Structural Change in South Africa, 1993-2013

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with

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Introduction

- Annual series of consistent SAMs from 1993-2013
  - Built primarily for calibrating CGE model
  - But provides a useful data set for thinking about how the economy has changed over that period
- SAMs constructed using existing data
  - So no new information
  - But bringing together different data in a consistent economy-wide framework can give new insights

Preliminary: what is 'structure'?

- Connotations of fundamental, slow changing, not contingent

- We focus on industrial structure
  - 'Industrial structure' = sectoral composition of GDP
  - But this is an outcome of contingent shocks and more 'structural' features: technology, linkages, etc

- Have these features changed?

Methods

- Use supply and use table part of SAM to construct multipliers
- Explore how they have changed
- Use decomposition methods to identify changes due to
  - changes in technical 'inter-industry' relations
  - changes due to other factors - demand
- Analysis is descriptive NOT causal
- Compare average SAMs 1993-95 and 2011-13
  - Constant 2010 prices
- Many results – try to tell a story

Some economy-wide ratios (%)

|		1993-95	2011-13
1	Value Added/Gross Value of Production	53.9	45.5
2	Compensation of Employees/Value Added	56.5	51.5
3	Gross Operating Surplus/Value Added	43.5	48.5
4	Imports/Total Supply	10.2	13.2
5	Domestic supply/Total Supply	89.8	86.8
6	Intermediate Sales/Demand	40.2	45.2
7	Private Consumption/Demand	27.9	25.6
8	Government Consumption/Demand	10.6	8.5
9	Gross Domestic Fixed Investment/Demand	6.8	8.6
10	Exports/Demand	14.5	12.1

Implications of changes in VA/X and W/VA

- Fall in VA/X → must sell more to get same (real) VA
- Fall in W/VA → must get more VA to get same wage
- Economy-wide VA/X fell 53.9% to 45.5%
  - to generate R1 of VA needed sales of
    - R1.85 in 1993
    - R2.20 in 2013
- W/VA fell 56.5% to 51.5%
  - to generate R1 of wages needed VA of
    - R1.77 in 1993
    - R1.94 in 2013
- Combined, to generate R1 of wages, needed sales of
  - R3.28 in 1993 and R4.27 in 2013
  - 30.2% more
- Where are those sales?
- But varies across sectors

Sector implications of changes in VA/X and W/VA

	Output to create R1 of Value Added		Value Added to create R1 of Wages		Output to create R1 of Wages		
	1993-95	2011-13	1993-95	2011-13	1993-95	2011-13	%chg
01_aagr	1.83	2.60	3.57	3.27	6.53	8.52	30.4%
02_amin	1.62	1.70	1.91	2.51	3.10	4.27	37.9%
03_afbt	3.05	3.30	2.18	1.66	6.64	5.48	-17.5%
04_almf	3.38	3.79	1.85	1.50	6.26	5.69	-9.1%
05_achm	3.25	3.65	2.25	2.07	7.29	7.56	3.7%
06_amme	3.22	4.61	1.69	1.53	5.44	7.03	29.3%
07_aemc	3.47	4.15	1.61	1.32	5.57	5.50	-1.4%
08_atre	5.21	5.40	1.69	1.33	8.78	7.17	-18.4%
09_aelg	1.82	1.98	3.54	3.51	6.42	6.97	8.4%
10_acns	3.39	3.44	1.54	2.16	5.21	7.43	42.6%
11_atra	1.67	1.78	2.01	2.45	3.36	4.36	29.9%
12_atrp	1.73	2.13	2.11	3.23	3.64	6.87	89.0%
13_afib	1.50	1.96	2.70	2.43	4.05	4.74	17.1%
14_agvt	1.29	1.50	1.12	1.14	1.44	1.71	18.4%
15_aosv	1.48	1.99	1.42	1.63	2.10	3.25	54.4%

