

Developing the automotive value chain: Some lessons from South Africa

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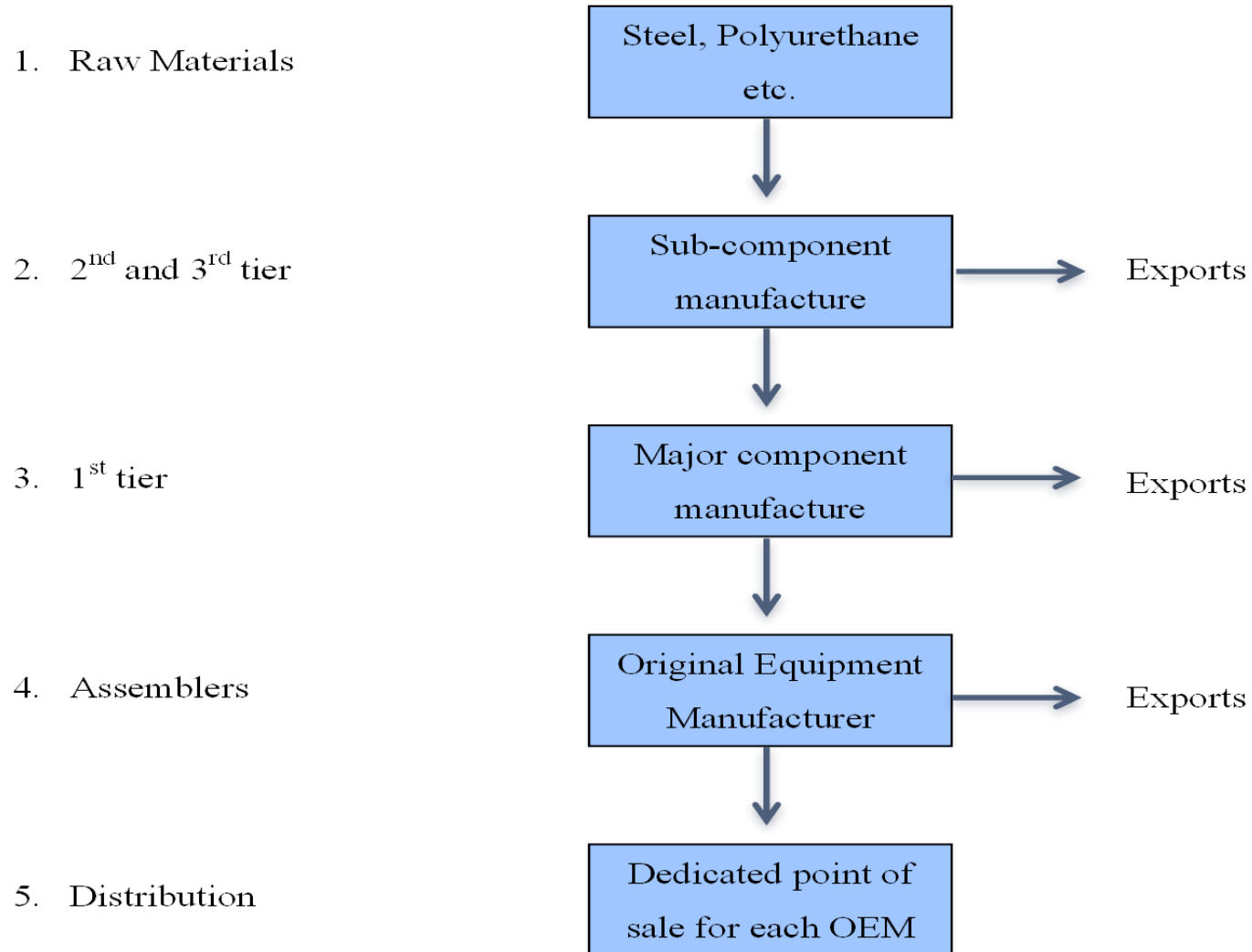
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Overview

