



Industrial Development Think Tank (IDTT)

Structural Transformation in the Auto Sector: Industrial Policy, State-Business Bargaining and Supply Chain Development

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Table of Contents

1. Introduction	1
2. The development of the SA industry in an international context	2
2.1. Global production and policy	2
2.2. The development of the South African auto industry	3
3. Structural Transformation in the auto sector: Achievements and current competitiveness ..	7
3.1. Structural change and productive transformation	7
3.2. Structural change in historical perspective	8
3.3. Competitiveness of the sector in relation to international benchmarks	11
4. Industrial Policy and Government Support: assessing the incentive structure	15
4.1. How do South African automotive incentives compare internationally?	15
5. Determinants and constraints to structural change: bargaining and ownership	19
5.1. State - business bargaining and the role of multinational firms.....	19
5.2. Changing ownership and its impact	20
6. Major challenges: localisation and supply chain development.....	21
6.1. Analysis of the supply chain.....	22
6.1.1. Component Exports	24
6.2. The underdevelopment of the supply chain.....	26
6.3. Technological capabilities	27
6.4. Localisation, BBBEE transformation and supply chain development.....	27
6.5. Existing initiatives.....	30
6.5.1. NAAMSA	30
6.5.2. NAACAM	31
6.5.3. Automotive Supply Chain Competitiveness Initiative (ASCCI).....	32
6.5.4. Automotive Industry Development Centre (AIDC)	33
6.5.5. Durban Automotive Cluster (DAC)	34
7. Auto policy and institutional fragmentation: Implementation challenges	35
7.1. Political intrusion in technical processes	35
7.2. Intra-departmental misalignment.....	36
7.3. Inter-departmental misalignment.....	37
8. Looking ahead: Regional markets and technological change	38
8.1. African market dynamics and emerging production capacity (outside of SA)	38

8.2.	The potential for the development of regional value chains.....	42
8.3.	Technological change: Future drivers of GVCs in developing countries.....	44
8.3.1.	Developed economy fuel economy requirements and the movement to high technology, smaller displacement internal combustion engines	44
8.3.2.	The evolution of electric engine technologies.....	45
8.3.3.	Green manufacturing requirements.....	46
8.3.4.	New materials	46
8.3.5.	Infotainment and vehicle connectivity developments.....	46
8.3.6.	The disruptive potential of autonomous vehicles	47
8.3.7.	The emergence of mobility services as potential displacement of private vehicle ownership	47
9.	Concluding remarks: Policy implications and recommendations	48
10.	References.....	51

List of Figures

Figure 1: Local OEMs' Customer Benchmark Index (CBI) scores for 2014-2016**	14
Figure 2: Value Added (VA) per unit of total employee costs**	14
Figure 3: Global vehicle production of South African assembled models	15
Figure 4: Defining a sustainable automotive policy framework	16
Figure 5: Breakdown of local content within component supply to six of South Africa's seven OEMs, Jan-March 2017	23
Figure 6: Value addition breakdown of global and South African automotive supply chains	27

List of Tables

Table 1: Changes in South African OEM ownership since 1995.....	5
Table 2: South African production profile for major vehicle categories	7
Table 3: Production volumes for models at a single plant in the 1990s	9
Table 4: Stages in the Development of Vehicle Production in South Africa	11
Table 5: OEM vehicle production per employee, 2006 to 2016	12
Table 6: Competitiveness improvements in the performance of the South African automotive components industry, 1998/9 to 2016, and international comparisons	13
Table 7: Comparative market access and production dynamism of 12 selected economies and South Africa	18
Table 8: South African OEM manufacturing sales and associated import and local content values (Rand billions)	22
Table 9: Major component export categories, 1995-2015 (R million)	24
Table 10: Ad valorem tax on locally produced CBUs, relative to ad valorem tax on equivalent imports (at various price points) – SA vehicles at a 25% price premium.....	38
Table 11: The market for new and used light vehicles in SSA, 2003-2013 (000s)	39
Table 12: Comparison of Indian and sub-Saharan African markets, production and trade, 2013	40

Abbreviations

AGOA	African Growth and Opportunities Act
AIDC	Automotive Industry Development Centre
AIEC	Automotive Industry Export Council
AIS	Automotive Investment Scheme
APDP	Automotive Production and Development Programme
ASCCI	Automotive Supply Chain Competitiveness Initiative
ASEAN	Association of Southeast Asian Nations
AV	Autonomous Vehicle
BAIC	Beijing Automobile International Corporation
BBEEE	Broad Based Black Economic Empowerment
BEE	Black Economic Empowerment
BEV	Battery Electric Vehicle
BTI	Board of Trade and Industry
BTT	Board on Tariffs and Trade
CBI	Customer Benchmark Index
CBU	Completely built up
CCIG	Catalytic Converter Interest Group
CEO	Chief Executive Officer
CET	Common External tariff
CFO	Chief Financial Officer
CFTA	Continental Free Trade Area
CKD	Completely knocked down
DAC	Durban Automotive Cluster
DFA	Duty Free Allowance
DST	Department of Science and Technology
DTI (later dti)	Department of Trade and Industry
EAC	East African Community
ECOWAS	Economic Community of West African States
ECU	Engine Control Unit
EEV	Energy Efficient Vehicle
EPA	Economic Partnership Agreement
EU	European Union
FTA	Free Trade Agreement
GAFTA	Greater Arab Free Trade Area
GATT	General Agreement on Tariffs and Trade
GCC	Gulf Cooperation Council
GDP	Gross Domestic Product
GVC	Global Value Chain
HS	Harmonized System
IAT	Import Adjustment Tax
ICE	Internal Combustion Engine
IDC	Industrial Development Corporation

IDZ	Industrial Development Zone
IMF	International Monetary Fund
IRCC	Import Rebate Credit Certificate
ISO	International Standards Organisation
JSE	Johannesburg Stock Exchange
KPI	Key Performance Indicator
LCV	Light Commercial Vehicle
LDC	Less Developed Country
LDV	Light Delivery Vehicle
M&HCV	Medium and Heavy Commercial Vehicle
MENA	Middle East and North Africa
MERCOSUR	Southern Common Market
MIDP	Motor Industry Development Programme
MNC	Multinational Corporation
NAACAM	National Association of Automotive Component and Allied Manufacturers
NAAMSA	National Association of Automobile Manufacturers of South Africa
NAC	National Automotive Council
NAFTA	North American Free Trade Area
NAIDP	National Automotive Industry Development Plan
NUMSA	National Union of Metalworkers of South Africa
OE	Original equipment
OEM	Original equipment manufacturer (vehicle producer)
OICA	Organisation of Motor Vehicle Manufacturers
PAA	Productive Asset Allowance
PGM	Platinum Group Metal
PHEV	Plug-in Hybrid Electric Vehicle
PI	Production Incentive
R&D	Research and Development
SA	South Africa
SAABC	South African Automotive Benchmarking Club
SAAM	South African Automotive Masterplan
SACU	Southern African Customs Union
SADC	Southern African Development Community
SARS	South African Revenue Service
SKD	Semi knocked down
SSA	Sub-Saharan Africa
SUV	Sports Utility Vehicle
TFTA	Tripartite Free Trade Area
US	United States
VAA	Volume Assembly Allowance
VALA	Volume Assembly Localisation Allowance
VAT	Value Added Tax
VW	Volkswagen
WTO	World Trade Organisation

1. Introduction⁴

The South African auto industry has benefited from large scale state support for nearly a century. Initially this took the form of import protection and from the 1960s, included a series of local content regulations. More recently it has been the recipient of targeted industrial policy intervention, which opened the industry to international competition but also provided export, production and investment subsidies. These interventions are considered to have been fairly successful and the industry is much more internationally competitive and a major exporter.⁵ But it has never quite lived up to its promise and does not constitute a 'leading sector'. Imports are high and the industry continues to run a significant trade deficit. Local content remains low. Overall, South Africa has not developed the characteristics of a real auto hub such as Thailand or Mexico.

After outlining the global context and the development of the industry (section 2), this report then goes on to assess, in section 3, structural change in the sector and its competitiveness in relation to international benchmarks. This clearly has to be seen in relation to the support it receives; and section 4 consequently provides a comparison of South African incentives in relation to those available internationally. The report then goes on to focus on two key areas. The first of these (section 5) is the vexed area of bargaining with multinational firms. Since 1994 the assembly industry has become 100% foreign owned and domestic ownership has also declined sharply among first tier component suppliers. The industry receives substantial state support and the level and type of support is the subject of intensive lobbying by leading multinational firms. The state, for its part, would like to deepen local content but has so far met with limited success.

The second key issue (section 6), therefore deals with supply chain development. Why are the second and third tiers so weak? What can be done to expand such segments? This is the area where small firms, and perhaps national capital (potentially, black owned firms), could emerge but have not done so. Instead, the sector has contracted in relative terms under severe competitive pressure. This section also provides an analysis of measures to promote the component sector and to develop black ownership in the supply chain.

Seeking to assess current sector strengths and weaknesses, and trying to derive conclusions from the two areas above, the report also examines policy implementation issues, with particular reference to institutional fragmentation (section 7). Section 8 deals with two key areas for the future. These are the development of regional value chains and the implications of technological developments in the global industry. The rest of Africa has enormous potential but there is minimal production outside of South and North Africa and regional value chains hardly exist. Given the

⁴ Helpful comment on previous drafts by Simon Roberts, Antonio Andreoni and participants in IDTT workshops is gratefully acknowledged.

⁵ In his overview of economic reform since 1994, Hirsch (2005:159) cites the Motor Industry Development Programme as one of the "notable successes" of this period. Barnes, Kaplinsky and Morris (2004) argue that it helped develop dynamic competitive advantage in the industry while acknowledging weaknesses in the component sector. Flatters and Netshitomboni (2007) take a much more critical view, citing the heavy costs of the MIDP and arguing for more rapid liberalisation.

small size of most markets, regional integration is essential to the establishment of regional value chains. Technological developments ranging from electric to self-driving cars have once again placed the car industry at the forefront of global technology development with major implications for developing country industries, including South Africa. Section 9 concludes with some reflections on industrial policy and considerations for the future.

2. The development of the SA industry in an international context

2.1. Global production and policy

The automotive industry is one of the world's largest manufacturing industries and has frequently been identified as emblematic of national industrialisation. As such it has been the recipient of extensive state attention and support. Given the size and visibility of the sector this is not altogether surprising and governments all over the world have tried to promote their domestic automotive industries in various ways.

In developing countries, these support measures initially included high tariffs on imported vehicles and local content requirements. Indeed, the automotive industry was an important pillar in import substitution programmes, especially in larger countries. From the 1980s, again echoing global trends, support moved to the promotion of exports and was accompanied by trade liberalisation. Direct investment support and a wide range of other inducements have also been put in place and countries (and regions within countries) compete fiercely to attract major plants mainly to the advantage of investing multinational firms (Pavlinek, 2015). Indeed, the rapid development of the industry in many global locations ranging from Brazil and Mexico to Turkey and Thailand has been driven by foreign investment with the role of domestic firms in decline.

Various countries have also embarked on more specific industrial policies. These have included efforts to rationalise production by reducing the proliferation of makes and models being domestically assembled. The objective here has been to achieve economies of scale in order to encourage a deepening of the domestic supply chain. There have also been policies to promote indigenous firms, often at great cost as in the case of the Proton and Perodua projects in Malaysia. In other countries, such as in central Europe and Turkey, there have also been efforts to attract major investments in R&D.

Automotive policy has fundamentally shaped the development of the industry, and this policy itself has been highly contested. In considering the nature of state intervention, there are broadly three typologies. The first is an effective developmental state, the second is characterised by the dominance of domestic rent seeking interests and the third is the case where policy is driven by the global interests of multinational corporations, potentially resulting in an adverse mode of incorporation into global markets (Black et al, 2017). Governments have had certain objectives – mainly GDP contribution, employment growth and foreign exchange savings - but industry stakeholders, primarily the major firms, have played a vocal and frequently influential role in the development of policy with both positive and negative effects. Major multinationals have therefore been of specific and growing importance and a central element has been the interaction between

the developmental ambitions of government and the strategies of major firms, whose decisions are based on optimising their global position in an increasingly competitive world market.

A key dynamic, therefore, is that of the bargaining between (mainly foreign) firms and governments.⁶ The bargaining power of these governments is dependent on the size and dynamism of the domestic (or regional) market and on the capacity of the government bureaucracy to engage with MNCs. China, due to its huge market, obviously has exceptional leverage in this respect and has been able to insist that MNCs form joint ventures with domestic firms and transfer technology to these firms. Other developing countries are in a far weaker bargaining position.

Industry outcomes in individual country contexts consequently depend in large part on what multinationals do – on the upside this could include developing the national industry as a major production hub within their global networks, investing heavily in the supply chain, and even undertaking R&D. The downside would be more limited investment in basic assembly processes to meet domestic policy requirements, a lack of investment in the supply chain and overall a more superficial engagement, based on the host country being perceived as a peripheral market rather than a production base. In some circumstances, local brands that are (at least initially) heavily dependent on foreign technologies might also emerge, probably with government support. But this has not been the case in South Africa and foreign firms have become increasingly dominant in the component sector as well. South Africa also has numerous disadvantages, having a relatively small, non-dynamic market⁷ and being remote from major markets. This means that its bargaining power is limited with respect to foreign firms.

2.2. The development of the South African auto industry

The early development of the South African industry was fundamentally shaped by protection. High tariffs were placed on built up vehicles, which when combined with a rapidly growing market, acted as a magnet to many (initially foreign) companies, which established assembly plants in the country, frequently in the form of joint ventures with local firms. These operations, although in many cases highly profitable, were very small in international terms with correspondingly high unit costs. Production was aimed solely at the domestic market (Black, 2009).

The first in a series of local content programmes was introduced in 1961. Net local content rose rapidly, reaching approximately 52% by mass by 1971, which marked the end of Phase II of the programme. In later phases, the local content requirement (on a mass basis) was raised to 66%. In all these developments the main motivating factor for increasing local content remained the desire to save foreign exchange. By late 1986, there were seven assemblers producing over 20 basic model variants for a market of only 172,000 passenger cars. These low volumes meant that the industry was uncompetitive. Exports were minimal but there had been substantial development of a domestic supplier industry (Black, 1994; Duncan, 1997).

⁶ For examples in different country contexts, see Doner (1991, 2009); Miozzo (2000) and Pavlinek (2015).

⁷ South Africa accounts for only 0.6% of the global market.