Backward and Forward Multipliers
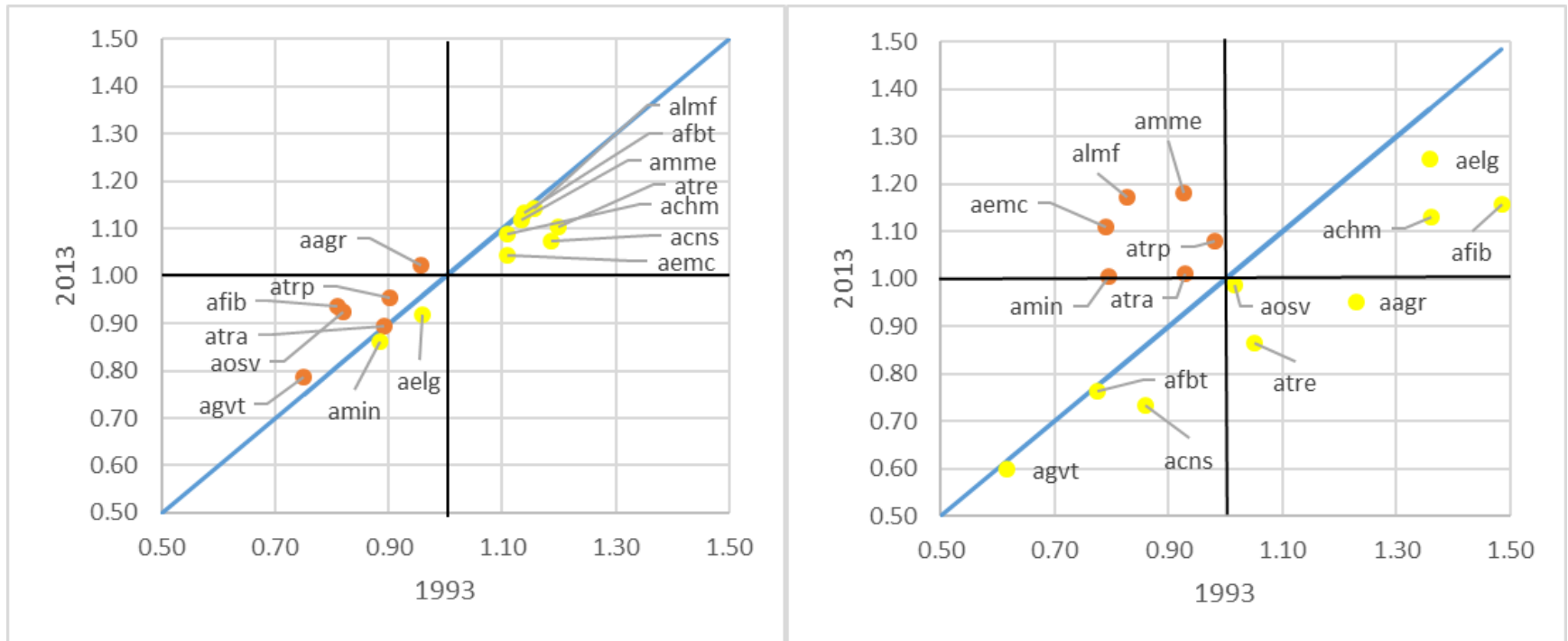
Backward

Forward

- Can use linkages to classify sectors according to their connectedness and see how they have evolved

Classification of sectors

	Classification 1993	Classification 2013
01_aagr	Dependent on Demand	Dependent on Supply
02_amin	Generally Independent	Dependent on Demand
03_afbt	Dependent on Supply	Dependent on Supply
04_almf	Dependent on Supply	Generally Dependent
05_achm	Generally Dependent	Generally Dependent
06_amme	Dependent on Supply	Generally Dependent
07_aemc	Dependent on Supply	Generally Dependent
08_atre	Generally Dependent	Dependent on Supply
09_aelg	Dependent on Demand	Dependent on Demand
10_acns	Dependent on Supply	Dependent on Supply
11_atra	Generally Independent	Dependent on Demand
12_atrp	Generally Independent	Dependent on Demand
13_afib	Dependent on Demand	Dependent on Demand
14_agvt	Generally Independent	Generally Independent
15_aosv	Dependent on Demand	Generally Independent

Decompositions

- Use Leontief –style model to decompose change into technical and other

$$X = (I - A)^{-1}.f = L.f$$

$$\Delta X = \Delta L.f + L.\Delta f + \Delta X.\Delta f$$

change in output = weighted technical change + weighted demand change + covariance

- We play with variations on this theme

Some key decomposition results

- **Δ**gross output = **Δ**technology (8%) + **Δ**final demand (92%)

- **ΔGDP = ΔVA/X** (-34%) + **Δ**technology (12%) + **Δ**FD (122%)

- **ΔGDP = ΔVA/N** (74%) + **ΔN**(26%)

- **ΔVA/N** = **Δ**sector prod growth (85%) + **Δ**reallocation (15%)

- Role of technology change?

Policy relevance?

- Descriptive

- But suggest places to start hunting causes

- Framework within which policy impacts work

- Policy questions
  - How does what we describe influence effectiveness of particular policies?
  - Might policies target changing what we describe?
    - contingent outcomes
    - 'deep structure' – linkages etc

Future research

- Database available for researchers
  - Hunt causes

- Need to disaggregate
  - factors
  - income distribution

- Can then do multiplier decomposition