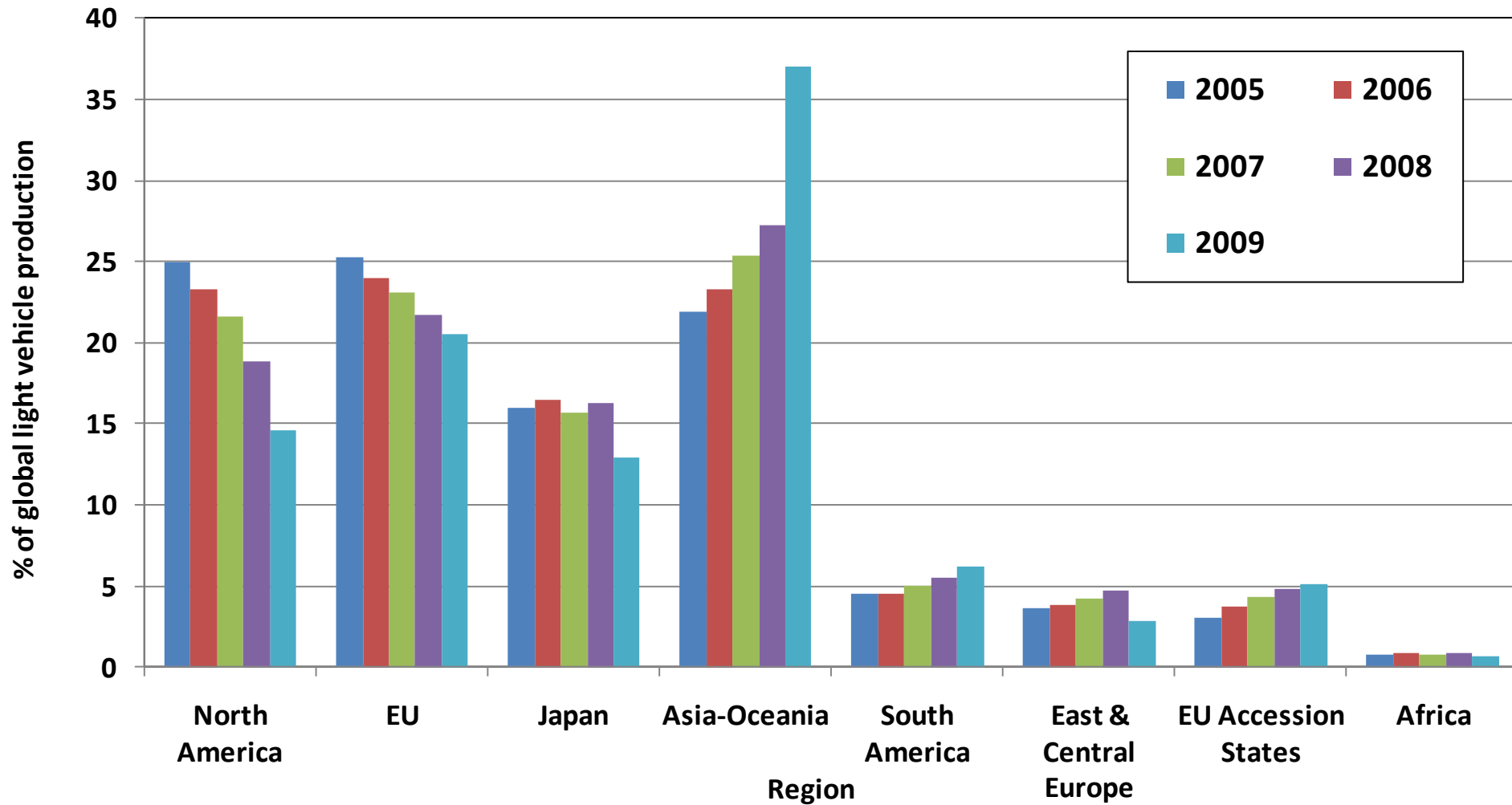
- The global automotive value chain: Implications for developing countries
 - SA in the global auto industry
- South Africa's automotive policy and its effects
 - Exports, local content and investment
- Technological capability and technology transfer
- Conclusions

The automotive value chain



The changing location of global light vehicle production

Global light vehicle production % by major automotive region



Viabile 'automotive spaces' for emerging producer countries in the global industry

- Protected autonomous markets
 - China, India
- Integrated peripheral markets
 - Mexico, new EU member states
- Emerging regional markets
 - ASEAN, Mercosur
- South Africa?

