

A 2012 SAM for South Africa

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Mini SAMs 1993-2013

(<https://www.wider.unu.edu/database/2012-social-accounting-matrix-south-Africa>)

# **A 2012 Social Accounting Matrix (SAM) for South Africa** by Dirk van Seventer<sup>1</sup>, Faaiga Hartley<sup>2</sup>, Sherwin Gabriel<sup>2</sup> & Rob Davies<sup>1</sup>, <sup>1</sup>UNU WIDER, <sup>2</sup>SA National Treasury

## **Background & objective 2012 Social Accounting Matrix (SAM)**

- The SA National Treasury (NT) uses SAM data for economy-wide modelling
- SAMs present economy-wide snapshot
  - For a single point in time (year)
  - Think of it as National Accounts in a matrix
  - .. but with some detail (act / comm / factor / hh)
  - Features interactions amongst economic entities → multipliers
  - Can be used for various forms of modelling (descriptive / linear / non-linear)
- Underlying data is updated on regular basis
  - (SUTs / Nat Acc / HH Surveys / Lab Force Surveys)
- Aim of project: develop template for NT in-house updating

# Results: SAM with following features

- Full consistency with Nat Acc preserved
  - zero tolerance in rebalancing
- Method can be repeated for other SUT years (now 2007 – 2014)
  - As long as the disaggregation remains the same
  - New survey data from QLFS and LCS will require manual operation
    - Rerun same coding
- Dimensions
  - 62 activities / 104 commodities (consistent with SSA SUT)
  - 4 types of labour (by education attainment)
  - 14 types of households (9 income decile & 2% intervals at the top decile)

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# Compilation of annual mini SAMs for South Africa 1993-2013 in current and constant prices by Dirk van Seventer<sup>1</sup>

## Background and objective:

- SA Nat Treasury uses CGE models for policy analysis purposes
- CGEs use parameters for behavioural equations
  - Production functions etc
  - Usually taken from literature or estimated with standard econometrics
- SAM time series:
  - alternative estimation of parameters through calibration
  - analyse structural change with decomposition methods
- SAMs need to be in constant prices
- Why mini?: manageable with some detail
  - 15 activities & commodities / 1 labour / 1 hh

## Activity/Commodity Breakdown

Non-manufacturing is 1 digit

## Manufacturing Breakdown

Manufacturing of food products, beverages, and tobacco products

Manufacturing of textiles, clothing, leather, footwear, wood, paper & printing

Manufacturing coke, refined petroleum products, chemicals, rubber, plastic

Manufacturing non-met min, basic & fabricated metals, machinery & equipment

Manufacturing of electrical machinery and apparatus n.e.c.

Manufacturing of transport equipment

## Two Step Process

1. Construct SAM series in current prices
2. Deflation → constant price SAMs

# Methodology Step 1: Current Price Series

- Distinguish 2 periods
  - **2013-2006**: SSA annual SUTs for 2007-2013 and Annual National Accounts
    - Balancing first → aggregation
  - **2005-1993**: 7 SSA SAMs for selected years / Annual Nat Acc
    - Missing years: closest SAM
- Activity value added (GVA) and breakdown benchmarked on SSA series
  - 1 & 2 digit
- Problem: total import duties from SARB Govt Stats
  - Commodity level rates initially 2007
- Complication: informal sector treatment in SUTs different from to SSA GVA
  - Comparison between SUT and SSA 2 Digit GVA
    - Aggregate SUT → 2 Digit

Table 3: Comparing the Stats SA Q32014 release and the Stats SA UT GVA at basic Rmillion prices (2013)

2D_Descr	SSA2D@BP 3,172,961 2013	UseTbl@BP 3,172,961 2013	%diff	abs diff
Agriculture 1/	62,826	62,678	0.20%	148
Forestry	7,319	7,319		
Fishing	3,313	3,313		
Coal	63,998	63,998		
Gold	52,676	52,676		
Platinum group metals	129,350	129,350		
Other mining and quarrying 1/	38,778	38,339	1.10%	439
Food, beverages and tobacco	101,094	101,094		
Textiles, clothing and leather goods	13,257	13,257		
Wood and paper; publishing and printing	50,148	50,148		
Petroleum products, chemicals, rubber and plastic	93,695	93,695		
Other non-metal mineral products	16,477	16,477		
Metals, metal products, machinery and equipment	74,557	74,557		
Electrical machinery and apparatus	6,648	6,648		
Radio, TV, instruments, watches and clocks	6,163	6,163		
Transport equipment	27,230	27,230		
Furniture; other manufacturing 1/	30,662	20,240	51.50%	10,421
Electricity and gas	92,398	92,398		
Water	25,068	25,068		
Construction 1/	126,435	105,124	20.30%	21,311
Wholesale trade	155,599	155,599		
Retail trade; repair of household goods 1/	214,459	122,125	75.60%	92,334
Motor trade; repair of motor vehicles	72,517	72,517		
Catering and accommodation	28,433	28,433		
Transport 1/	252,187	224,188	12.50%	27,999
Communication	65,787	65,787		
Finance and insurance	298,890	298,890		
Real estate	184,224	184,224		
Business services 1/	160,052	131,787	21.40%	28,265
General government services	532,122	532,122		
Personal services 1/	186,599	367,517	-49.20%	-180,918
1/ Includes estimates of the informal sector				

Use SSA GVA as benchmark since it covers whole period → informal treated as formal



# Methodology Step 2: Constant Price Series

- Deflators considered but unsuitable
  - Domestic output of SA industry / Commodities for SA consumption
  - Exports / Imports
  - Implicit mining and manufacturing
  - Due to lack of coverage (series not long enough) and / or change in coverage
  - Some require physical quantities for weighted aggregation but hard to find data
- Deflators used:
  - SSA GVA & Total Intermediate Use
  - SARB implicit for Final Demand / Assets / Imports / Exports (limited detail)
- Final Balance
  - Total Intermediate Input = Total Intermediate Sales (use Final Demand deflators)
    - Total Intermediate Sales weakest link → scale
    - Residual to  $\Delta$ stocks
  - Biproportional scaling of intermediates with current price structure as starting point
  - Transfers
    - current price ratios
    - residual derivations

Table 2: Deflator Schedule for Constant Price SA Mini SAMs 1993-2013

	Activities	Commodities	Domestic Final Demand	Investment	Inventory Changes & Residual	Exports	Total
Activities		4) Derived from 3)					3) Total Derived
Commodities	1) Stats SA Intermediate Consumption & SARB Final Demand Commodities followed by scaling		7) SARB Final Demand Commodities	8) SARB Asset Commodities	10) Residual	9) SARB Exports	6) Total Derived
Value Added	2) Stats SA/SARB GVA						
Imports		5) SARB Imports					
Total	3) Total Derived	6) Total Derived					

Source: author's workings

# Further work

- **Applications: elsewhere**
- **Disaggregation**
  - Labour (only same deflator but different weights)
  - Households (only same deflator but different weights)
  - More industries but requires more detailed deflators
    - Selected years
    - Shorter period → more deflators available
  - However, structural break for deflators in 2010 remains obstacle
  - Furthermore, SUTs undergone revision in structure
    - 2014-2010: revised structure
    - 2009-2007 (and prior??): old structure
    - Recommended: compare old and revised structure for overlapping years