The Phase VI local content programme, introduced in 1989, marked a significant change in direction by allowing exports to count as local content. Many component suppliers and all the assemblers instituted significant export drives. From an early stage, therefore, the vehicle producers played a key role in the export of components by providing access for suppliers into their global network. The level of protection on built up vehicles, however, remained prohibitive with nominal protection of 115% (100% ad valorem plus 15% surcharge). Phase VI came in for heavy criticism with frequent changes adding to the atmosphere of uncertainty (Black, 1994). There was also pressure from the component producer federation, NAACAM, who were concerned about rising import competition. For its part, government made it clear that tariffs had to be reduced in line with WTO obligations.

The advent of democracy in 1994 was followed by the introduction of the Motor Industry Development Programme (MIDP) in 1995. The MIDP continued the direction taken by Phase VI and entrenched the principle of import-export complementation. However, it went a step further by abolishing local content requirements and introducing a tariff phase down at a steeper rate than required by the terms of South Africa's offer to the GATT. South Africa was opening to the world and tariffs were being liberalised across the board. In the auto sector, import-export complementation enabled assemblers to use import credits to source components at close to international prices. Declining nominal protection on vehicles was, therefore, largely compensated for by reduced protection for components, again as a result of strong pressure by vehicle producers, all of which were either foreign owned or with licence agreements with MNCs.

The MIDP was devised as a trade facilitating measure with very particular industry policy objectives. With the proliferation of makes and models being produced in low volumes in South Africa, component firms had in turn been required to produce at volumes below minimum efficient scale. A key objective of the MIDP was, therefore, to increase the volume and scale of production through a greater level of specialisation in terms of both vehicle models and components. This could be achieved by exports of locally produced, high volume vehicles which could earn import credits to be used to import additional models for sale in the domestic market.

Until the early 1990s, high protection resulted in very low volumes of vehicle imports. With the liberalisation that began in earnest with the introduction of the MIDP, total imports of vehicles and components grew at a faster rate than policy makers expected. The nominal tariff on light vehicles, at 25% was still reasonably high and so could not, on its own, explain the rapid increase in automotive imports. The key factor was that the MIDP enabled firms to rebate import duties by exporting.

Vehicle producers were happy to accept reductions in tariffs from very high levels but initially registered growing concerns about proposed reductions below 40%. However, as they derived a growing proportion of their revenue from the importation of vehicles (and components), much of the strategic behaviour of firms became directed at optimising their duty position. This was reflected in their firm level strategies as well as interventions to influence government to ensure that the import credits they earned from exporting were only phased down very slowly. From 1996-

2011, the average level of duty paid by vehicle manufacturers was only 0.6% of the total value of their imports of vehicles and components over this period.⁸

The growth of automotive exports has been one of the most striking features of the development of the automotive industry under the MIDP. Its incentive structure strongly favoured exports. But the very strong supply response to changes in the policy regime is also partly attributable to the nature of the automotive industry value chain. From 1994 there was a process of investment or reinvestment by MNCs with all seven light vehicle producers rapidly becoming 100% foreign owned (Table 1). One of the factors driving the takeover of domestically owned plants by licensees was the need to upgrade the South African plants in the face of growing competition. To achieve scale, exports were essential and this was unlikely to happen from licensed as opposed to wholly owned plants.

Table 1: Changes in South African OEM ownership since 1995

South African OEM	Ownership 1995	MNC ownership since the mid- 2000s
Toyota SA Motors	100% local (JSE listed, Wesco main shareholder)	Toyota
Volkswagen SA	Volkswagen AG	Volkswagen AG
BMW SA	BMW AG	BMW AG
Mercedes Benz SA	Joint venture: Daimler AG and Volkskas Bank	Mercedes Benz
Ford (Samcor)	100% Anglo American	Ford
Nissan (Automakers)	100% Sankorp	Nissan
General Motors (Delta)	100% local management	General Motors (Isuzu since January 2018)

Source: Adapted from Barnes et al (2016a)

The MNCs were able to rapidly facilitate exports either from their own South African operations or from South African based suppliers to their international operations. This enabled them to expand their exports and offset import duties on cars and parts.

While trade and industrial policy has provided significant support especially for exports, there have also been substantial improvements in productivity. However, this still lags countries such as Thailand in terms of manufacturing costs (Barnes et al, 2017). Part of the competitiveness deficit can be accounted for by the relatively low availability of skills, which is reflected in the high skills premium for technicians, artisans, professionals and managers. But Thailand has other advantages as well. Infrastructure costs such as port and rail charges are lower; and the country is highly specialised in the production of pick-ups partly because of specific tax policies. Import duties also remain high on built up vehicles (Barnes et al, 2017).

A highly contested issue in the development of the automotive sector both in South Africa and other developing countries has been the level of local content in domestically assembled

⁸ Calculated from unpublished Customs data.

vehicles.⁹ Government has been keen to promote greater depth of supply chain development by securing investment in first and second tier suppliers and this was one of the stated objectives of the Automotive Production and Development Programme (APDP) which replaced the MIDP in 2013. The bargaining power of the MNCs ensured that it remained relatively easy to import vehicles and parts into the South African market while offsetting almost all duties (Barnes et al, 2017). The recently developed 2035 South African Automotive Masterplan (SAAM) sets an objective of 60% local content, a substantial increase on the level of 38% currently achieved. It remains to be seen how this can be achieved in a policy environment which provides little protection for the component sector.¹⁰

Apart from the boom in 2005-2006, in real terms, there has only been a modest increase in investment in vehicle manufacturing. However, a major quite recent development has been the announcement by Beijing Automobile International Corporation (BAIC) that it will invest \$800 million to build a new assembly plant at Coega in the Eastern Cape (Engineering News, 2016). The plant is currently under construction and BAIC has recently also announced the establishment of a R2 billion supplier park in the Coega IDZ.¹¹ An interesting development is that South Africa's state owned Industrial Development Corporation (IDC) will have a significant share in the venture. This will make BAIC the only light vehicle producer with some local ownership. The reasons for this are not yet clear although it is probably seen by the investor as a way of ensuring government cooperation. The expansion in investment in the component sector has also been modest despite South Africa's automotive policy offering significant investment incentives in the form of the Automotive Investment Scheme (AIS).

The conversion of the MIDP to the APDP in 2013 heralded a significant change in government policy, with its explicit export support reoriented to production support irrespective of market focus. This was embodied in the move to a Volume Assembly Allowance (VAA) for OEMs and a Production Incentive (PI) for OEMs and component manufacturers. Apart from the need to ensure the alignment of South African automotive policy with the rules of the World Trade Organisation, a further intention was to reduce the industry's export bias, which had resulted in major production distortions since the MIDP's inception. This was most notable in the case of the exponential growth of catalytic converter exports (see section 6) which earned massive import credits thereby limiting the need for local content in South African assembled vehicles. However, while the way industry benefits were to be earned shifted significantly from the MIDP to the APDP, the way benefits were to be monetised remained largely unchanged, with export linked duty rebates substituted with production linked duty rebates. The policy 'paradox' of rewarding local production with import rebates was therefore extended to 2020. The objective of policy was that OEMs would balance their production between domestic market supply and exports under the APDP, while simultaneously balancing their CBU import programmes with local production for the South African market. However, neither has happened: OEMs have preferred to grow both their exports

⁹ This issue is discussed further in relation to both ownership (section 5) and supply chain development (section 6).

¹⁰ This issue is addressed in more detail in section 6.

¹¹ See BAIC to set up 2 billion components supplier park <https://www.fin24.com/Companies/Industrial/baic-to-set-up-r2bn-coega-components-supplier-park-20171210-2>

and their import programmes into South Africa. This decision appears to have been driven by two factors: (1) the strategic decision making of OEMs, and (2) the level of rebates earned per unit of local production. As indicated in Table 2 the share of exports in light vehicle production is high and has tended to increase since the inception of the APDP.

In respect of strategic choices, it would appear as if several OEMs identified the opportunity to increase their CBU export programmes under the APDP as an alternative to deepening their local content. This appears to have been driven by international CBU export opportunities (and frustrations with local technology capabilities and competitiveness levels) and the ability of OEMs to inflate the level of rebates earned through the Volume Assembly Allowance (VAA). As the VAA is based on the sales value of CBU production, as opposed to local value addition, OEMs can earn substantial rebates by exporting high value CBUs comprising predominantly imported components.

Table 2: South African production profile for major vehicle categories

Product	Market	2011	2012	2013	2014	2015	2016*
Passenger vehicles	Domestic	124,736	120,417	113,364	122,571	112,566	115,000
	Exports	187,529	151,659	151,893	154,920	228,459	250,000
	Total	312,265	272,076	265,257	277,491	341,025	365,000
	Export %	60.1%	55.7%	57.3%	55.8%	67.0%	68.5%
LCVS	Domestic	108,704	121,638	127,188	137,044	140,310	142,000
	Exports	84,125	123,443	121,345	118,585	102,664	135,000
	Total	192,829	245,081	248,533	255,629	242,974	277,000
	Export %	43.6%	50.4%	48.8%	46.4%	42.3%	48.7%
M&HCVs	Domestic	26,656	27,841	30,924	31,558	30,535	30,200
	Exports	803	1,076	1,206	1,412	1,124	1,100
	Total	27,459	28,917	32,130	32,970	31,659	31,300
	Export %	2.9%	3.7%	3.8%	4.3%	3.6%	3.5%

Source: Adapted from Barnes et al (2016c):32; AIEC, 2017

3. Structural Transformation in the auto sector: Achievements and current competitiveness

3.1. Structural change and productive transformation

The transformation of the South African auto industry from its protected position during apartheid to the post-apartheid globalisation era can only be understood if embedded within the political economic context in which it occurred. Indeed, its current configuration can be interpreted as the outcome of specific policy choices, the product of international competitive pressure, and a balance of power between state institutions, MNCs, domestic firms, and organised labour.

Overall, the targeted industrial policies in the auto industry have yielded mixed results. The sector has undoubtedly achieved improved industrial performance. From 1994-2014 it was the second fastest growing major sector although it has slumped since in response to a weakening economy (Bell et al, 2018: 7). Technological upgrading, higher volumes and a rationalisation of productive platforms have been accompanied by significant improvements in productivity and rapidly rising exports. However, important structural weaknesses remain.

For example, the growth in exports was strongly incentivised by the import-export rebate mechanisms designed as part of the MIDP; and continued with vehicle exports under the APDP. These worked as an incentive for firms to raise export volumes, but also as a disincentive to reduce the level of imports, which increased rapidly. At the same time, the generous concessions allowed to exporting firms reinforced a balance of power in favour of OEMs, which progressively gained bargaining strength in relation to state institutions and an even more dominant position in the value chain. Overall, the growing power of multinational OEMs, together with the increasing foreign ownership of first tier suppliers mitigated against the deepening of the value chain. Local content has either remained stable or tended to decline with the contraction most manifest among second and third tier suppliers. This has in turn led to stagnating employment.

These dynamics will be unpacked further in the following sections, which examine the competitiveness of the sector but also its main weaknesses. The successful transition to much greater export orientation has produced a much more technologically sophisticated industry. However, the process is still incomplete and, if structural weaknesses are not overcome and the balance of power not moderated, the future scenario is not promising.

3.2. Structural change in historical perspective

In the early 1990s, the South African automotive sector was widely regarded as inefficient and uncompetitive, and ultimately dependent on heavy protection for its existence. South Africa was far from major markets and the small domestic market showed little sign of growth. In the face of the prospect of globalisation, the prognosis for the industry was poor.

The period since 1995 has been a phase of rapid change. Longer term performance indicators suggest a fairly positive development picture given the industry's location in an underperforming economy. The share of imports grew sharply but there was a rapid increase in exports of both vehicles and components. Investment, including foreign investment increased, albeit at a modest pace. Significant rationalisation reduced the extreme proliferation of makes and models being assembled in small, uneconomic volumes. While there was some employment loss, the automotive sector fared well compared to South Africa's broader manufacturing sector. Vehicle prices also declined in real terms although they remained higher than in most first world markets. Quality and productivity improved significantly. Although the sector remains assisted, its structure is consequently more robust, more competitive and more oriented to global markets.

The issue of the scale of production is fundamental. The automotive industry remains scale intensive. In such industries, tariff protection in small domestic markets is likely to lead to the establishment of plants operating at below minimum efficient scale. Small scale assembly raises costs and adds little value. Low volume vehicle plants mean that in the absence of heavy protection, investment in component production is uneconomic beyond a very low level of local content. In a market with high effective rates of protection for vehicle assembly, it is economic for producers to build a wide range of models even in low volumes to be able to supply a full model range to the domestic market. However, the implications for the component sector are highly

adverse. The cost premium incurred by component makers for producing a wide range of products at low volume is considerable. The decision taken by assemblers to operate low volume, multiple model plants generates greater diseconomies external to the assembly process than internally. Suppliers are, therefore, severely disadvantaged by the decision of assemblers to proliferate production. Given that automotive components comprise the heart of the industry this imposes a binding constraint on industry development.

Table 3 presents the position in several developing countries that prevailed in the mid- 1990s. At that time many countries produced numerous very low volume models, a situation that was most evident in China, Malaysia, Indonesia and South Africa. These countries have now all moved on with most of their industries presently dominated by large scale, modern plants.

Table 3: Production volumes for models at a single plant in the 1990s

Country	Vehicle type	Production volumes (000s)				Year
		>100	50-100	20-50	<20 ^a	
China	Cars	1	1	2	7	1995
China	Pickups, utility vehicles, vans	0	1	8	19	1995
India	Cars	1	1	1	9	1995
Malaysia	Cars	1	1	1	14	1995 ^b
Malaysia	Vans	0	0	0	5	1995
Mexico	Cars	3	3	5	1	1997
Mexico	Pickups, utility vehicles	2	2	1	1	1997
Argentina	Cars	0	1	6	4	1997
Brazil	Cars	5	3	4	3	1997
Indonesia	Cars	0	0	1	13	1995
Indonesia	Vans, utility vehicles	0	1	2	10	1995
Thailand	Cars	0	1	3	7	1995
Thailand	Pickups	0	4	1	1	1995
S. Africa	Cars	0	0	4	17	1995
S. Africa	Pickups, utility vehicles	0	0	1	7	1995

Sources: Humphrey and Oeter (2000:61), DTI (1997:12), NAAMSA

Notes: ^a Excludes models with production of under 1000 units in the relevant year.

^b Data for Proton refers to 1997

Essentially what was sought was a transition from completely knocked down (CKD) assembly,¹² which has typically been characteristic of vehicle production in protected developing country markets, through a transition stage to full manufacturing (Table 4). CKD assembly involves relatively light investments and production costs are usually quite high especially if a high level of localisation is stipulated by government policy. High local content requirements would necessarily require much higher investment levels and would tend to encourage rationalisation. In a protected market, the cost of tooling up for new models and domestic content also encourages assemblers

¹² CKD assembly typically involves the assembly of imported 'kits' of components.

to skip the introduction of new models and introduce their own adaptations with the purpose of extending model life. As a result, in many protected, emerging economy markets, models have continued in production long after they have been phased out in advanced country markets. In South Africa, the VW Citigolf and Toyota Tazz were examples of this. In the CKD assembly stage, also, quality is likely to be below international standards.

