ASGI-SA), and the Provincial Spatial Economic Development Strategy (PSEDS) policies (Figure 17). These policies address the world-wide challenges of inequality, poverty and unemployment. Development strategies and interventions on the part of international bodies or of national and provincial governments should be viewed in the context of, and measured against the following millennium development goals which apply to all countries and regions. Underdevelopment and deprivation are legacies that affect all provinces in this country. KwaZulu-Natal is no exception, and the consequences of poverty, deprivation and inequality which afflict most communities in the province need to be met by an aggressive, integrated and targeted drive to promote growth and development.

This section of the paper shows how an economic model based on SAM can be used as a tool for policy analysis. We offer here two illustrative possibilities of what can be derived from the model. The first example is a situation where policy makers have a specific target that they need to achieve and want to know what input is required to achieve that specific target. One example is the ASGI-SA's target of 6% economic growth by 2010. The second example is a situation where policy makers desire to invest a certain amount in a particular project and want to know the impact that such an initiative is likely to have on households and on the economy as a whole: a case of choosing an intervention that will yield optimal benefits.

The provincial government has developed a two-stage Growth and Development Strategy which is closely aligned to both the MDGs and national development goals. The PGDS (Provincial Growth and Development Strategy) provides a framework for public and private sector investment, indicating broad development opportunities and priorities. It addresses key issues of implementation blockages whilst providing strategic direction, all within the framework of a developmental approach to government. The PSEDS (Provincial Spatially-based Economic Development Strategy) is a spatial representation of the PGDS[15].

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[15] The PGDS does not provide a detailed spatial perspective on where development should take place around the province. For this reason it has become necessary for the provincial government to develop a spatially-based economic development strategy to give a spatial context to the provincial priorities and development programmes identified in the PGDS. It must be emphasised that this spatially-based economic development strategy will not be developed independently of the PGDS: on the contrary, it can be regarded as the spatial representation of the PGDS.

Figure 17: World-wide policy framework

MDGs

- Eradication of extreme poverty and hunger
- Achievement of universal primary education
- Promotion of gender equality and empowerment of women
- Reduction in child mortality
- Improvement of maternal health
- Combating HIV/AIDS, malaria and other diseases
- Ensuring environmental sustainability
- Developing a global partnership for development

ASGI-SA

The overall goal of ASGI-SA is to increase shared growth to 6%+ and to halve poverty and unemployment by 2014.

There are three principles, or broad national goals:

- accelerate growth in the economy
- reduce the gap between the first and second economies
- ensure that social security reaches all who are legible

PSEDS

The KwaZulu-Natal Provincial Spatial Economic Development Strategy is a comprehensive, aggressive, integrated and targeted approach that aims at addressing underdevelopment,

The main indicators and targets (2014 goals) contained in the KwaZulu-Natal Provincial Spatial Economic Development Strategy are as follows:

Indicator	2004	2014	2014 target
People in poverty	5.32m	6.17m	3.08m
Unemployment	0.99m	0.93m	0.46m
Economic growth	4.9%	-	7.5%
Illiteracy (2001)	1.10m	1.62m	0.81m
HIV prevalence	1.36m	1.71m	0.86m

In line with the MDG, PSEDS expects poverty figures to rise to a population total of 6.17 million in 2014, and the target is to halve that to 3.08 million in 2014. Similarly, an unemployment figure below half a million people is the target for 2014. Budget[16] allocation is pivotal in seeking to accelerate the PSEDS, and the provincial government has identified several key intervention strategies, projects and programmes as priorities for the 2007/08 MTEF period. It has singled out three developmental strategies: economic growth, employment creation, and improvement in service delivery. Figure 18 outlines the overall strategic structure.

[16] The provincial government Policy Priorities driving the 2007/08 Budget are informed by three broad developmental strategies:
● Stimulating sustainable and shared economic growth through partnerships
● Employment creation and empowerment initiatives
● Improving service delivery.