South African automotive policy I

- History of protection
 - high protection (115%)
 - local content requirement since 1961
 - 1989 – Phase VI
- Resulted in:
 - Substantial domestic development
 - But high costs and inefficiency
 - Low exports
 - Low volume, multimodel plants - minimum efficient scale not achieved

South African automotive policy II

- 1995 – Motor Industry Development Programme (MIDP)
 - Local content requirement abolished
 - Gradual tariff reductions
 - 1995 – 65%
 - 2012 – 25%
 - Import-export complementation
- Objectives
 - Phased integration into global industry
 - Increased volume and economies of scale through growing exports and gradual rationalisation
- 2013 – Automotive Production and Development Programme (APDP)

Stages in the development of vehicle production in South Africa

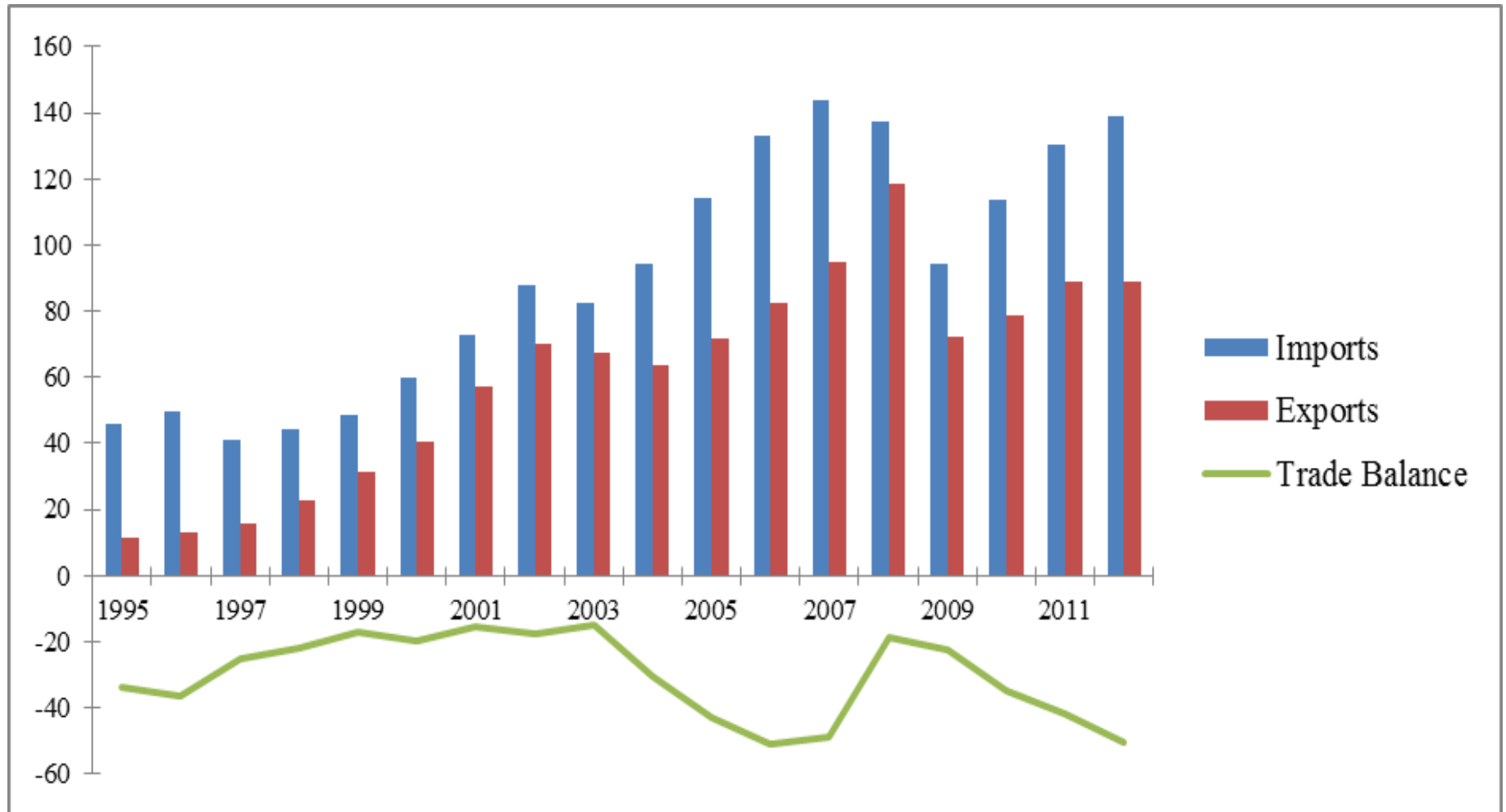
	CKD assembly	Transition	Full manufacturing
Target market	Domestic	Domestic and export	Domestic and export
Level of integration with parent company	Low; import of CKD packs	Medium	High
Model line up	Many models	One or two	One or two
Derivatives	Limited to reduce costs	Full range to supply export market	Full range to supply export market
Local content	Generally low - may be high as a result of local content rules	Moderate based primarily on cost factors	Medium to high
Quality	Below source plant	Equal to source plant	Equal to source plant
Production cost	High	Medium; penalties incurred by high logistics costs	Low
Domestic design	Local adaptations	None	None - may do world wide R&D in niche areas