In the transition and full manufacturing stages, where exports may become substantial, both quality standards and the number of derivatives offered, need to be in line with international practice.¹³ Production volumes per model also increase in the transition stage and under full manufacturing would approach world scale. Because firms are exporting, they would need access to components at world prices, so despite higher volumes in the transition stage, local content levels may not increase. In the full manufacturing stage, much higher volumes would normally be attained, encouraging vehicle makers to localise components on an economic basis.

The South African industry has made considerable progress in achieving a reasonable level of scale with current average model volumes in the region of 65,000 units per annum representing a huge improvement on the levels indicated in Table 3. Most OEMs could now be classified as having reached the 'full manufacturing stage' indicated in Table 4.¹⁴ However, as demonstrated in section 6, higher model volumes in the assembly sector have not been accompanied by higher local content; although there is no doubt that the component industry has become more competitive.

Policy has also produced distortions, encouraged uneconomic investments and led to unforeseen side effects. One of the most striking changes has been the rapid growth in exports and imports. The level of export assistance has been far too high, especially at the start of the MIDP. The orientation of the industry changed fundamentally away from its focus on the small domestic market; becoming 'ultra-export oriented'.¹⁵ Growing exports facilitated specialisation and the achievement of economies of scale. But this has had no substantive effect on increasing 'economic' local content. More evident, especially in the early stages, was the export expansion of 'peripheral' components such as automotive leather and catalytic converters (see section 6). The result was the growth of a large component export sector, which was not integrated with the low volume, low local content assembly industry supplying the domestic market. Another important effect of rapid export expansion was the increasing ability to rebate import duties, which added significantly to import pressure on the industry.

¹³ The term 'derivative' refers to the different permutations within a 'basic model'. Examples include engine size and body (e.g. saloon or hatchback) configurations. The carmaker would also have to offer more minor permutations such as a wide range of colours, types of steering wheel, levels of safety equipment, etc.

¹⁴ The exceptions are Nissan and Isuzu which have so far failed to land major export programmes, which would enable them to achieve large volumes per model.

¹⁵ This is a relative term as a number of countries export a greater share of their automotive production. It refers to the orientation of the trade regime and the fact that South Africa exports a high share of output given its remote location (Black, 2007).

Table 4: Stages in the Development of Vehicle Production in South Africa

Criteria	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 but may be quite high due to local content requirements	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 global R&D in niche areas

Source: Black (2009)

As mentioned previously, the assembly sector is now completely foreign owned as is a large portion of the component sector, especially at the critical first tier level. Foreign ownership has facilitated access to global networks. With few exceptions, domestically owned component firms neither possessed the technological capability to become independent first tier suppliers nor had ambitions in this direction. Many have been forced to reposition themselves as second tier suppliers, although they may have gained from being reintegrated into the global supply chains with much higher volumes.

The investments now being undertaken are generally on a larger scale than was the case previously and the industry is in a stable position with tariffs no longer declining under the APDP. Nevertheless, investments have been quite modest in relation to most other major developing country vehicle producers. There has been a substantial hedging of bets, for example, in the initial reluctance to make major investments in the assembly sector and more recently in the reluctance to intensively develop the domestic supply chain. The supply chain remains underdeveloped and heavily reliant on imports (see section 6). Essentially, the evidence presented does not indicate that South Africa is *en route* to becoming a major new production hub or export platform for the global automotive industry.

3.3. Competitiveness of the sector in relation to international benchmarks

Clearly, in the globalised market in which the South African industry operates, improving competitiveness over time is fundamental. Productivity, as measured by the number of light vehicles produced by vehicle assemblers in South Africa divided by their total number of employees, reveals substantial progress over the last decade. As indicated in Table 5, 14.2

vehicles were produced for each OEM employee in 2006, with this increasing to 18.9 vehicles in 2016, an improvement of 33%. While significant improvement has been recorded amongst South African OEMs, Turkey manufactured 1,358,796 vehicles in 2015, at an average of 27.9 vehicles per employee (Turkey employed 48,748 people across its 14 assembly plants in 2015)¹⁶. International comparisons of comparative assembly plant competitiveness are fraught with complexity, however, largely due to differentiated levels of capital intensity across primary and secondary assembly plants (with South Africa falling into the latter), and the substitutability of labour for capital where labour costs are comparatively low internationally (again, the case in South Africa).

Table 5: OEM vehicle production per employee, 2006 to 2016

	2006	2008	2010	2012	2014	2016	Change 2006-2016
Light vehicles produced per employee	14.2	15.7	16.0	16.9	17.5	18.9	33.0%

Source: NAAMSA (various publications)

The South African automotive components industry has similarly improved its operational competitiveness by a significant margin over the last two decades. This is evident in relation to operational effectiveness benchmarks such as inventory holding, customer quality performance, internal quality performance, operational reliability, and attendance management. As highlighted in Table 6, performance standards in the South African automotive components industry, at least amongst those firms benchmarked as part of the activities of the South African Automotive Benchmarking Club (SAABC) and the national Automotive Supply Chain Competitiveness Initiative (ASCCI), are generally superior to the performance standards of the international automotive component manufacturers benchmarked by B&M Analysts, the service provider to the SAABC, in 2016. Although not strictly comparable because of population changes in the benchmark dataset from 1998/1999 to 2016, the improvements recorded over the period are very substantial, with inventory holding improving 62%, quality performance to customers by 94%, and internal quality indicators by over 70%. The South African automotive components industry has clearly upgraded its operational competitiveness. And while the international firms referenced in Table 6 are not necessarily leading global competitors, it is instructive that the South African performance standards for 2016 are superior across six of the seven Key Performance Indicators (KPIs) explored.

The competitiveness challenge confronting the South African automotive industry extends beyond measures of operational effectiveness. A key issue relates to the cost effectiveness of South African production. According to OEMs interviewed in 2017, South African vehicle production is between 10% and 25% more expensive than the lowest cost production bases which range from India, to China, Mexico, Thailand, and Turkey. The OEM estimates are interesting insofar as they support two findings from the benchmarking activities of the SAABC. The first relates to the amount of value added created per unit of labour in the South African automotive components industry relative to international firms, and the second, to the levels of frustration OEMs express

¹⁶ Turkish data is from Barnes, Black, Comrie and Hartogh (2016b).

in relation to their South African suppliers' cost competitiveness when completing annual customer benchmarks for their component suppliers that are members of the SAABC.

Table 6: Competitiveness improvements in the performance of the South African automotive components industry, 1998/9 to 2016, and international comparisons

Market driver	KPI	South African performance standards						International standard 2016, n=68-114*
		1998/9, n=23-27	2001, n=23-27	2006, n=61-75	2012, n=29-36	2016, n=47-61	Change 1998/9-2016	
Cost control	Inventory holding (operating days)	62,6	42,0	33,3	26,2	23,7	62,1%	32,3
Quality	Customer return rate (ppm)	3 270	1 240	254	226	192	94,1%	472
	Internal reject rate (%)	4,9	3,9	2,6	1,7	1,5	70,5%	1,3
	Internal scrap rate (%)	4,2	3,5	2,8	1,7	1,2	71,5%	1,7
Reliability	OTIF** delivery reliability to customers (%)	92,2	92,7	93,5	97,7	97,3	5,5%	96,3
	OTIF delivery reliability from suppliers (%)	78,7	82,2	90,0	92,5	94,7	20,4%	91,2
Human Resources	Absenteeism – lost hours (%)	4,4	4,0	3,3	3,0	2,7	37,9%	4,6

Sources: Barnes and Morris (2008), SAABC database, accessed January 2014; October 2017

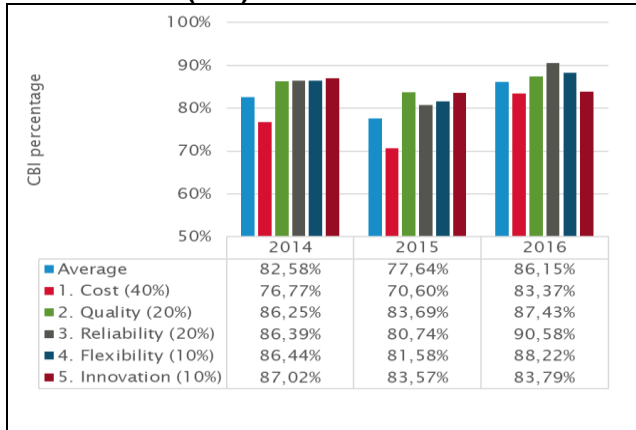
* International firms in the SAABC database are from Central Europe, India, the United States, and Mexico¹⁷

** On time in full.

As indicated in Figure 1 and Figure 2, the South African automotive components industry appears to have a major cost competitiveness deficiency. Figure 1 highlights that the seven South African based OEMs perceive their domestic automotive component firms to perform substantially better in respect of their quality, reliability, flexibility and innovation, than in terms of their cost competitiveness (although there has been a major improvement in cost competitiveness scores through to 2016), while Figure 2 reveals that the average South African automotive component manufacturer generated value added equal to 2.6 times their total employee costs, a figure that compares poorly to the 4.5 times recorded at Indian and Thai firms benchmarked in 2016. This data supports the findings from Barnes et al (2017), which revealed that Thailand had a substantial cost advantage over South Africa in respect of automotive assembly and component production.

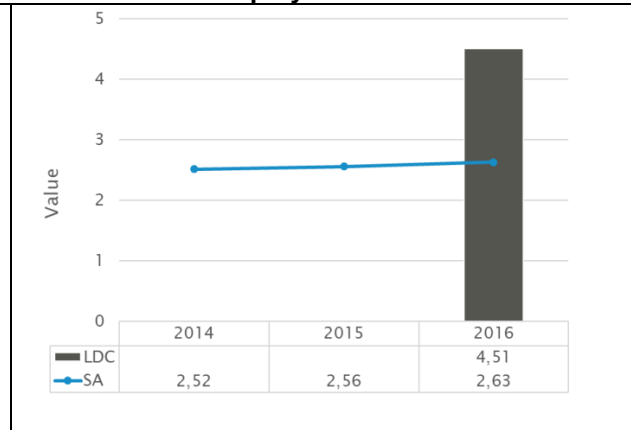
¹⁷ It is important to emphasise that the international firm data does not represent best practice performance standards, but rather the performance of a set of primarily Indian and Central European firms that participated in B&M Analysts' benchmarking programme in 2016 (along with a small number of Mexican and United States firms).

Figure 1: Local OEMs' Customer Benchmark Index (CBI) scores for 2014-2016**



Source: SAABC database, accessed October 2017

Figure 2: Value Added (VA) per unit of total employee costs**



Source: SAABC database, accessed October 2017

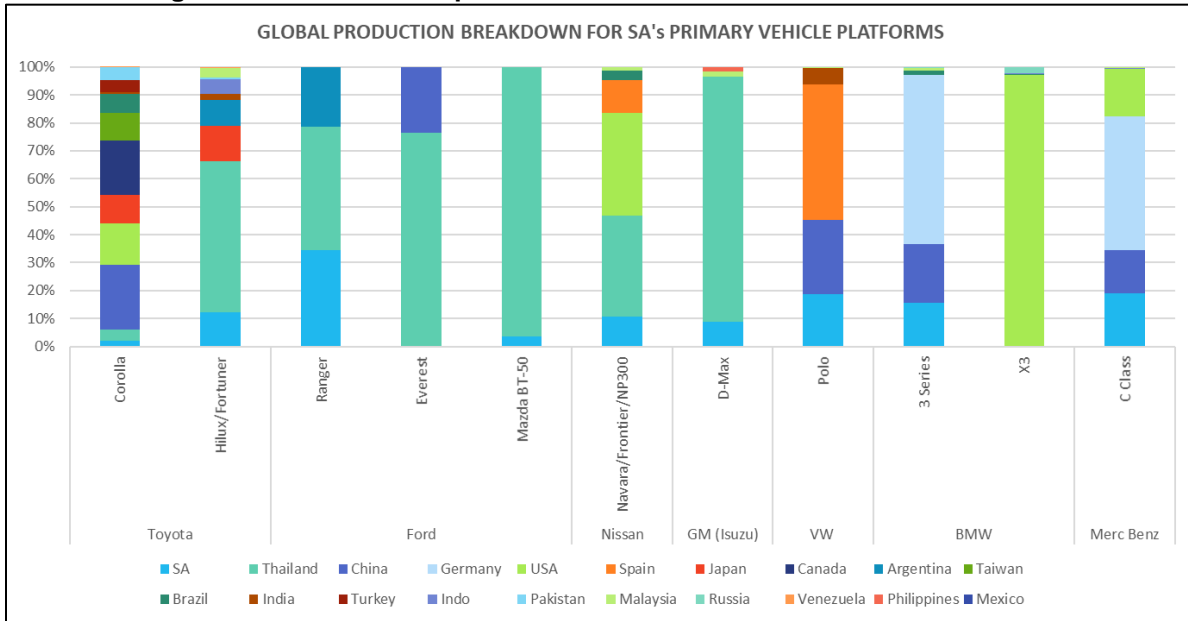
** CBI percentages for each element are calculated by weighting 10-point Likert-scale scores for component suppliers from the seven OEMs and then converting the scores into a percentage. The weighting for the average score is reflected in brackets.

** LDC relates to Indian and Thailand-based firms in the SAABC database only

One of the major reasons for the industry's comparative lack of cost competitiveness is that South Africa remains a marginal producer of models within global multinational families. As depicted in Figure 3, only the Ford Ranger features prominently in respect of global supply, with around one-third of Ford's global production of the Ranger located in South Africa. For the balance of domestically assembled models (including those that are primarily exported), South Africa's contribution to global production for any locally produced model is below 20%. This ensures that South Africa struggles to secure the local content needed to support the further development of the industry. The consequences are non-trivial. South African assembly operations typically have low local content as most component production is in primary model production locations. This results in high logistics costs (when importing components) and high production costs (when duplicating tooling for smaller volume local production). An analysis of individual model production, as shown in Figure 3, is revealing. Each of South Africa's major locally produced models is confronted with this challenge. Thailand dominates production of the Hilux/Fortuner (Toyota), Ford Ranger/Everest (Ford), and D-Max (Isuzu), while Spain dominates production of the Polo (VW), the USA the X3 BMW, and Germany C Class Mercedes Benz production.