Figure 18: Key intervention strategy (Provincial Treasury MTEF 2007/08)

The three developmental strategies

A. Stimulating sustainable and shared economic growth through partnerships

B. Employment creation and empowerment initiative

C. Improving service delivery

- promote investment in the local economy
- enhance infrastructural investment
- encourage investment by parastatals
- facilitate the Dube Trade Port and International Airport project
- provide financial support towards construction for the 2010 FIFA World Cup
- attract Foreign Direct Investment into the province
- pursue Foreign Trade Missions
- provide finance for economic growth projects through the Provincial Growth Fund
- support the A1 Grand Prix and Zulu

- promote the provincial government's Black Economic Empowerment (BEE)
- sustain Agrarian Revolution and basic food security programmes
- support small, micro and medium enterprises (SMMEs)
- encourage co-operative programmes
- facilitate specific job creation programmes (EPWP)
- encourage business process outsourcing
- empower people through savings

A
- adequately fund education sector
- provide suitable health facilities
- strengthen social welfare
- promote good governance

B
- intensify the fight against crime and corruption

Source: KwaZulu-Natal Treasury (2007)

Figure 19: Real GDP-R (Growth Rate: 1998–2010)
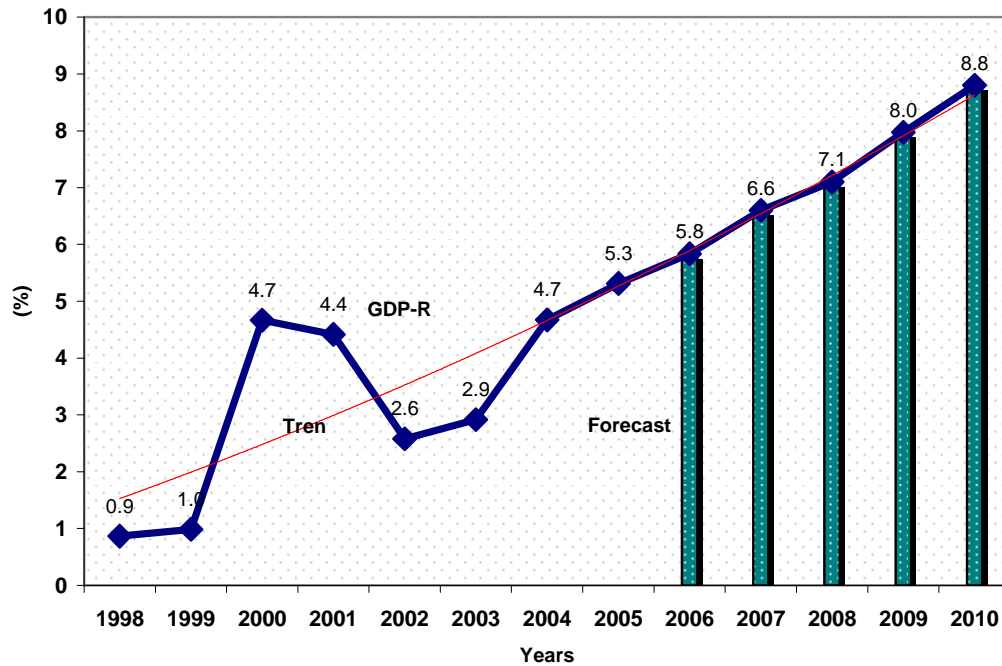
Source: Stats SA, Provincial Treasury (2007)

5.2 Provincial policy analysis and the role of KZN SAM

The ASGI-SA policy target of 6% real GDP growth rate in 2014 is not an idle dream for the province of KwaZulu-Natal. This can be attested by a sample trend based on historical performance and forecasted real GDP-R growth, as shown in Figure 19. A realistic challenge that would stretch policy makers is to reach a sustainable 8.8% in 2010[17]. Pertinent strategic questions here are: (1) What level of input and/or output do economic sectors need in order to reach the new target? (2) What level of skills does the province require to achieve and sustain that growth? (3) It being provincial policy to promote pro-poor growth and not jobless growth, to what extent will the new economic growth reach the targeted beneficiaries? The SAM model provides answers to these questions.