The impact of greater openness: growth performance since 1995

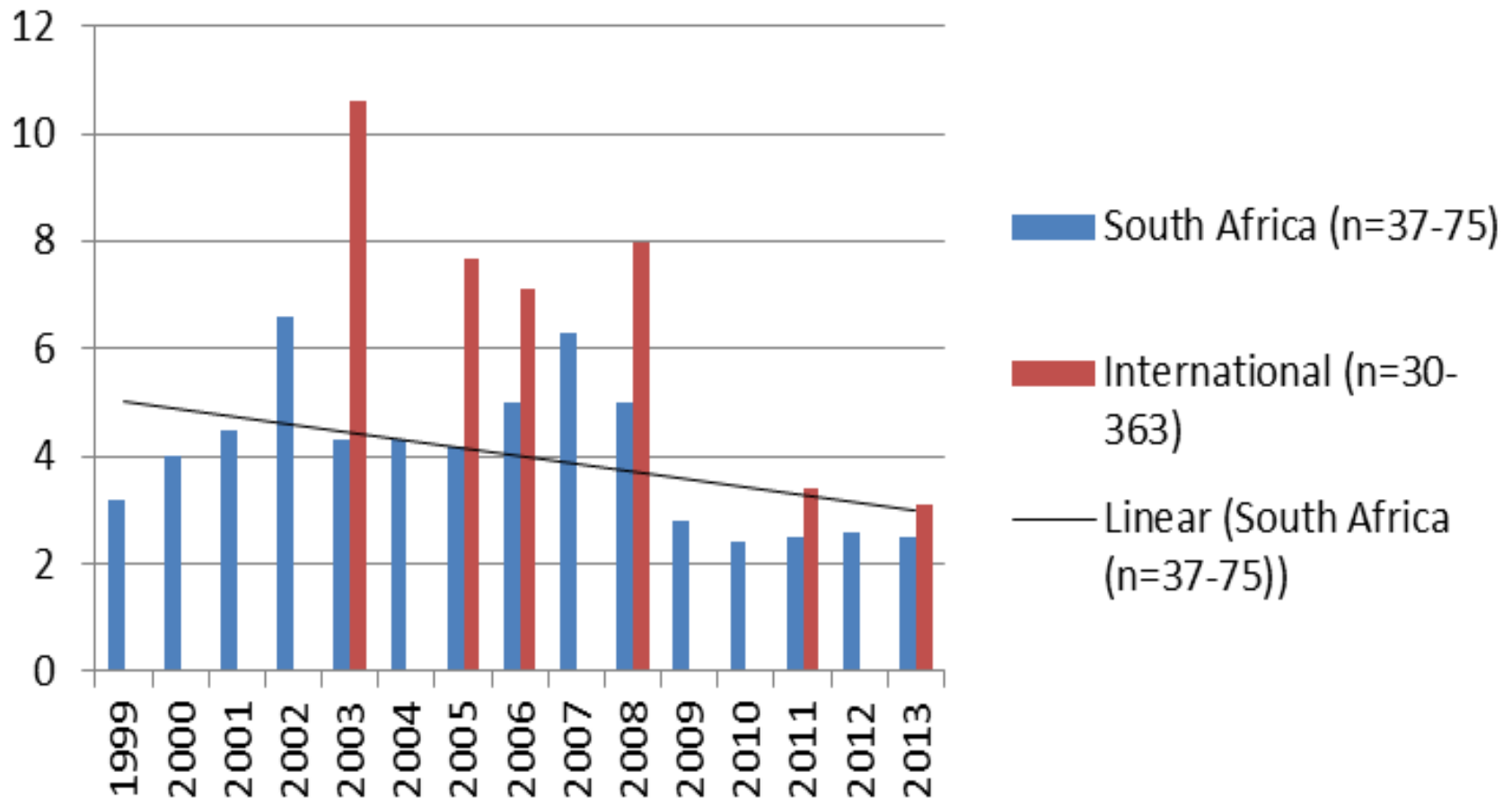
- Rapid growth in imports and exports of both vehicles and components
 - Local content level maintained at fairly low level; Large increase in share of imported vehicles in domestic market
- Modest investment growth
- Some rationalisation
- Competitiveness and productivity improve but behind global competitors
- Employment stable
- Much greater foreign ownership
 - Decline in local R&D?