While the South African automotive industry has established the ability to manufacture vehicles to exacting global standards, and to meet onerous operational requirements relating to quality, reliability, and flexibility, evidence suggests that the industry's lack of cost competitiveness (tied to several factors) represents its Achilles heel, hence its dependence on generous government incentives.

Figure 3: Global vehicle production of South African assembled models



Source: B&M Analysts (2017)

4. Industrial Policy and Government Support: assessing the incentive structure

4.1. How do South African automotive incentives compare internationally?

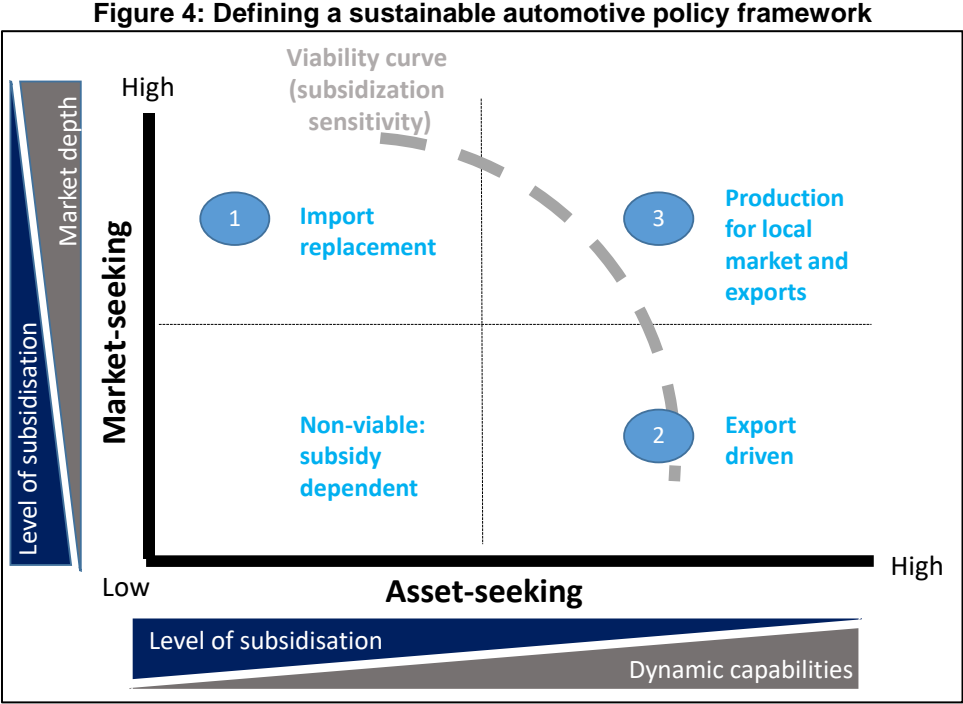
In all 'Tier 2' automotive producer countries including South Africa, securing initial automotive investment, and then sustaining it, has required a combination of market access and asset-based government incentives that have assisted in supporting the establishment of a viable automotive industry production space. Where government has withdrawn this support, as is the case in Australia, the automotive industry's production presence in the economy has been substantially reduced. Where government support has been well structured and targeted at building industrial capabilities in partnership with leading international vehicle manufacturers, substantial production capacity has been created. The examples that stand out in this regard are Thailand, Turkey, Mexico, Slovakia and, more recently Morocco.¹⁸ There are two key variables necessary to sustain the development of an automotive industry or 'automotive space':

1. The domestic/regional market advantage secured from investing in an economy, with increased market depth encouraging import replacement.
2. The competitive capabilities secured in an economy because of the investment, with a high level of dynamic capability (process and/or product) encouraging further investment in the economy and increasing the attraction of the economy as an export base.

Based on this basic categorization we can compile a two-by-two automotive industry viability matrix for an economy, as per Figure 4. The framework essentially identifies viable automotive spaces as import replacement-based, export driven, or (ideally) a combination of the two. The

¹⁸ Of course the cost of these incentives can be very high. See, for example, Pavlinek (2015) on the case of Slovakia and Vidican-Auktor and Hahn (2017) for Morocco.

framework also identifies an unfeasible quadrant, which we have termed ‘Non-viable: subsidy dependent’. The automotive industry’s sensitivity to subsidization reduces based on a dynamic interplay between market and asset-related benefits derived from an investment in an economy. So, as markets deepen, and as competitive capabilities develop, automotive industries require less subsidization from the national and/or regional/local governments of the countries in which they are located.



Source: Barnes et al (2016b:47)

The basic investment (and associated production) narrative that emerges from a review of competing automotive producing economies appears to largely follow four stages:

1. **Attracting** an initial OEM investment that is sufficiently meaningful to build a centre of gravity for a future automotive industry. This investment is generally very heavily incentivised, e.g. Morocco, Thailand, and Turkey.
2. **Securing** the initial OEM investment, by following through on the establishment of required skills, bulk infrastructure supply and required support institutions. Key to this stage is proving the competitiveness of the initial investment made, thereby encouraging production for markets beyond the confines of the domestic market, e.g. Morocco, Thailand and Turkey.
3. **Deepening** OEM investments, either through the expansion of the initial investment, and/or the attraction of additional OEM investments. This stage represents the development of an actual automotive industry, as opposed to simply an incentive-induced anchor investment or set of investments. Morocco appears to be starting this phase, while Thailand and Turkey have already moved through this phase. This appears to be the phase in which the Malaysian automotive industry has been ‘trapped’. Its highly protected market (until recently) enabled

the development of an uncompetitive national automotive industry that was never able to develop deep capabilities, with both national OEM ‘champions’ (Proton and Perodua) manufacturing globally uncompetitive products. This also appears to be the position that South Africa is trapped in, although it is arguably for the exact opposite reason than observed for Malaysia. In South Africa’s case, it would appear as if market depth has been an insufficient driver for industry development. This has placed too much importance on the development of deeper dynamic capabilities.

4. **Developing** the automotive component manufacturing supply chains behind OEM investments (and broader value chain services), and hence value adding activities within the broader automotive industry. This represents the stage where an advanced automotive ecosystem develops, with the commensurate economic multipliers that automotive production can bring to a local (and broader national) economy. Thailand and Turkey appear to have progressed the most in relation to the development of this type of ecosystem.

Interestingly, Australia had an advanced (albeit high cost) automotive production ecosystem and chose to exit the industry. Tariffs were reduced to very low levels leading to the closure of the last light vehicle assembly plant in 2017. A small number of export-based component suppliers remain, and their future remains tenuous. Automotive policy globally (at least among the economies selected for analysis) appears to be sensitive to the stages of development of the automotive industries in the economies concerned. Attracting an OEM in the initial stages of the development of an automotive industry requires a clear market rationale (domestic or regional market opportunity), while the nature of policy shifts quite significantly when considering more established developing economy automotive industries that are looking to move up the value chain and develop their competitive capabilities.

The support provided to the Thai and Turkish automotive industries are, we believe, the most important to note in this regard:

1. Substantial support for greenfield and brownfield plant investment, with this support taking the form of generous corporate income tax benefits based on the quantum of the investment made, or over a defined timeframe.
2. Substantial support for asset-enabling activities, with this taking the form of incentives for training/skills development, industrialisation (testing), R&D, and industry-specific infrastructure.
3. Alignment of domestic market taxation and regulatory requirements with local production capabilities and specialisation; e.g. Turkey’s requirement that OEMs invest in dealership networks before being able to sell even small CBU volumes in the domestic market; and Thailand’s domestic market tax structure that effectively ensures a market bias for LCV derivatives and small cars (Barnes et al, 2017).
4. Coordinated upgrading support for the automotive industry (e.g. via the Thailand Automotive Institute in Thailand), often working in close collaboration with selected anchor OEM and component manufacturing investors.

Interestingly, in the case of Thailand and Turkey, government support appears to be less focused on attracting investments from entirely new industry players, and more focused on deepening existing automotive activities, particularly in those areas that government (working in collaboration with industry) has identified as strategically important to supporting sustainable industry development. In the case of Thailand, this support has clearly been driven by an Automotive

Masterplan (which Malaysia appears to have recently mimicked through its establishment of a National Automotive Plan), while in the case of Turkey, support has been framed by the increasing skills and technology base of the local industry, hence the support for R&D and technologically advanced infrastructure. In all three cases (Thailand, Turkey and now Malaysia), there is also a clear focus on deepening capabilities in areas of product specialisation (Thailand is focusing on LCVs and now eco cars; Turkey on LDVs and M&HCVs; and Malaysia on EEVs). These cases contrast with Morocco, which is still focused on securing its new automotive industry. Support in Morocco appears to have been targeted at mitigating investment risk by providing advanced automotive infrastructure and large-scale skills development support for investors, alongside substantial grant support and the attraction of additional OEM and Tier 1 investments to create a functioning automotive ecosystem upon which further deepening and developing support can then be provided.

Interestingly, with the sole exception of Australia, none of the economies reviewed offer the automotive industry operating incentives tied to production output or have duty rebate mechanisms tied to defined production levels. Support appears to be concentrated on protecting domestic markets, securing preferential market access to large, developed economies or regional markets, alongside significant corporate income tax-based investment support and generous subsidies for capability development.

The comparative market depth and access protection for a range of selected economies is presented in Table 7, alongside South Africa's comparative position and performance. South Africa has a lot to learn from many of the economies, which have grown more rapidly, and have larger and more highly protected domestic markets, as well as access to major regional/international market opportunities. South Africa has a limited light vehicle market relative to its major competitors. And while South Africa has preferential trade access to major developed economy markets, these markets are distant, ensuring that countries such as Slovakia, Turkey and Morocco have a substantial comparative advantage over South Africa, particularly when supplying into the large EU market. While the South African market is reasonably protected relative to comparator economies, it is important to note that domestic CBU tariffs can be rebated to zero, resulting in minimal protection for the domestic market, hence the dual score of 3/1 in Table 7. South Africa's comparative incentive support rating is high, with its VAA, PI and AIS contributing to a rating of 4. This level is shared with Malaysia, Morocco, Thailand, and Turkey.

Table 7: Comparative market access and production dynamism of 12 selected economies and South Africa

	LV market (2015)	Major PTA advantages	Market depth rating*	PV CBU duty	LCV CBU duty	Market protection rating*	Incentive support rating*	Production (2015)	Production CAGR 2011-5	Growth rating*
India	3,425,336	GCC; ASEAN	5	100%	35%	5	2	3,805,237	1.2%	1
Brazil	2,568,976	MERCOSUR	5	35%	35%	4	2	2,333,903	(8.1%)	1
Mexico	1,351,648	NAFTA	4	50%	50%	4	3	3,387,522	7.4%	4
Australia	1,155,408	ASEAN; USA	3	5%	5%	1	1	167,538	(6.3%)	1
Turkey	1,011,194	EU, MENA	3	10%	22%	2	4	1,307,038	3.4%	2
Thailand	797,579	ASEAN	3	80%	40%	4	4	1,888,130	7.1%	4

Malaysia	666,674	ASEAN	3	30%	30%	3	4	610,694	3.6%	2
S. Africa	587,214	EU; AGOA	3	25%	25%	3/1	4	583,999	3.7%	2
Egypt	332,100	GAFTA; EU	2	40%	135%	5	3	12,000	(18.5%)	1
Morocco	131,910	EU, GAFTA; US	1	25%	25%	3	4	288,329	48.4%	5
Slovakia	90,091	EU	1	10%	22%	2	3	1,000,001	11.8%	4
Nigeria	26,400	AGOA	1	70%	35%	5	1	0	0%	1
Kenya	14,100	AGOA	1	25%	25%	3	1	0	(100%)	1

Source: Barnes, Black, Comrie and Hartogh (2016b:49)

* Rating: 5=very high, 4=high, 3=average, 2=low, 1=very low

Other economies that score lower incentive ratings are typically far more aggressive in protecting their domestic markets. Examples include India (CBU tariffs ranging from 35% to 100%), Egypt (CBU tariffs of 40% to 135%), and Brazil (35% CBU tariff). This also appears to be the strategy Nigeria has chosen to follow (35-70% CBU duties), although its policy is undermined by the continued importation of pre-owned vehicles. While South African automotive production has fared better than several comparator economies, most notably India and Brazil, its performance over the period 2011 to 2015 has paled relative to Mexico, Morocco, Thailand, and Slovakia (all with average growth above 7% per annum).

5. Determinants and constraints to structural change: bargaining and ownership

Institutional dynamics and the political economy context in which policies are formulated strongly affect developmental outcomes. The historical trajectory a country follows determines policy and the balance of forces between the actors involved in designing them. South Africa's industrial development path has been highly conditioned by its apartheid legacy, and the way the globalisation of its economy was negotiated also depended on this inheritance. The auto industry, in this sense, followed a rather peculiar path. First, it benefited from significant financial support received in the form of incentives – which other industrial sectors were not granted. Second, its development was also influenced by global integration being delayed by the sanctions period, although the eventual integration into international markets was quite rapid. Finally, the sector, being one of the most globalised, was also one of the most exposed to the demands of multinational firms, and to power bargaining dynamics between local institutions and foreign firms (Masondo, 2018). The way state–business bargaining affected the policy space in the auto industry is discussed below. The impact of changing ownership is also analysed. In this regard, both positive effects and negative implications are highlighted.

5.1. State - business bargaining and the role of multinational firms

Since the end of apartheid, and of the white nationalist project that found its expression in the protection of infant industries, the South African state was caught between forces pushing in different directions. On one side, the need to transform the socio-political-economic structure in a democratic sense, called for a developmental project addressing the basic needs of a long-neglected majority population. On the other, the wish to catch up with the rest of the world, to

compensate for 'wasted' time, resulted in an attempt to accelerate global integration. Indeed, all this affected the industrialisation process.

Tangri and Southall (2008) highlight how the co-existence of contrasting goals generated a tension often difficult to manage. In this sense, the post 1994 ANC governments all clumsily steered between declared aims to pursue economic equity and redistribute wealth, and express advocacy of actions targeting rapid economic growth by attracting corporate investment.

Hamann, Khagram and Rohan (2008) discuss how the apparent attempt to establish a form of 'collaborative governance' between state and business paradoxically entailed an active intervention of the state to limit its own powers. In their view, any move to regulate firms' behaviour was always constrained by the need to operate within a framework that worked for them. In practice, what lay behind the negotiation of a governance space was always the condition for business to keep a hegemonic position. This was particularly evident in the auto industry, where global companies not only asserted their voice in relation to investment and productive strategies, but also defended a dominant role within the supply chain (Barnes et al, 2017).