A SAM model uses Leontief Multipliers to calibrate and generate the input required to achieve a specific target, in this case 8.8% GDP-R growth rate in 2010. Results presented in section 5.3 show how much all sectors need to grow to attain the production level (Sector gap analysis) that corresponds to the desired target. It also reveals the level of employment (labour gap analysis in 2010) in terms of sector employment and occupation.

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[17] This model and the results presented in the next section do not include the impact of the 2010 FIFA World Cup on the regional economy. Researchers are encouraged to conduct such an impact study using the SAM multipliers.

Table 21: Total input required between 2006-2010 by sector

(Rand million)	Input Required 2006-2010	Input requirement (%)
Primary Industry	**19,787**	**0.35**
Agriculture	12,313	−0.72
Forestry	1,788	0.18
Fishing	408	0.10
Coal mining	1,437	0.09
Gold mining	554	0.14
Other mining and quarrying	3,287	0.55
Secondary Industry	**114,548**	**28.84**
Food, beverages and tobacco	15,675	3.95
Textiles, clothing and leather goods	9,165	2.31
Wood and paper; publishing and printing	11,472	2.89
Petroleum products, chemicals, rubber and plastic	19,526	4.92
Other non-metal mineral products	2,056	0.52
Metals, metal products, machinery and equipment	15,785	3.97
Electrical machinery and apparatus	2,521	0.63
Radio, TV, instruments, watches and clocks	1,093	0.28
Transport equipment	7,811	1.97
Furniture and other manufacturing	8,735	2.20
Electricity	7,725	1.94
Water	2,165	0.55
Construction	10,820	2.72
Tertiary Industry	**262,859**	**70.82**
Wholesale & retail trade	57,228	14.41
Catering and accommodation	8,340	4.83
Transport	40,206	10.12
Communication	15,715	3.96
Finance and insurance	27,920	7.03
Business services	41,369	11.23
Community, social and other personal services	23,755	5.98
General government services	48,326	13.26
Provincial GDPR	**397,194**	**100.00**

Source: KwaZulu-Natal Provincial Treasury (2007)

5.3. Analysis of selected results

Selected results of the model are presented next, in order to illustrate how a SAM and its associated Leontief multipliers are used for policy analysis. The first result is based on input requirement, and on employment requirement by sector and by skill level. The second result shows how an economic shock affects households.

5.3.1 Simulating input requirement by sector

Based on the GDPR forecast in Figure 19, the economy of KwaZulu-Natal is expected to grow from 5.3% in 2005 to 9.8% in 2010, meaning that the required additional growth (referred to in this context as the *growth gap*) is 3.5%. Table 21 shows that to close that growth gap of 3.5% requires an additional total input of Rm 397,194 between 2006 and 2010. Tertiary industry is expected to contribute 70% of the required input. Tertiary industry requires highly skilled labour, unlike primary industry. As the provincial economy becomes increasingly service and industry driven, skill adjustments to match the demand become very critical.

Table 21 is presented in an aggregated format in Figure 20. The figure shows that between 2006 and 2010 more than 60% of the demand for input will emanate from three sectors: Manufacturing, Trade, and Finance.

Figure 20: Input requirements per sector (%) 2006-2010
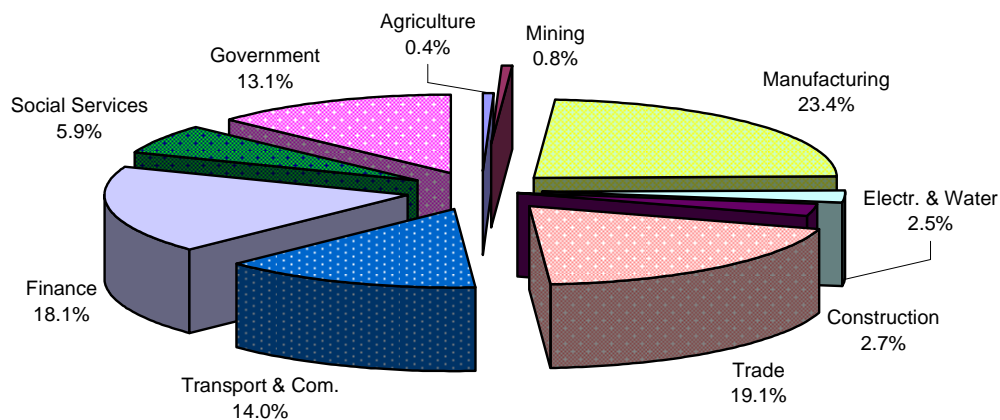
Source: KwaZulu-Natal Provincial Treasury (2007)