Automotive Trade Balance, 1995-2012

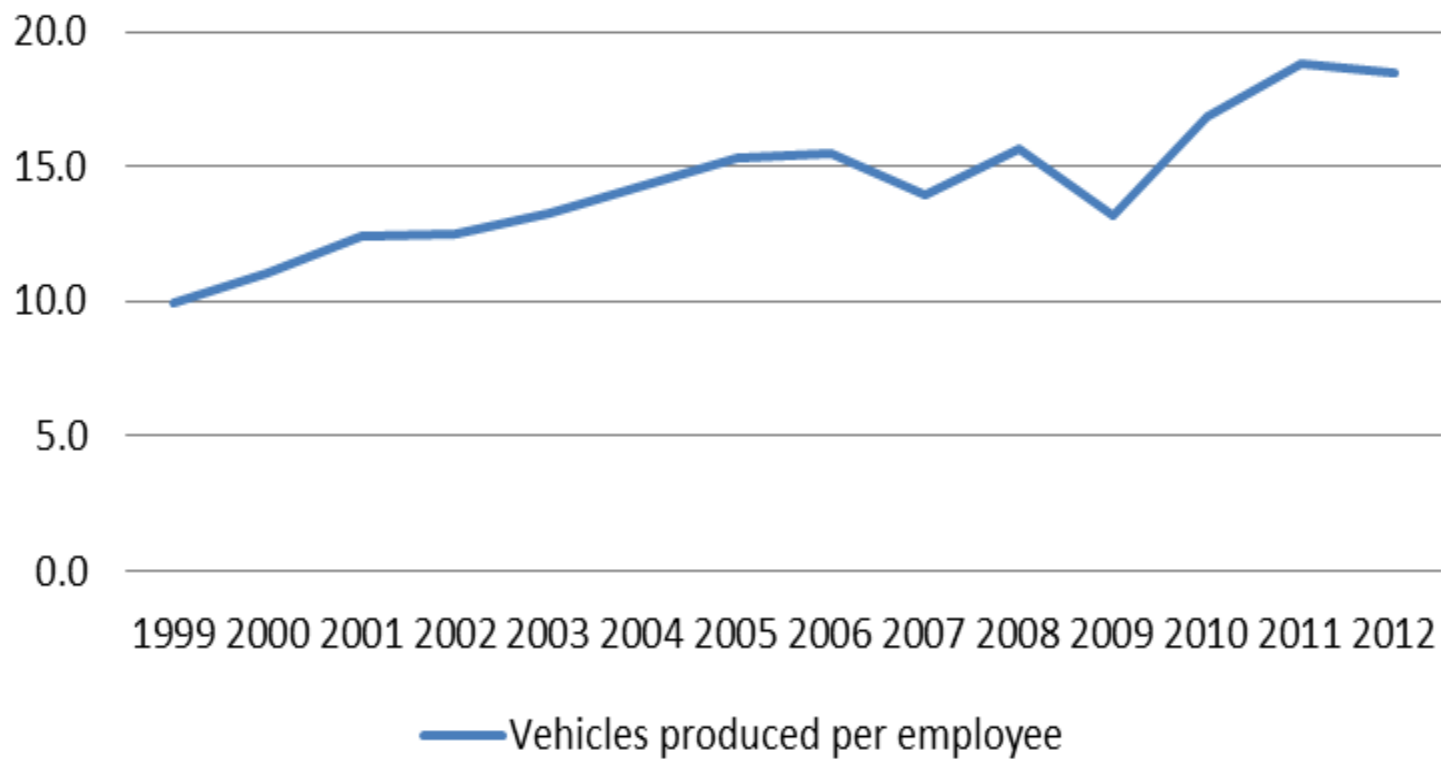
(R billion, constant 2012 prices)