With parallels to the Slovakian case described by Pavlinek (2016), in the development of the South African auto sector, the state played a crucial role in accommodating the strategic needs of foreign capital, to a point where the industry became overwhelmingly dependent on the directions taken by global investors (Hamann, Khagram and Rohan, 2008). Analysing an FDI-driven, export-oriented strategy comparable to the one pursued by the South African auto industry in the post-apartheid era, Pavlinek (2016) usefully warns against dynamics typical of a 'dependent market economy', where the state actively sets the rules of the game to attract investors, but eventually sees its bargaining power significantly reduced. In this regard, while broadly compensating for the lack of domestic capital, strategies relying on foreign capital as a primary vehicle to promote national competitiveness and industrial restructuring end up dramatically limiting the internal policy space. At the sectoral level, such strategies will be successful only if the shape taken by the targeted industry is in line with the investment strategies of the hosted MNCs. Overall, while possibly conducive to faster integration and more efficient restructuring, such policies can also be less sustainable as they are extremely reliant on state incentives and can lead to patterns of uneven development. For example, as in the South African case, they can lead to the progressive erosion of local capabilities, whereby "*export-oriented foreign-owned factories often assemble high-tech, high quality goods with a relatively high value-added from components that are either imported or produced locally by other foreign firms*" (Pavlinek, 2016:575). The outcome of such strategies can be rapid industrial growth, but with the possible downside of truncated supply chains, foreign capital control and reduced state bargaining power.

5.2. Changing ownership and its impact

In the South African case, state-business bargaining dynamics negatively impacted the development of the auto sector: while foreign investment promoted industrial upgrading and international integration, local ownership and capabilities simultaneously declined (Barnes et al, 2017; Masondo, 2018).

As indicated previously in the early 1990s, levels of foreign ownership were quite low both among vehicle manufacturers and component producers. This changed in 1994 with the country's reacceptance back into the international community. The globalisation of the industry manifested in growing exports and imports had major implications for ownership. It became increasingly important for local firms to have links to global networks as a way of facilitating access to international markets. In South Africa, and indeed in other emerging markets, foreign owned assemblers increasingly preferred to source components from joint ventures and wholly owned subsidiaries rather than domestically owned firms. The result for many South African firms was that they either needed to seek out an international partner or faced the prospect of being confined to the aftermarket (Barnes and Kaplinsky, 2000).

With growing foreign ownership, the main conduits for technological upgrading were through transfers from foreign sources rather than an increase in domestic R&D. Domestic firms, under pressure to upgrade their technological and production capacities, turned to foreign sources through the establishment of joint ventures, for example. There is plenty of evidence that when local firms have come under the control of transnationals, existing R&D establishments are downsized or shut down (Black, 2011). It does not follow, however, that these firms downgrade technologically because the shutting down of formal R&D facilities can be accompanied by the introduction of new specialised product and process technologies which bring host firms closer to the world frontier.

Car-makers have actively sought out component suppliers who are able to export and to supply components which meet the exacting standards of their own increasingly export oriented assembly operations. Multinational car firms have therefore played a major role as conduits between domestic component firms and the international market by arranging export contracts for component suppliers by facilitating access to their global networks, brokering new investment, bringing in new technology and accelerating the transfer of industry best practices in production organisation to their suppliers.

There is no doubt that foreign ownership, as opposed to licensing arrangements, has in many cases been critical for vehicle producers to obtain major export contracts but the question is more complicated for component producers. A number of foreign owned suppliers have established facilities in South Africa with the sole purpose of supplying component subsystems to domestic assemblers. A striking difference between foreign owned and domestically owned firms has been that the former import a significantly larger share of their requirements. The main explanation is that many foreign component firms are 'systems integrators', supplying entire sub-assemblies to the vehicle manufacturer. This is more of an assembly than a manufacturing activity. Foreign firms are also clearly less embedded in the domestic economy although this may change over time as firms develop domestic linkages (Black, 2011).

6. Major challenges: localisation and supply chain development

The production of the thousands of components, which make up a vehicle, comprise the heart of the industry. All host governments seek to promote greater levels of localisation of parts production. These efforts, as already indicated, have a long history in South Africa. The recently announced South African Automotive Masterplan (SAAM) sets ambitious targets in this respect, aiming to raise local content to 60%. This section analyses the strengths and weaknesses of the supply chain and assesses the prospects for achieving SAAM targets. It then assesses several upgrading initiatives before investigating the prospects of BEE policies and black ownership in the sector. These latter sections draw on recent fieldwork conducted with stakeholders involved in implementing and monitoring upgrading and transformational policies and programmes.

6.1. Analysis of the supply chain

The South African automotive value chain is underdeveloped relative to leading international competitors, with this evident in the low and deteriorating local content levels in South African assembled vehicles, and the substantial volume of components imported by the domestic industry. Table 8 indicates the extent of this trend over the period of the APDP. While South Africa increased the value of its vehicle assembly activities significantly over the period 2012 to 2015 (from R75 billion in manufacturing sales to R137 billion), this increase was accompanied by a R44 billion surge in automotive component imports over the same period, largely nullifying the large assembly gains made.

Table 8: South African OEM manufacturing sales and associated import and local content values (Rand billions)

Year	Vehicles	Local content	Imported content	Local content (%)
2012	R 75.3	R 35.2	R 40.1	46.6%
2013	R 92.5	R 37.9	R 54.6	40.9%
2014	R 113.5	R 47.1	R 66.4	41.5%
2015	R 136.7	R 52.9	R 83.8	38.7%
2012-15 % change	81.5%	50.3%	109%	-17.0%

Source: SARS (2012-2015)

One of the major supply chain challenges confronting the South African automotive industry is its production/assembly of largely commodity products that constitute declining shares of automotive value addition, e.g. metal pressings and plastic moulded products, as opposed to electronics, powertrain, telematics, and advanced safety products. Strikingly, the South African automotive components supply base feeding domestic OEMs has a similar profile to the now defunct Australian automotive components industry – a major challenge that was identified in the Australian National Productivity Commission report that led to the Australian Federal Government refusing to provide additional assistance to the industry, and forcing its closure (Productivity Commission, 2013). It was noted in that report that

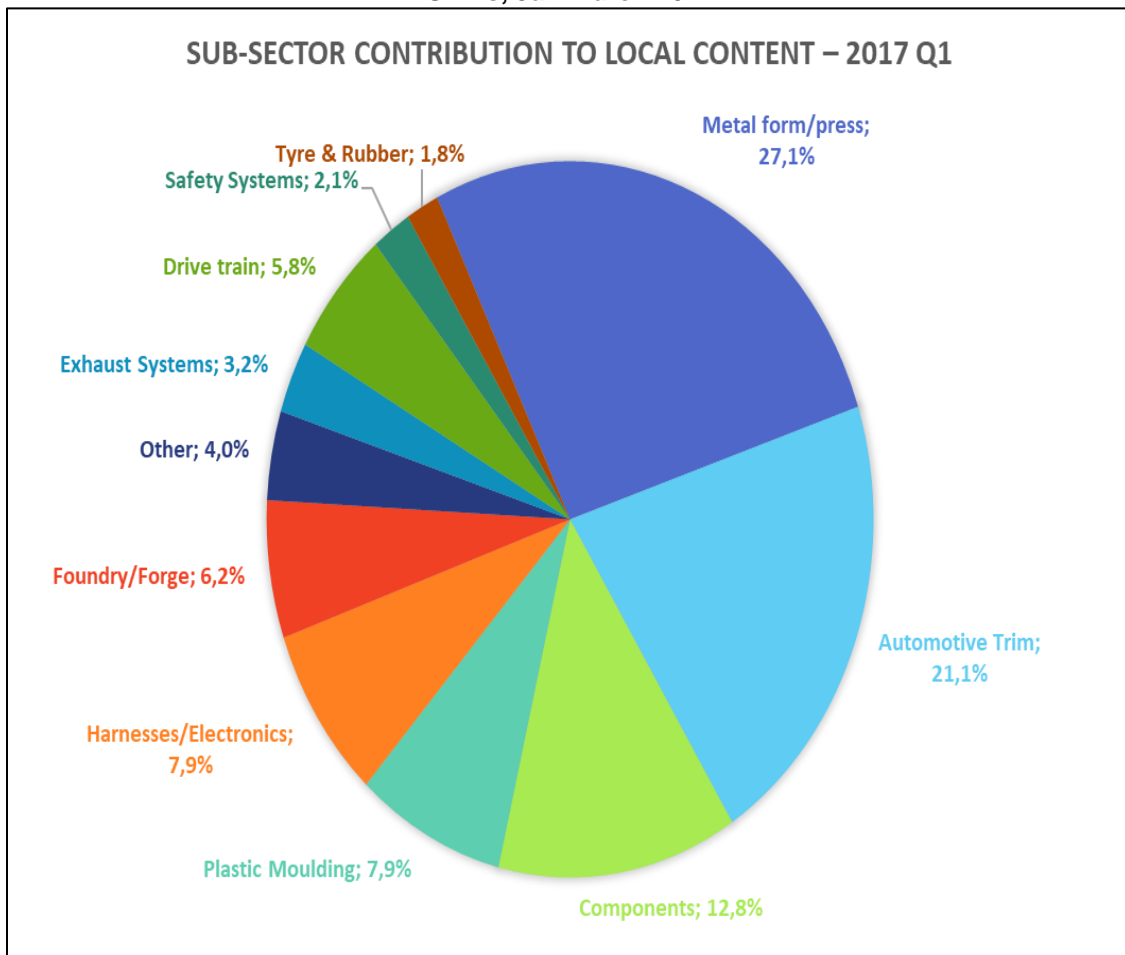
“...in the decade to 2010, Toyota added new components and subsystems worth \$1400 to its base model Camry, while the Camry’s recommended retail price in the United States fell by an average of 1 per cent each year in real terms over the same period”.

In the same study it is was further observed that

“...between 2001-10, producers in the United States were required to spend an additional \$400 per vehicle on components to satisfy increased safety standard” (Productivity Commission, 2013: 49).

The consequences of these trends for an automotive components industry that largely sub-assemble for OEMs, along with the production of metal fabrications, metal pressings, plastic mouldings, and glass and tyres, are potentially substantial. And as indicated in Figure 5 this is the exact profile of local content feeding into six of South Africa’s seven OEMs. A full 27% of local content is derived from metal pressing activities, with a further 21% from automotive trim (which is itself largely a sub-assembly activity), 13% from discrete components (windscreens, filters, etc.) and 8% each from plastic moulding and harness/electronics assembly. There is very limited powertrain and no telematics production in South Africa.

Figure 5: Breakdown of local content within component supply to six of South Africa’s seven OEMs, Jan-March 2017



Source: BMA Intelligent Systems (APDP Administration System), data for Quarter 1, 2017

6.1.1. Component Exports

As indicated in Table 9, component exports have expanded dramatically. From a low base of R3.3 billion in 1995, component exports increased to R23 billion in 2005 and R49.6 billion by 2015. A key objective of the import-export complementation scheme under the MIDP was to assist component suppliers to generate high volumes which would make them more efficient, and able to compete in the domestic market against imports. A linked objective is that reduced production costs would have the added benefit of providing lower cost inputs into the assembly industry. The objective of higher component volumes has certainly been achieved at least in the sense that export development has usually been accompanied by higher volumes and specialisation. Many component producers have rationalised their product lines.

Table 9: Major component export categories, 1995-2015 (R million)

	1995	2005	2012	2015	% 2015 total
Total	3,316	23,000	36,867	49,641	100.0
Catalytic converters	389	9,935	16,347	20,326	40.9
Engine parts	102	1,000	2,875	3,941	7.9
Tyres	213	1,183	1,522	2,193	4.4
Automotive tooling	153	332	782	1,459	2.9
Engines	9	781	559	1,448	2.9
Radiators and parts	66	220	945	1,190	2.4
Transmission shafts/cranks	55	553	771	1,060	2.1
Stitched leather seat parts	1,019	2,693	1,719	993	2.0
Other	1,077	5,073	9,151	17,031	34.3

Source: AIEC (various years)

The nature of export expansion raises two concerns from a government perspective. Firstly, there is the issue of the implications for the overall integration of the industry, particularly given the profile of products, which are being exported. Secondly, there is the question of the sustainability of the rapid export expansion that has taken place. Ideally component exports would allow for economies of scale to be realised in the production of parts being supplied to South African OEMs. But as illustrated below, the bulk of component exports did little to achieve this. The most striking development was the huge growth in the export of catalytic converters (see Table 9), which benefitted from generous export subsidies. The inclusion of raw materials (in this case, platinum group metals) in the benefit calculation boosted the value of the subsidy and made catalytic converters the component of choice for vehicle producers wanting to offset import duties. The result was a surge of investment into the sector to the growing dismay of NAACAM, which constantly lobbied for a reduction in support to this sub-sector. This conflict led to the catalytic converter producers establishing their own business federation, the Catalytic Converter Interest Group (CCIG), which worked closely with NAAMSA and lobbied to maintain support. Government

has long been aware of the problem and embarked on measures to reduce the subsidy in the early 2000s.

The DTI has battled to ensure that the large (subsidised) investments in this sub-sector are sustainable. Even though the catalytic converter industry is capital intensive, this is in part due to its high working capital requirements tied to value of platinum group metals (PGMs), which are integral to the production process. Early investments in the sector gave the impression of it being footloose, with only limited segments of the total production process carried out in South Africa. Initial investment involved the establishment of plants, which undertook the coating and canning of the imported ceramic substrate. The pace of expansion increased following the signing of several very large contracts from 1999 to 2000 and by 2005 South Africa was producing approximately 14% of total world supply. The industry has reached sufficient critical mass to justify backward integration beyond the relatively simple coating and canning processes and the two world leaders in ceramic substrates, Corning and NGK Insulators, established plants in South Africa that undertake the cutting and baking of the substrate (but not its manufacture). While there has been investment in ancillary industries such as connectors, insulating mats, exhaust systems, and silencer assemblies, the firms have not made the very large investments required for substrate production.

Another example of a large export sub-sector that emerged under the MIDP's export subsidies is automotive leather. This is a labour-intensive process and shares some of the attributes of the notoriously footloose garment industry. In this sector too, the value chain became increasingly embedded with the development of world class capabilities ranging from the tanning of high quality leather to JIT logistics. But while current exports remain substantial, they have declined from R3.1bn in 2008 to R993 million in 2015. This is due to several factors. BMW and Mercedes Benz have moved contracts to central Europe even though the tanneries there also source a proportion of their automotive wet blue grade hides from South Africa.¹⁹ Automotive policy issues have played a role. When the MIDP first came under scrutiny as a potentially actionable export subsidy under the WTO, it was the Australian government, under pressure from their domestic producers of automotive leather, that first threatened to challenge the policy. While the APDP only came into effect in 2013, its basic parameters were clear some years earlier and affected investment decision making, leading vehicle producers to diversify away from South Africa as a source of leather supply. Under the APDP, vehicle and component producers earn production credits but highly export oriented sectors of the component industry had support levels substantially diminished even though they were included in the category of 'vulnerable industries'. Two large factories relocated operations to Lesotho where labour costs are significantly lower.