Given the total demand for input, the analysis in Table 22 shows that the real GDP-R estimates for 2010 are expected to increase from Rm 183,382

in 2005 to Rm 260,310 in 2010. Tertiary industry remains the main contributor followed by secondary industry.

The expected growth rate will yield optimal job creation if appropriate measures are taken to address skill needs and improve productivity in primary industry.

Table 22: Real GDP-R (projected for) 2010

|	% Contribution	Real GDP-R (2010)
Primary Industry	**3.0**	**7,809**
Agriculture	2.2	5,727
Mining	0.8	2,082
Secondary Industry	**28.1**	**73,147**
Manufacturing	23.0	59,871
Electricity & Water	2.4	6,247
Construction	2.7	7,028
Tertiary Industry	**58.4**	**152,021**
Trade	13.6	35,402
Transport	11.2	29,155
Finance	16.1	41,910
Community services	5.0	13,015
Government	12.5	32,539
Taxes less subsidies on products	**10.5**	**27,333**
Real GDP-R	**100.0**	**260,310**

Source: KwaZulu-Natal Treasury (2007)

5.3.2 Simulating employment by skill, by occupation, and by sector

Figures 22 and 23, and Tables 23 and 24 provide the level of employment by sector and by skill level that is required to reach the 8.8% economic in 2010. In other words, if we ask what employment level is required to close the 3.5% growth gap discussed in Figure 19 then Table 23 shows us that an additional 271,000 jobs will be required, to take employment figures from 2.2 million in 2006 to 2.5 million in 2010.

What skill level is the required employment force expected to possess? Figure 21 shows a need for an increase in skill levels 1, 2, and 4 and a decrease in the need for skill level 2 (secondary school education). Table 23 provides a breakdown of employment by skill and by occupation. It shows for skill level 3 (technicians) that there were 213,000 workers at that level in 2006, expected to increase to 246,000 in 2010, which represents a requirement at skill level 3 of 33,000 additional technicians.

Figure 21: Employment 2006–2010 (Skill level requirement)
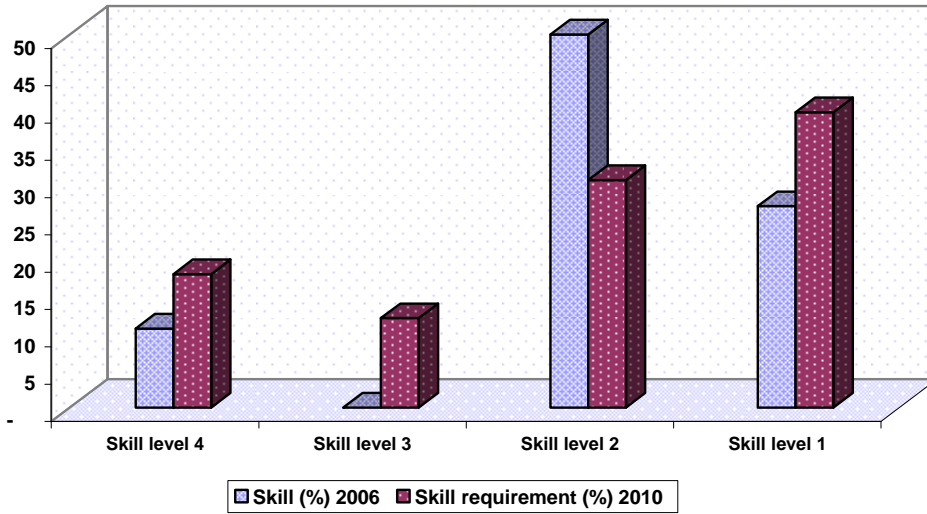