Capital expenditure as a % of sales at firms benchmarked by the SAABC, 1999 to 2013



Vehicles produced per employee at South African OEMs (1999-2012)



Competitiveness improvements in the performance of the South African automotive components industry, 1998/9 to 2012, and international comparisons

Market driver	KPI	South African performance standards				International standard 2012, n=26-59	SA vs. International standards, 2012
		1998/9, n=23-27	2006, n=61-75	2012, n=29-36	Change 1998/9- 2012		
Cost control	Inventory holding (operating days)	62.6	33.3	26.2	58.1%	24.5	-6.5%
Quality	Customer return rate (ppm)	3,270	254	226	93.1%	199	-11.9%
	Internal reject rate (%)	4.9	2.6	1.7	65.3%	1.6	-5.9%
	Internal scrap rate (%)	4.2	2.8	1.7	59.5%	1.5	-11.8%
Reliability	OTIF delivery reliability to customers (%)	92.2	93.5	97.7	6.0%	97.9	-0.2%
	OTIF delivery reliability from suppliers (%)	78.7	90.0	92.5	17.5%	93.3	-0.9%
Human Resources	Absenteeism – lost hours (%)	4.4	3.3	3.0	31.8%	2.6	-13.3%

Technological development

- Relatively little R&D
- Dependence on technology licenses
- Technological capabilities
 - Low volume, flexible production;
 - Process technology
 - Limited product technology

Modes of technology transfer

- Purchase of equipment
- Technology agreements and licensing
- Role of TNCs
 - Foreign ownership has increased
- Accelerated upgrading
 - Conduit is mainly via foreign sources rather than domestic R&D
 - Evidence that local R&D is downsized
 - Level of export orientation the same for both foreign and local firms

Major channels for technology transfer for automotive component firms

Rank	Foreign firms	Domestic firms
1	Embodied in machinery (25%)	Embodied in machinery (25%)
2	Developed with a supplier (13%)	In house development (19%)
3	Hire of foreign personnel (13%)	Domestic licensing (17%)

Modes of technology transfer (continued)

- Supplier development
 - e.g. Toyota
- R&D
 - e.g. Behr
- Industry research collaboration
- Quality standards
- Training

Summary of expenditure on R&D and training for South African automotive component suppliers, 2003-2006

Indicator	South African average (n=72)					International average (n=72)
	2003	2004	2005	2006	2003-06	2006
R&D expenditure as % of sales	1.5	2.0	1.6	1.5	1.6	3.0
Training expenditure as % of sales	5.0	4.3	4.2	5.0	4.6	7.1

Global competitiveness indices for South Africa and comparator countries,
2012 (selected indicators)
(Rank out of 142)

	South Africa	China	Thailand	Russia	Korea	Germany	Japan	USA
GDP/capita US\$ (2010)	7,158	4,382	4,992	10,437	20,591	40,631	42,820	47,284
Global competitiveness index 2011-2012	50	26	39	66	24	6	9	5
Higher education and training	73	58	62	52	17	7	19	13
Tertiary education enrolment, gross %	97	85	54	13	1	n/a	35	6
Quality of management schools	13	59	73	107	50	36	57	12
Technological readiness	76	77	84	68	18	14	25	20
Firm -level technology absorption	30	61	75	130	8	14	3	18
Internet users/100 pop.	105	75	93	57	10	12	15	18
Innovation	41	29	54	71	14	7	4	5
University-industry collaboration in R&D	26	29	39	75	25	13	16	3
Availability of scientists and engineers	111	33	49	72	23	41	2	4

Conclusions

- Important lessons for emerging market industries
- Substantial autonomous development but also dependence on foreign technology
- Rapid shift to export orientation - but SA not an export platform
- Some protection is essential
- Importance of industry structure
 - High effective rates of protection require industrial policy to achieve economies of scale
- Direct support for R&D of little benefit given key role of foreign firms
 - Rather focused support to attract multinational R&D?
- Impact of STI policies has been limited
 - Large role of foreign firms; lack of large local firms
 - High rates of investment not achieved
 - Relatively weak STI institutional infrastructure