Major export categories such as catalytic converters, silencers/exhausts and stitched leather seat parts could be described as 'peripheral' in the sense of being relatively minor components, which have high raw material content and are not particularly complex in terms of incorporating large numbers of sub-components.²⁰ The bulk of export expansion has, therefore, not been by

¹⁹ Interviews.

²⁰ The visiting chief executive of a major carmaker referred disparagingly to them as "salami".

'traditional' component suppliers but by a rapidly emerging new group of mainly foreign owned firms frequently with links to vehicle manufacturers.²¹ The outcome has been relatively light investments with a low level of integration into the domestic industry, either in terms of supply to domestic vehicles or in terms of the use of sub-components. Because exports account for the vast share of output in most of these cases, domestic consumers (either assemblers, first tier suppliers or the aftermarket) do not receive the benefit of reduced costs due to economies of scale. It could be argued, therefore, that local assemblers in conjunction with their multinational parents have developed large component export businesses, which do not contribute much towards the more integrated development of the automotive industry. Exports served the need of multinationals to secure import credits, rather than the deepening of production capabilities within OEM supply chains, which was the stated aim of the government policy.

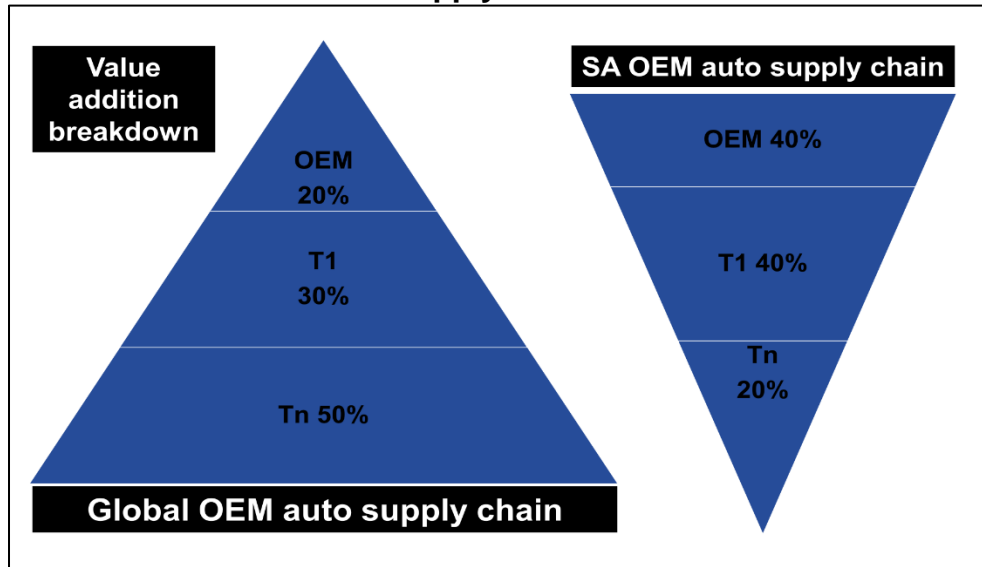
6.2. The underdevelopment of the supply chain

The reasons for the underdevelopment of the South African automotive supply chain are multi-fold. The legacy of a weight-based local content programme that lasted from 1961 to 1989 is clearly one factor, but so is the way vehicle assembly evolved in alignment with government policy changes. By strongly incentivising CBU and component exports and aggressively reducing component import duties, the MIDP exposed component firms to substantial international competition, slowly eroding the high levels of local content in South African vehicles in the mid-1990s (estimated at around 60%), and eventually displacing large, South African-owned automotive component manufacturers, such as Dorbyl, Murray and Roberts, Kolbenco, and T&N Holdings. Further up the supply chain, major South African materials suppliers such as Iscor were sold to multinational firms with limited interest in, or exposure to automotive markets, resulting in poor service to South African OEMs and component suppliers with a long tradition of buying from them. As technology advanced, local OEMs and component firms were forced to import key materials, such as specific grades of metal, resulting in substantially reduced local purchasing.

The consequence is that the South African automotive value chain has a very different profile to that of the global automotive industry. This is depicted conceptually in Figure 6. As highlighted, while OEM activity globally is typically only responsible for 20% of total value addition, with 30% at the Tier 1 components supplier level and 50% further upstream; the value addition position in South Africa is estimated at 40% for OEMs, 40% for Tier 1 component firms and only 20% further upstream. Rather than operating as the bedrock for broader industrialisation within the South African economy, the present profile of the automotive supply chain suggests it is increasingly becoming an island, with only a narrow isthmus connecting OEM and Tier 1 activity to the rest of the economy.

²¹ Similar trends have been observed in other countries experiencing rapid international integration and export expansion, e.g. Argentina (Miozzo, 2000).

Figure 6: Value addition breakdown of global and South African automotive supply chains



Source: Barnes (2014)

6.3. Technological capabilities

Technological capabilities within the South African automotive supply chain are limited. While pockets of advanced automotive product capability existed up until the early 2000s, largely as a residual output of apartheid South Africa's military industrial complex, these capabilities have largely been displaced over the last decade by superior multinational technologies. For example, M&HCV engine and transmission production terminated with the conversion of Atlantis Diesel Engines to a foundry manufacturer, and the closure of Astas, respectively, while pockets of advanced electronics capability have largely converted to electronics assembly under license to multinational corporations. These trends are documented in Lorentzen and Barnes (2004), with more recent benchmarking data from the SAABC indicating continued limited R&D expenditure in the industry (well below 1.5% of manufacturing sales per annum for each of the last 15 years for benchmarked firms). The industry has become a technology colony – one capable of introducing and industrialising selected multinational technologies, but largely incapable of contributing to processes of global innovation.

6.4. Localisation, BBBEE transformation and supply chain development

Sustainably growing vehicle production is one key facet of the development challenge facing the South African automotive industry. An equally important, and associated, challenge is the deepening of local content. At only 38.7% local content in South African assembled vehicles in 2015, the ability of the South African automotive industry to realise its growth potential is likely to be severely compromised. As a second-tier automotive producer, the domestic automotive industry has the potential to grow its local content to at least 60%. This is based on the recognition that core drivetrain, powertrain, safety and telematics technology is unlikely to be domestically sourced soon, but that there is substantial opportunity to increase local content in South African vehicles – as evidenced through the experiences of other second tier automotive economies, such as Turkey, Thailand and Brazil.

Localisation is a multi-dimensional challenge requiring a multifaceted response. At the most basic level it is associated with improving South Africa's factor cost profile (overheads, labour, and materials costs), along with the economy's ability to ensure technology and skills availability ahead of industry demand. However, improvements across these factors simply represent a necessary, but insufficient condition for the deepening of local content within the South African automotive industry. Research completed for the South African Automotive Masterplan in 2016 emphasised the debilitating impact of exorbitant logistics costs, government-administered service price increases (electricity, water, waste removal, rates, etc.) on the operating costs of firms. As firms have shifted their business models to accommodate these increasing costs, critical local content has been lost, along with associated technologies and skills. Reversing this trend requires the stabilisation of government-administered service costs, and the development of technology and associated skills as firms look to deepen their own value addition, or to source components/materials locally, instead of from competitive foreign sources. This base capability building should improve the general position of the South African automotive value chain and create the preconditions that are likely to encourage the deepening of local content.

Additional key elements relate to the creation of targeted specialisation within the automotive value chain, and the potential to strategically link South Africa's materials base with automotive opportunities. Dealing with specialisation first; unless firms can secure economies of scale within the domestic automotive industry, they are unlikely to be sufficiently competitive to deepen their value addition. Key then is identifying opportunities to secure improved economies of scale in the context of South Africa's comparatively small production volumes. This is partly a policy issue, but it also requires industry coordination and programmatic interventions. The South African automotive industry, working in partnership with national government, has established the Automotive Supply Chain Competitiveness Initiative (ASCCI) as the vehicle for identifying and responding to localisation opportunities (see section 6.5.3), and it is critical that the industry and government collaborate on specific agreed-upon opportunities, especially where local materials availability provides the scope for substantially improving local content through South African automotive supply chains, and establishing potential areas of specialisation for the domestic industry within complex Global Value Chains (GVCs).

The objective of increasing local content is deeply intertwined with the challenge of promoting the transformation of the industry. Part of a broader ambition to strengthen local ownership of the country's productive assets, and to promote the participation of black industrialists in the development of a national industry, such goals have received increasing attention. The transformation of the sector is consequently included amongst the top priorities of firms looking to continue securing government support, and to access available incentives. However, the process appears very slow; transformation targets have been achieved to a very limited extent, and policies in place, already under revision, have revealed significant weaknesses.

The idea of economic transformation, aimed at expanding the role of black ownership and control of the economy, became part of the post-apartheid political project at its outset. The concept of black economic empowerment (BEE) was formulated in the 1990s, leading to the establishment

of a BEE Commission led by South Africa's new president, Cyril Ramaphosa (Hamann et al, 2008). Since 1994, the aim of achieving BEE has informed numerous government programmes. Overall, the BEE policies of the first 10 years of the post-apartheid era were, at best, considered ineffective, leading to only cosmetic adjustments of pre-1994 inequalities and economic imbalances. Early BEE policies were also strongly criticised, for resulting in the formation of a black industrial élite, without concretely addressing South Africa's much deeper structural disparities. Makgetla (2004), for example, highlighted how economic restructuring post-1994 created very limited opportunities for black entrepreneurs, while the extreme concentration of ownership remained largely unchanged. Only a minority of well-educated black individuals managed to penetrate industrial élites by accessing the incentives offered by the state. At a firm level, 'black economic empowerment' seems to have meant increasing support to medium/large black companies, rather than an actual challenge to existing monopolies and associated concentration of economic power. To some extent, especially in the first phase of BEE policies, foreign capital was largely exempted from following BEE rules (Freund, 2007).

The perception of limited policy reach (Ponte, Roberts, van Sittert, 2007) led the South African state to reconsider the first package of BEE policies, in favour of an enlarged set of conditions for transformation. The 2000s thus saw the introduction of a 'broad-based black economic empowerment' (BBBEE) formula, which went beyond simple corporate ownership. The widened package entailed a long list of criteria, seen as crucial indicators of deeper transformation. These included ownership, management representation, employment equity, skills development, preferential procurement, enterprise development and corporate social investment (Ponte, Roberts, van Sittert, 2007). The objective was to promote more inclusive transformation, and to target a larger pool of potential beneficiaries. However, despite the revision of the original agenda, and the ambition to extend its reach, the implementation of BBBEE policies remained limited, and the transformation of South African industry remained slow. Several weaknesses have been identified. Ponte, Roberts and van Sittert (2007) warned against the managerialisation of the BEE agenda, which progressively shifted towards technical compliance, moving away from its initial focus on redistribution. In turn, this implied the incorporation of political objectives within a market-driven logic, more concerned with securing investment than with reversing economic inequalities. Ultimately, such processes also transferred responsibilities from the state to the firms; with firms competing to tick boxes on their scorecards to win incentives. Overall, the reduction of the BEE agenda to a technical exercise eroded the developmental role of the state, and reduced state-capital bargaining to a merely mechanical assessment.

Despite critiques of its implementation and limited achievements, the idea of black economic empowerment remains crucial for the transformation of SA's post-apartheid economic system. In this sense, and as will be discussed in the next section regarding current auto policies and existing sector initiatives, transformation and localisation are clearly complementary priorities. However, progress will not be achieved only by setting the right policy targets, but necessarily through the joint efforts of all the stakeholders involved in sustainably expanding the industry.

6.5. Existing initiatives²²

While the pressure towards transformation, localisation and supply chain development seems to have increased in the last few years, and there is a recorded willingness on behalf of government to enforce BBEEE compliance as an important condition for receiving state support, much still clearly needs to be done. Progress remains slow, and the coordination between different initiatives needs to be significantly improved; moreover, the uneven balance of forces between different stakeholders operating in the auto industry often constrains the policy space. This section builds on the interaction with different stakeholders, namely NAAMSA, NAACAM, the Automotive Supply Chain Competitiveness Initiative (ASCCI), the Automotive Industry Development Centre (AIDC), and the Durban Automotive Cluster (DAC). It maps the initiatives currently in place, reports on the main challenges identified by stakeholders, and attempts to providing an overall assessment of potential strengths and weaknesses, which need to be considered in light of the 2035 Masterplan.

6.5.1. NAAMSA²³

Government pressure to transform the sector has impacted on NAAMSA, and the federation is currently running several initiatives in this regard. A concerted effort to localise seems to be in place, whereby the OEMs Purchasing Council is currently engaged in consultations aimed at identifying seven key components with localisation potential. For such purposes, the Council has recently nominated John Astbury, former Vice President of Global Purchasing at GMSA, to act as a facilitator/coordinator, in charge of managing discussions between OEMs and conducting feasibility studies of the different localisation options.

In addition, NAAMSA is also considering the adoption of the black industrialists fund, equity equivalent models, and a proper transformation fund. At the same time, there are ongoing discussions on the possible establishment of a black manager fund. Overall, NAAMSA reports an increasing willingness to comply with localisation and transformation requirements, but also of significant challenges. With regard to the BBEE scorecard, some objectives are simply too costly. For example, the achievement of the expected ownership threshold through the adoption of an equity equivalent, in such a capital intensive sector, is estimated at over R12 billion. In terms of preferential procurement, NAAMSA is also concerned about the lack of cost-competitive black suppliers that would help reach the expected level 4 of the BBEE scorecard.

Looking at the future, NAAMSA underlines the need for localisation of the lower tiers of the chain, where a large portion of value is produced. In relation to the desired increase in local content, as per the 60% target set in the 2035 Masterplan, they see the localisation of high value added components, like engines or gear-boxes, as being particularly difficult in the absence of large volumes. However, they suggest the exploration of new niches – like the local production of batteries for electric vehicles launched by other producer countries. Overall, NAAMSA advocates a coordinated and concerted policy effort, one prioritising localisation and transformation targets

²² This section draws on fieldwork interviews conducted by Monaco with the DTI, AIDC, ASCCI, NAACAM, NAAMSA, and the DAC.

²³ This section draws on interviews with NAAMSA (February, 2018).

but also acknowledging the centrality of OEMs business strategies for the sustainability of the industry as a whole.