Source: KwaZulu-Natal Provincial Treasury (2007)

Table 23: Employment requirements by skill/occupation 2006–2010

	Employment number (000) 2006	Employment (%) 2006	Employment number (000) 2010	Employment requirement number (000) 2010	Employment requirement (%)
Skill level 4	**237**	**10.6**	**286**	**49**	**17.9**
Legislators, Senior officials and managers	145	6.5	153	8	2.9
Professionals	92	4.1	133	41	15.0
Skill level 3	**213**	**9.5**	**246**	**33**	**12.0**
Techinicians and associates professionals	213	9.5	246	33	12.0
Skill level 2	**1,185**	**52.9**	**1,268**	**83**	**30.5**
Clerks	191	8.5	238	47	17.5
Service Workers and market sale workers	275	12.3	313	39	14.2
Skilled agric. & Fishery workers	196	8.7	145	(50)	(18.5)
Craft & related trade workers	310	13.8	343	34	12.4
Plant & machinery operators	215	9.6	228	13	4.9
Skill level 1	**604**	**27.0**	**712**	**107**	**39.6**
Elementary occupation	426	19.0	541	115	42.4
Domestic Workers	178	7.9	170	(8)	(2.8)
Total Employment	**2,240**	**100.0**	**2,511**	**271**	**100.0**

Source: KwaZulu-Natal Provincial Treasury (2007)

Table 23 also indicates considerable demand for a higher proportion of professionals in 2010 (15%) compared to 2006 (4.1%). Figure 22 shows that the additional employment for professionals will chiefly benefit Whites (45.5%) followed by Africans (35.9%). The question is: will the province have 14,700 African professionals in 2010, and if not where will they come from? The skill surplus or shortage in the province needs to be taken into account by the Department of Education and the Department of Labour when drafting their strategic plans.

**Figure 22: Professionals requirement by race**
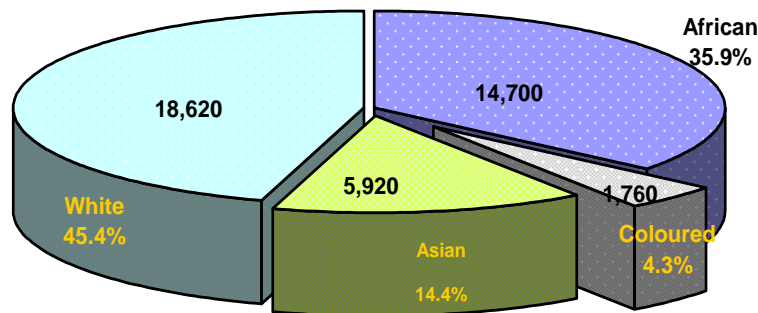
Source: KwaZulu-Natal Provincial Treasury (2007)

Having considered employment requirement by profession and by race, the analysis goes one step further in Figure 23 and Table 24 in which employment requirement is indicated by sector.

Figure 23 shows that between 2006 and 2010 primary industry is expected to experience a decline in demand for employment while secondary and tertiary industries are expecting their employment requirements to rise. Disaggregating these industries into sectors, Table 24 shows that in 2006 Trade employed 358,000 people. The figure is expected to increase to 413,000 in 2010, indicating that an additional 55,000 will need to be taken on between 2006 and 2010.

Figure 23: Employment 2006–2010 (Industry requirement)
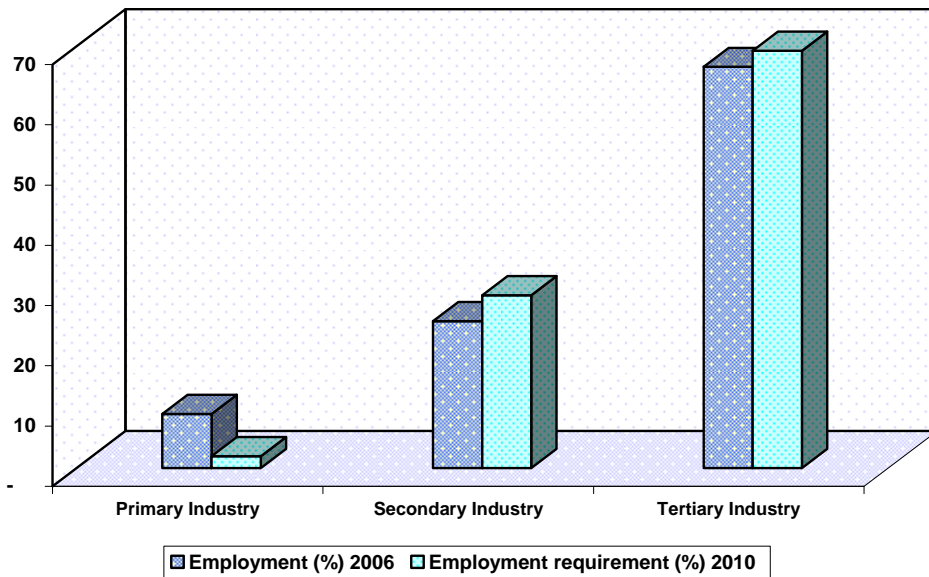
Source: KwaZulu-Natal Provincial Treasury (2007)

Table 24: Employment requirement by economic sector 2006–2010

	Employment number (000) 2006	Employment (%) 2006	Employment number (000) 2010	Employment requirement number (000) 2010	Employment requirement (%)
Primary Industry	**202**	**9.0**	**207**	**5.4**	**2.0**
Agriculture	179	**8.0**	184	4.8	1.8
Mining	22	**1.0**	23	0.6	0.2
Secondary Industry	**546**	**24.4**	**624**	**77.9**	**28.7**
Manufacturing	448	**20.0**	514	66.1	24.4
Electricity & Water	9	**0.4**	10	1.1	0.4
Construction	90	**4.0**	100	10.7	4.0
Tertiary Industry	**1,492**	**66.6**	**1,679**	**187.7**	**69.3**
Trade	358	**16.0**	413	54.7	20.2
Transport	67	**3.0**	75	8.0	3.0
Finance	291	**13.0**	326	34.8	12.8
Community services	372	**16.6**	413	41.2	15.2
Government	403	**18.0**	452	49.0	18.1
Total Employment	**2,240**	**100.0**	**2,511**	**271**	**100.00**

Source: KwaZulu-Natal Provincial Treasury (2007)

The projected future performance of the province indicates the need not only for an industrial policy but even more for policy that address the challenges of the service sector. Although the model predicts a boom in the service sector, employment level does not follow the trend as it should. Employment contribution will drop in primary industry, and it will rise in secondary and tertiary industry (Figure 22). Table 24 shows for the tertiary (or service) sector, for example, that the highest employment requirement is expected in the trade category (rising from 16% in 2006 to 20% in 2010).

5.3.3 Simulating household income and household consumption expenditure

Figure 24 indicates what the impact would be of a 10% change in household consumption expenditure.

Assuming a change in household income by 10% (through income grants, wages and salaries, etc), demand will be stimulated and output boosted by varying degrees in certain industries and their products, as shown in Table 25.

Figure 24 and Table 25 show that as a result of a 10% change in household expenditure, the industry output for *Trade, Hotels and Restaurants* will increase the most (by 7.9%, worth R4.7 billion), with an even greater increase (8.2%, worth R5.1 billion) in the products output for *Trade, Hotels and Restaurants*. Increase in household consumption expenditure has a least impact on construction industry and construction products.