6.5.2. NAACAM²⁴

From a component suppliers' perspective, NAACAM acknowledges the urgency and importance of transforming the industry. Claiming the need to take a proactive approach in response to more stringent government requirements, and to overcome policy inefficiencies encountered so far, NAACAM is currently engaged in several initiatives. Firstly, recognising the lack of a comprehensive map of BBBEE compliance amongst suppliers, a survey of BBBEE performance has recently been conducted amongst NAACAM members (NAACAM, 2018). The survey followed the 2013 Amended Codes of Good Practice (that came into effect on 1 May 2015), focusing on ownership, skills development, and enterprise and supplier development as three priority elements, plus management control and socio-economic development. Unfortunately, survey results revealed an unsatisfactory picture, with less than 26% of NAACAM respondents being fully compliant with the BBBEE scorecard. Firms scored better in terms of skills and supplier development, but poorly in terms of ownership and management control. Since the scorecard system sets ownership as the key priority, the status of the whole sector is downgraded to non-compliant. Overall, while some technical difficulties emerge (like firms not submitting the correct certificates or not being aware of how to compile the required documentation), the survey indicated slow supplier progress towards BBBEE transformation. To improve the status of the sector, NAACAM (2018) has recommended promoting increased black ownership via a proposed transformation equity fund. In addition it is recommending that large companies outsource part of their businesses to small black owned firms, and that firms improve their training programmes and recruit more black graduates into managerial positions.

NAACAM is presently engaged in three programmes that are aimed at equipping members with a sort of 'toolbox' for transformation. The first is 'best practice education': here NAACAM employs service providers to run workshops on the 2013 Codes of Good Practice for manufacturing companies. Such seminars are intended to help suppliers develop a commercially viable strategy to comply with transformation requirements. These workshops are directly addressed to CEOs, CFOs and plant managers. The second area of intervention concerns black supplier development programmes. In this regard, NAACAM works jointly with ASCCI, of which it is a founding member. Once a company has been identified as being interested in localising a certain component and willing to sponsor the development of a black supplier, NAACAM works with ASCCI to help the supplier go through an 18-month upgrading and qualification programme. The third, and most crucial area, relates to the ownership element. NAACAM has been working to develop an accounting and financial transaction template, representing a legal model that suppliers can use for equity transactions when partnering with black owned suppliers. NAACAM is attempting to provide legal assistance to suppliers to ensure compliance with BBBEE criteria, while also working with black fund managers and black investors that companies could potentially partner with.

²⁴ This section draws on interviews with NAACAM (November, 2017 and February, 2018).

6.5.3. Automotive Supply Chain Competitiveness Initiative (ASCCI)²⁵

Born as a partnership between four key industry stakeholders (NAAMSA, NAACAM, DTI and NUMSA), ASCCI was established in 2013 with the specific task of setting a strategic direction for supply chain development in the South African auto industry. It was designed as a public-private initiative to respond to the perceived lack of a strategy to bring together the different initiatives and the dispersed resources available to the auto industry. ASCCI operates on the basis of three-year business plans, comprising the alignment of existing activities with government policy directions and the implementation of its own projects using externally raised funds. It is presently implementing its second three-year plan.

The activities run by ASCCI focus on three main pillars, 1) supplier capability, 2) localisation, and 3) strategic insights. The first involves interventions aimed at enhancing SA supplier competitiveness levels, comprising value chain competitiveness upgrading, shop floor improvements, black supplier development and skills development. For localisation (pillar 2), activities focus on raw materials beneficiation, localisation of tier 1 and 2 firms, and the connection of tier 1 and 2 suppliers with available localisation opportunities. The third pillar gathers all research-type activities on industry trends, international benchmarking, etc. and considers their impact on the South African automotive industry.

Since its inception, ASCCI's activities have progressively shifted from a predominant focus on supplier development to the broader inclusion of objectives related to localisation and transformation. Within each pillar, strategies and targets are also being reconsidered, with the second three-year business plan targeting the upgrading of entire value chains, rather than isolated suppliers. In addition, the second business plan seeks to respond to the growing imperative to localise, linking localisation and transformation targets to supply chain competitiveness. Another declared objective is that of moving towards a less 'top-down' intervention framework. Whereas possible beneficiaries were first recommended by the OEMs, more responsibility is now assigned to tier 1 firms, who nominate tier 2 suppliers that are allocated to an 'OEM sponsor' acting as a guide throughout their development process.

The increasing pressure on localisation and transformation has also led to the formulation of a black supplier development programme. This currently targets 15 suppliers for assistance over three years. Within this programme, which also sees significant participation by NAACAM, ASCCI tries not only to identify black suppliers with higher potential to upgrade, but also requires them to have a linkage within their value chain. In practice, once completed an 18-month support period, and if they meet the expected performance standards, the suppliers are expected to sign at least one supply contract within the value chain. As part of this programme, ASCCI is currently working with VW and Toyota suppliers. Overall, suppliers participating in the programme receive guidance in designing a business plan, competitiveness improvements, and in implementing lean manufacturing principles on the shop floor. At the same time, ASCCI prepares them to comply with government BBBEE requirements.

²⁵ From an interview with B&M Analysts, February 2018.

Despite a well-designed structure and the availability of resources, ASCCI has been accused of under-achieving and of not meeting localisation targets. In this regard, they highlight several critical issues and potential challenges. The first concerns timing: the 18 months for the pilot programmes may not be sufficient, given the learning process the beneficiaries need to go through. Second, in respect of transformation, ASCCI has several concerns. The announced government requirement that firms achieve level 4 on the BBBEE scorecard by 2020 to access AIS benefits, might be too difficult to reach given the industry's present status. There is also an evident trade-off between the incentive for firms to localise and their risk of having their own BBBEE scorecard downgraded if they localise with white-owned suppliers. Despite the availability of funds, the number of black-owned suppliers eligible for the programme is small. ASCCI is presently compiling a database of black-owned suppliers, and to date has identified 50 firms. Where firms do not qualify because they are insufficiently black owned (51% black ownership is required), ASCCI encourages the exploration of ownership transactions and outsourcing opportunities.

Finally, ASCCI identifies technical barriers to localisation: including volumes, available technologies, global supply agreements, the cost of testing, etc. Irrespective of the viability of localisation strategies, such barriers often impose a significant constraint. Overall, as a strategy for the future, emphasis is placed on the need for a more targeted approach; for a stronger link between competitiveness and localisation; for stronger efforts to promote technological upgrading, innovation, and skills development, and for a longer-term approach to secure the completion of a proper learning process.

6.5.4. Automotive Industry Development Centre (AIDC)²⁶

Established and sponsored by the Gauteng provincial government, the AIDC has a slightly different orientation compared to the other stakeholders considered above. Although it is also engaged in promoting the competitiveness of the SA auto industry, and of the Gauteng cluster in particular, it has a more development-oriented approach than the other industry-led initiatives. While also committed to localisation and supply chain development as both objectives and tools to promote growth and investment in the sector, they expressly insist on the quality of the support provided rather than on the profits generated by their programmes. With regard to localisation and transformation, the AIDC intervention revolves around two main initiatives: the promotion of Automotive Incubation Centres and the supplier development programme.

The incubation project entails the creation of hubs linked to a single OEM (one at Ford Silverton has already established, and two in Winterveld and Rosslyn have recently been launched), with the objective of promoting black entrepreneurs or black owned suppliers. Potential black entrepreneurs are selected among individuals showing 'business acumen' and willingness to set up a new venture, but not possessing the capital to do so. They are given access to the OEM facilities, they may receive additional government support to procure tooling, and the AIDC assists them with a mentoring/coaching programme of up to three years, during which they are expected

²⁶ This sections draws on interviews held with members of the AIDC.

to accumulate both component manufacturing and financial management skills. Eventually, they obtain a qualification and a set of competences related to finance and project management, HR, quality management, lean manufacturing etc. Having completed the programme, they are supposed to be 'mature' enough to independently enter the market space, where they can also develop multiple supply contracts. However, they generally tend to maintain a preferential relationship with the OEM that guided them throughout the learning process.

As part of the supplier development programme, the AIDC currently works with 30 companies in the Gauteng province. The programme is not exclusively addressed to black and locally owned firms, but these have priority and access to higher subsidies and discounted rates. While the assistance given may be tailored to the firm's needs, the projects in place generally cover issues related to lean manufacturing, total product maintenance, quality management systems, continuous improvement (kaizen methodology) etc. In addition, a 'cleaner production' programme was recently launched, with a focus on energy and water saving techniques, packaging, waste management etc.

When discussing present challenges and strategies for the future, the AIDC highlights several issues. For example, while considering the incubation programme as an overall success, which could positively be extended to all OEMs, they underline how securing demand is a necessary precondition. In this sense, without the commitment of an OEM to guarantee business for at least 5-7 years, and to guide the entrepreneurs/suppliers in the making, setting up an incubation hub is too risky. In terms of financial assistance, emphasis is placed on how funds for transformation projects are made available, but the mentorship and the technical expertise required to make programmes successful is often inadequate. At an institutional level, one issue is the frequent fragmentation and lack of coordination between different offices (including the dti and DST), which often hampers the smooth functioning of the programmes, causing delays that negatively affect the success of new entrepreneurs and suppliers.

6.5.5. Durban Automotive Cluster (DAC)²⁷

The DAC is a regional programme in KwaZulu-Natal. It was founded as a public-private-partnership in 2002 by local automotive component manufacturers, Toyota SA, and the eThekweni municipality. Developed as a forum to promote the competitiveness of the local auto cluster, it has 44 participating companies who collaborate with local government officials to develop business plans in three main areas, 1) skills development, 2) manufacturing excellence, 3) and localisation and growth. Transformation is considered a transversal mission, which permeates projects across all business plans. The localisation and growth programme has the strongest transformation focus. Where possible, a firm's intention to localise is matched with an available black-owned supplier, or with a black entrepreneur looking to establish a partnership. While previous attempts to develop black suppliers from scratch has proven to be costly and inefficient, a supplier development model based on the formation of joint-ventures with established suppliers is now being tested. The DAC is currently running three pilot projects involving JVs: one in metal

²⁷ This draws on interviews with B&M Analysts and DAC (February-March, 2018).

bending and two in electronics covering different components. The DAC considers the localisation and transformation goals included in the Automotive Masterplan attainable, but only through a joint effort of all stakeholders involved in the industry, and with support and commitment from the OEMs.

7. Auto policy and institutional fragmentation: Implementation challenges

South Africa's fractured institutional governance creates major challenges to effective policy development and associated policy deployment. Based on our experience, the challenge exists at three levels. First, it raises the opportunity for political intrusion in technical decision-making processes; second it creates an environment where policy misalignment is made possible; and third, it creates space for regulatory misalignment with policy objectives. All three of these elements have been experienced by the authors in respect of MIDP policy reviews, and the development of the APDP and post-APDP policies. Each of these is unpacked below.

7.1. Political intrusion in technical processes

The level of benefit attained by OEMs and component manufacturers in respect of government policy support has ensured that all larger firms retain the services of well paid (and incentivised) government officers whose job is to ensure continued public-sector support for their operations. These senior ranking officials involve themselves deeply in policy development processes and coordinate detailed inputs into the technical work required to identify policy deficiencies and improvement opportunities by policy development teams working on behalf of government. This is a valuable service to a point, but the lobbying influence of the industry is strengthened by information asymmetry. Firms can and do threaten that the production of a future model is at stake or even that the plant may be shut down. It is very difficult, if not impossible, for government policy makers to assess the veracity of these threats given that they lack full information about the strategies of MNCs. A further problem emerges when consultations with the government officers are completed and policy decisions finalised by the policy development team. At this point, the government officers typically evaluate the policy recommendations very narrowly (i.e. with the interests of their own firm in mind only) and either support (where there is a gain for their firm) or oppose the policy recommendations (where benefits are deemed to have declined).

Where opposition occurs, the process is typically to engage with the policy development team to convince them of errors in their conclusions drawn; and then when this fails to proceed to private political engagements, either directly with ministers within the Cabinet's Economic Cluster, or the political representatives of vulnerable constituencies – knowing that they will forcefully engage with the ministers that fall within the Cluster. This process was played out by the industry in respect of the development of the APDP and has occurred again in respect of the development of the Automotive Masterplan. As an example, the technical team recommended a level of VAA support that was deemed sufficiently generous (with this supported by rigorous modelling work

and expert input), and yet the VAA level that was finally introduced was substantially higher (33% more) than the recommended level, resulting in subsequent damage to the integrity of the APDP when launched in 2013. This is clearly a very damaging form of policy failure.

7.2. Intra-departmental misalignment

The second form of failure relates to policy misalignment within government technical structures. Two cases are worth reflecting on here. The first relates to BBBEE, and the second to the EU Economic Partnership Agreement (EPA).

In respect of BBBEE, one of the major dynamics of the South African automotive industry is its multinational dependence. Given South Africa's small domestic market, limited national system of innovation, weak skills base, and comparatively high operating costs, the future of the industry remains dependent on key, export oriented multinational corporations. These multinationals determine what models are produced in South Africa, the volume and market for exports, and how South African production and associated processes of technology transfer fit into their global production footprint. Operating as OEMs or as Tier 1 or Tier 2 component suppliers, these multinational subsidiaries compete with global sister plants that are 100% owned by their parent companies. Enforcing BBBEE equity requirements on these firms in South Africa as a formal policy position runs entirely counter to attracting or maintaining their presence in South Africa. While multinationals can meet their equity obligations by offering government equity-equivalent offsets, the process operates as a tax that is not incurred in sister plants globally, rendering South African operations less attractive to multinational investments. This issue was raised as a major concern in almost every OEM and Tier 1 and Tier 2 component manufacturer interview completed at multinational firms in 2016 when developing the Automotive Masterplan.

The issue is equally contradictory in respect of the EU EPA. The base agreement provides South Africa with duty free access to the EU market, while the EU has a 7 percentage point preferential access to the South African market.²⁸ The South African and EU automotive industries have both done very well out of this arrangement, with large scale EU imports into South Africa countered by the EU being South Africa's most important export market. However, when the EPA was negotiated, South African officials gave the EU duty free access to the South African market for vehicles powered by internal combustion engines (ICEs) of 1,000cc or less. At that stage, it was deemed that these types of vehicles would not be sold in South Africa, hence the duty-free access. And yet, imports of these vehicles are surging. ICE technology globally has advanced rapidly over the last decade, with further substantial progress likely over the next 10-15 years. This is being driven by increasingly onerous vehicle fleet fuel consumption requirements in the world's major markets, which are themselves being driven by tightening carbon emission standards. Global automotive research suggest that ICEs will become substantially smaller, more powerful and more fuel efficient, as the global vehicle industry transitions to alternative powertrain technologies.