Figure 24: Impact of 10% change in household consumption
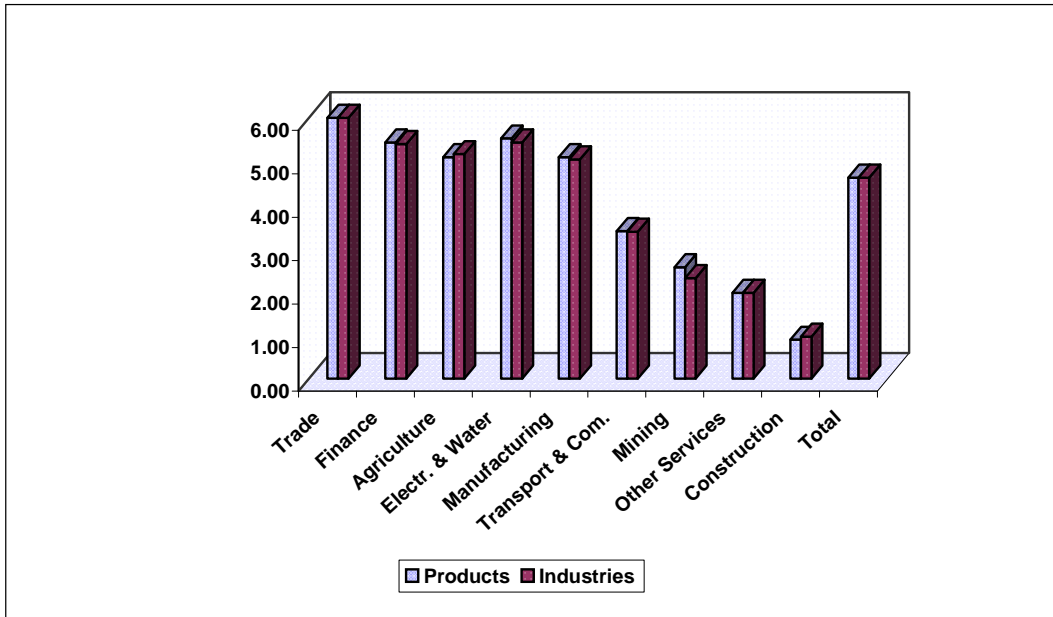
expenditure 2005

Source: KwaZulu-Natal Provincial Treasury (2007)

Table 25: Simulating household income and expenditure 2005

Assume 10% change in household consumption expenditure				% change in total output
	Household	10% change	Change in total output	
INDUSTRIES				
Agriculture, Forestry, Fishing	0	0	1,113	5.16
Mining and Quarrying	0	0	210	3.31
Manufacturing	0	0	11,142	5.04
Electricity, Gas and Water	0	0	647	5.44
Construction	0	0	196	0.97
Trade, Hotels and Restaurant	0	0	4,748	7.96
Transport and Communication	0	0	2,327	3.37
Finance, Business services	0	0	3,970	5.39
Other services	0	0	1,497	1.97
TOTAL			25,849	4.62
PRODUCTS				
Agriculture, Forestry, Fishing	1,875	188	1,293	5.09
Mining and Quarrying	-	-	504	3.56
Manufacturing	56,614	5,661	13,771	5.09
Electricity, Gas and Water	1,423	142	687	5.52
Construction	-	-	225	0.89
Trade, Hotels and Restaurant	46,487	4,649	5,094	8.17
Transport and Communication	10,312	1,031	2,404	3.39
Finance, Business services	16,402	1,640	4,282	5.43
Other services	11,492	1,149	1,774	1.97
TOTAL	144,606	14461	30,035	4.62

Source: KwaZulu-Natal Provincial Treasury (2007)

5.3.4 Simulating impact of total provincial income distribution on households

One of the questions that motivated the development of a SAM model was to test whether the provincial income reaches the targeted social group (such as Africans households in the lower income class). Table 26 indicates that half of the province's income ends up in the hands of Whites, while the share received by Africans is 37.1%.

The gap between the lower class and the upper class is wide. Households in the upper class enjoy three quarter of the province income while households in the lower class receive 4.4%. Individually, households in the lowest income group 1 receive 81 cents, compared to R46.5 for households in the upper income group 12. This is an indication that wealth is still in the hands of the few rich households, not yet reaching the majority (largely African) in the lower income groups.

Table 26: Generation & distribution of Provincial Income 2005

Income Group	African	Coloured	Indian	White	Total	Household categories
Income Gr. 1	0.76	0.04	0.00	0.00	**0.81**	
Income Gr. 2	0.68	0.04	0.00	0.01	**0.73**	**4.42**
Income Gr. 3	1.20	0.09	0.01	0.02	**1.32**	Lower class
Income Gr. 4	1.40	0.12	0.01	0.03	**1.56**	
Income Gr. 5	1.58	0.16	0.02	0.05	**1.82**	
Income Gr. 6	2.00	0.21	0.04	0.12	**2.37**	**20.46**
Income Gr. 7	2.71	0.33	0.08	0.24	**3.36**	Middle class
Income Gr. 8	3.65	0.52	0.21	0.50	**4.89**	
Income Gr. 9	5.02	0.89	0.38	1.73	**8.03**	
Income Gr. 10	7.13	1.51	0.86	4.50	**14.00**	
Income Gr. 11	4.80	1.54	1.03	7.24	**14.62**	**75.12**
Income Gr. 12	6.19	2.09	2.05	36.16	**46.50**	Upper class
Total	**37.13**	**7.55**	**4.70**	**50.61**	**100.00**	**100.00**

Source: KwaZulu-Natal Provincial Treasury (2007)

6 Conclusion

This publication presents the methodology used in developing a Regional Social Accounting Matrix for policy analysis. The RSAM focuses on poverty, labour, fiscal and growth policies. The RSAM model developed in this study tests whether the income generated in the province reached the targeted social group. What the model shows is that more than half of the regional income ends up in the hand of Whites, while the share of Africans is about 37%. Households in the low income group receive less than 5% of the total income yet they constitute almost three-quarters of the population, while households in the higher income group, who are the minority, receive more than three-quarters of total income generated in the province, signalling that the gap between the first and the second economies is still wide.

The trend and performance of the KwaZulu-Natal economy reveals that between 1995 (base year) and 2006 the real GDP-R grew by 47% and the regional budget grew impressively by 241% in real terms. Are such growths pro-poor, pro-jobless, and sustainable? The trend analysis shows that during the same period unemployment grew by 78% and poverty by 33%, meaning that growth in GDP-R and growth in provincial government expenditure did not fully translate into tangible job creation and improvement of the quality of life.

In the RSAM model, household simulations were performed to check the impact of a 10% increase in household income on the overall economy of the province. Simulation results using the Leontief multipliers shows that an additional 10% increase in household income will lead to an 8% increase in the output of the Trade industry sector, and 5% increase in the output of the Agriculture industry sector. This is in line with the economic theory that says that poor households spend most of their income on food.

Looking at growth sustainability, the study forecasts the level of future growth and then calculates the level of input required (in terms of economic sector, labour and skill) to achieve targeted output. The finding is that there is a diminishing marginal return and an insignificant sector and labour input requirement in the primary sector, in contrast with a high sector input and highly skilled labour requirement in the tertiary sector. For example, the RSAM model predicts a need for 41,000 professionals by 2010, 40% of whom need to be Africans. The level of growth and employment expected by 2010 is subject to the ability of the government to meet, among other things, the high demand of highly skilled labour.

The Leontief multipliers derived from the RSAM model show that for every R1 spent in any of the nine sectors of the KZN economy, the impact is greatest in the manufacturing industry, and causes this industry's demand to rise. Could this be one of the reasons why this industry consistently maintained its industrialisation sustainability? Manufacturing is also the main contributor to GDP-R.

The Kwazulu-Natal SAM model is available for policy analysis in the province and will be useful for impact analysis. The model contains external matrixes (rural-urban, formal-informal, male-female, and age group) that can be used for a variety of simulations to determine the impact of private and government interventions on variables in these external matrixes.

This KZN SAM will be updated as soon as pertinent new statistics become available; the updated KZN SAM will be used as a basis in developing the Computable General Equilibrium (CGE) Model for the province of KwaZulu-Natal.

Readers of this publication who would like to comment are welcome to communicate with the author.