Very small internal combustion engines are, therefore, expected to increasingly dominate the South African market over the next decade, with this trend already gathering momentum. The

²⁸ An 18% import duty instead of the standard 25%.

consequence is that the South African fiscus lost an estimated R650 million from 32,000 sub-1,000cc EU-sourced vehicle imports in 2016 alone. These figures could triple or even quadruple over the next few years, as small, small-to-medium, and even full-size passenger vehicles and Sport Utility Vehicles (SUVs) enter the South African market with 1,000cc or smaller engines. Duty losses alone could exceed R2 billion annually within a few years. Fiscal losses aside, the impact of duty-free market access could be dire for South African automotive production, with all sub-A, A, B, and even C-segment passenger vehicle and small Sport Utility Vehicle (SVU) production for the domestic market potentially ceasing over the new decade unless this specific EPA loophole is addressed.²⁹ The most likely casualty in respect of South Africa's existing CBU assembly base is the loss of Volkswagen Polo production. The Polo is now available in the EU with a sub-1,000cc capacity engine, thereby ensuring that Volkswagen's large-scale South African production base is no longer protected by any duties. Because of this, Volkswagen SA is likely to cease production of the Polo in the country at the end of its existing model lifecycle (which is 2024).³⁰ How did South Africa misalign the EU EPA negotiations so dramatically? Why was the ICE technology shift not seen? How does this impact on the future development of the South African automotive industry?

7.3. Inter-departmental misalignment

The final misalignment occurs in respect of inter-departmental policy-regulatory failures. Two examples demonstrate this challenge. First, when the APDP was being finalised in 2008, regulatory definitions and associated negotiations with the industry continued beyond the policy development phase, resulting in some major unintended consequences. For example, it was agreed that the PI earned by OEMs could be rebated at the CBU rate of 25% rather than the component rate of 20%, thereby providing OEMs with a benefit level 25% higher than modelled (and recommended) by the policy team that developed the APDP. Similar gains were made by industry negotiators in respect of APDP qualifying materials, thereby ensuring increased benefit levels for OEMs. Regulatory definitions are non-marginal in complex incentive structures and can lead to substantially increased benefits being secured by industry participants. When the benefits are payable in the form of duty rebates, the consequence is higher import penetration levels in the South African market.

A second example, is the way South African tax authorities administer the ad valorem tax on imported vehicles. The ad valorem excise tax is presently calculated on the import duty inclusive value of imported vehicles. Where an imported vehicle has had its duty rebated by using APDP rebates, the ad valorem tax on the imported vehicle is based on the rebated value. This means that rebates have the additional benefit of lowering the rate of ad valorem excise tax levied on imported vehicles. This has two major impacts: The dutiable portion of the imported vehicle is discounted – thereby reducing the ad valorem tax payment; and the base value of the import is

²⁹ Domestically produced vehicles that fall into this category include the Volkswagen Polo and Polo Vivo, and the Toyota Corolla and Toyota Corolla Quest. Until recently, General Motors also assembled the Chevrolet Spark in South Africa, but this was discontinued in 2016.

³⁰ The largest Volkswagen Polo plant globally is in Valencia, Spain. This is the plant that is presently producing sub 1,000cc Polo models.

reduced by 25% - thereby changing the base ad valorem tax calculation, and further reducing the ad valorem tax payment on imports.

In combination, these two impacts significantly reduce the amount of ad valorem taxation that is paid on imported CBUs, and by implication the ad valorem tax paid on imported CBUs relative to their locally produced equivalents. By reducing the ad valorem tax burden, CBU imports have a potential cost advantage over their locally made equivalents. As indicated in Table 10, when South African CBU production cost competitiveness is calculated at a 25% premium to international equivalents (which may be the case for entry-level vehicles³¹), low value imported CBUs incur a lower ad valorem tax than potential South African sourced products when the CBU duty rate is fully rebated. This is evident for imported CBUs at both the R100,000 and R200,000 mark; and may be one of the reasons why no South African-based OEM manufactures any sub-A category passenger vehicles domestically, and why no South African based OEMs are investigating the potential to manufacture entry priced vehicles domestically in future.³²

Table 10: Ad valorem tax on locally produced CBUs, relative to ad valorem tax on equivalent imports (at various price points) – SA vehicles at a 25% price premium

Recognized Value (RV) of locally produced vehicle	R 125 000	R 250 000	R 375 000	R 500 000	R 750 000
Imported value	R 100 000	R 200 000	R 300 000	R 400 000	R 600 000
Ad valorem (AV) excise duty – locally produced vehicle	R 3 304	R 14 484	R 32 947	R 58 158	R 126 935
AV excise duty – imported vehicle (25% duty included)	R 4 920	R 21 420	R 49 770	R 89 880	R 205 380
AV excise duty – imported vehicle (25% duty rebated)	R 3 105	R 14 145	R 33 120	R 60 030	R 137 655
AV excise saving on imported units using duty rebates	R 1 815	R 7 275	R 16 650	R 29 850	R 59 210
Import premium vs local CBUs – AV at 25% duty	R 1 526	R 6 936	R 16 823	R 31 722	R 78 445
Import premium vs local CBUs – AV rebated	(R 199)	(R 339)	R 173	R 1 872	R 10 720

Source: Authors own calculations

How a policy interface with regulations and tax structures is critical to its impact, and it is therefore necessary that the inter-relationship between these variables are well understood in policy, regulation and tax setting processes. Failure to do so will result in potentially damaging unintended consequences.

8. Looking ahead: Regional markets and technological change

8.1. African market dynamics and emerging production capacity (outside of SA)

³¹ Entry level vehicles have a much higher assembly cost share than larger vehicles.

³² None of the seven OEMs surveyed in August and September 2017 indicated any intention of manufacturing entry level vehicle models through to 2025. The closest to a sub-A category product manufactured in South Africa is the Polo Vivo, which is a full A-platform vehicle.

Notwithstanding the recent trough in the commodity cycle, African growth rates since 2000 have been impressive, and in some cases even spectacular. It is, however, a striking fact that manufacturing has not kept pace. The level of industrialisation remains low and manufacturing has declined as a share of GDP. However, with rapid growth, conditions have become more conducive to manufacturing development and the question is whether a more deeply rooted process of industrialisation is starting to emerge.

The first point to make in relation to the automotive industry in Sub-Saharan Africa (SSA) is that, along with the burgeoning middle class, the market is growing very rapidly albeit from a low base (Black and McLennan, 2016). Most of this demand is being met by imports because outside of South Africa, production is almost non-existent. Under SSA's 'structural adjustment' programmes of the 1980s, protection of infant automotive industries was dramatically reduced (Pelletiere and Reinert, 2002; Beuving, 2006). Liberalisation allowed used vehicles to flood into the region from advanced countries. Vehicle imports, therefore, provide a good proxy for market size and imports of light vehicles into SSA (excluding South Africa) amounted to 1.5 million vehicles in 2013, having grown at 14% per annum since 2003 (Table 11). With the economic downturn in many countries, this rapid growth has not been sustained, but projections show that the light vehicle market (including South Africa) will be very significant by 2030.

Table 11: The market for new and used light vehicles in SSA, 2003-2013 (000s)

Region	Vehicle type	2003	2004	2005	2006	2007	2008	2009	2010	2011*	2012*	2013*
SSA (incl. SA)	Passenger	587	707	883	1,066	1,259	1,186	1,124	1,124	1,464	1,654	1,839
	Light Trucks	187	200	258	388	431	361	341	257	296	331	341
	Total	773	908	1,141	1,454	1,690	1,547	1,465	1,381	1,760	1,984	2,180
SSA (excl. SA)	Passenger	339	406	463	584	825	856	866	787	1 068	1 214	1 388
	Light Trucks	79	68	88	188	227	192	223	124	147	175	172
	Total	419	474	551	773	1,051	1,048	1,089	910	1,214	1,388	1,561

Source: UN Comtrade; Eurostat Comext Database; Japanese Customs and Tariff Bureau; US International Trade Commission; and OICA

*South Africa only started to report its BLNS exports post 2010.

The reality is that SSA consists of numerous small economies. The combined SSA market is, however, significant with a GDP of \$1.66 trillion and a passenger vehicle market of 1.84 million units per annum. A comparison with India indicates the extent of the problem, but also the opportunity (Table 12). The total GDP of SSA and India as well as average per capita GDP and population are of the same order of magnitude. Vehicle market size is also similar. The major difference comes in production. India produces its own vehicles while Africa is import dependent. India is also a significant exporter with net automotive exports of \$8.3 billion. It also has its own brands, such as Tata and Mahindra. SSA is heavily reliant on imports and apart from South Africa, exports very little. As a result, the region had an automotive trade deficit of \$16.3 billion in 2013 (Table 12). There are, of course, limitations to this rather simplistic comparison. SSA is well endowed in resources, which implies a resource based comparative advantage. India has very limited resources in relation to its population size. But neither region has particularly strong

manufacturing capabilities. The key difference is that India has an integrated single market and this market is protected by a high, common external tariff.

As indicated above, the market for vehicles in SSA is growing very rapidly. This growing demand is for the most part being met by imports, especially of used vehicles. The question to which we now turn, is the prospects for expanded production in SSA. According to OICA, Africa as a whole accounted for less than 1% of global vehicle production (831,000 units) in 2014 (AIEC, 2015: 38). South Africa accounted for the bulk of this output, followed by Morocco and Egypt. These figures exclude nascent assembly operations in several SSA countries. Outside of South Africa and some countries in North Africa, vehicle production is almost non-existent. The largest plant on the continent is in fact the 400,000 vehicles per year capacity plant built by Renault in Morocco with a total investment of \$1.2 billion. Automotive exports have expanded from \$0.4 billion in 2004 to \$5 billion in 2015 and automotive employment increased by 67,000 over this period (McKinsey, 2016:76).

Table 12: Comparison of Indian and sub-Saharan African markets, production and trade, 2013

Indicator	India	SSA
GDP (Current \$ bn)	1,875	1,659
Population (million)	1,252	937
Per capita GDP (Current \$)	1,498	1,771
New Passenger Vehicle market (000s)	2,554	1,839*†
Passenger Vehicle production (000s)	3,139	265
Tariff Level for Passenger Vehicles - HS87.03	100%	No Unified Tariff
Direct Employment in Industry	>1,000,000	120,000*
Passenger Car Imports – HS87.03 ‡	277	11,402
Passenger Car Exports – HS87.03	5,557	4,318
Commercial Vehicle and Bus Imports – HS87.02 & HS 87.04	46	5,701
Commercial Vehicle and Bus Exports – HS87.02 & HS 87.04	902	1,342
Motorcycle Imports – HS87.11 (000s)	29	75
Motorcycle Exports – HS87.11 (000s)	1,648	1.3
Kits Imports – HS87.06 & HS87.07	121	241
Kits Exports – HS87.06 & HS87.07	272	11
Vehicle Parts Imports – HS87.08 (\$ millions)	3,479	4,835
Vehicle Parts Exports – HS87.08 (\$ millions)	3,913	727
Motorcycle and Bike Parts Imports – HS87.14 (\$ millions)	438	489
Motorcycle and Bike Parts Exports – HS87.14 (\$ millions)	371.7	4.5
Net Automotive Trade Balance (\$ millions)	8,273	(16,340)

Sources: World Bank Group; UN Comtrade; OICA; SIAM

* Estimates † New and used passenger vehicles ‡ All trade figures in \$ millions

Egypt also has an industry which has been established for many years. The country now faces growing international competition especially because of the Euro Mediterranean Free Trade Agreement (EuroMed) with the EU under which tariffs are scheduled to decline to zero as soon as 2019. Imports have risen sharply and 59% of vehicles sold in 2014 were locally assembled, down from 66% in 2004 (El-Haddad et al, 2015). Domestic production is spread across many small-scale assemblers, none of which have economies of scale and are unable to compete

against growing international competition. Total production of vehicles was approximately 180,000 in 2014. If one considers light vehicles only, estimated average model volumes are approximately 10,000 units per year with the largest volume model being a pick-up which is produced in volumes of 25,000 units per annum. This makes it impossible for component suppliers to achieve the production runs required to be competitive without heavy protection. As a result, local content is quite limited; in many cases including only components such as wiring harnesses, air-conditioners, seats, axles, exhausts and smaller components such as batteries. Vehicle exports are minimal and have declined since the 2008 peak to around \$50 million in 2014. This is despite a generous export subsidy. Component exports are more significant and amounted to \$270 million in 2014. Both costs and quality are limiting factors in international markets (El-Haddad et al, 2015).

SSA production is dominated by South Africa. In other countries, small scale assembly was established after independence in the 1950s and 1960s. This included assembly plants in Nigeria, Ghana and Kenya. There were also a few small-scale plants in white ruled Rhodesia. These plants assembled imported, completely knocked down (CKD) kits with minimal use of domestic content. Arguably these industries added very little value. In addition, there was some production of peripheral and aftermarket parts in a few countries. The parts manufacture that existed was generally small scale, imposing a large burden on consumers with little economic benefit. Much of this small-scale industry was swept away by a combination of economic decline from the early 1980s as well as 'structural adjustment' policies imposed by the IMF and World Bank.

The situation is now somewhat different. First, there has been sustained economic growth in SSA since 2000 and as indicated above, there has been rapid growth in African car markets. Secondly, levels of protection are much lower than previously, and regional integration has made some progress in reducing tariff barriers within the region. In a continent made up mainly of small economies this is of great importance. Thirdly, there is a desire on the part of some larger countries in SSA to re-establish domestic production and to achieve this objective, a number of countries are putting the necessary policies in place.

Small scale assembly operations in Nigeria, Ethiopia, Kenya and Angola involve minor semi-knocked down (SKD) assembly with minimal or no local content. Automotive policies are however being developed and Nigeria has signalled its intention to re-launch its automotive industry following the introduction in 2013 of the National Automotive Industry Development Plan (NAIDP). The new policy ambitiously aims "to move as rapidly as is feasible to balance of payments neutrality and then into surplus" (NAC, 2014: 5). Tariffs have been set at 70% for built up cars consisting of a 35% duty as well as a 35% levy. But local assembly operations can import cars without the levy and require minimal initial investments as vehicles can be assembled on a SKD basis for five years before moving to CKD production. The result is that it was expected that by early 2015, as many as 23 firms would have signed up to assemble vehicles under the programme (Furlonger, 2014). But the difficulties in imposing order in a free import market have also been apparent as the due date to increase tariffs has been repeatedly delayed. Also, this is not assembly in the usually understood sense, but rather minor finishing activities. While it is

stipulated that firms should move towards CKD assembly within five years, there seems to be some flexibility in this regulation as well.

In Botswana, assembly of Hyundai vehicles under licence began in 1998 for the SADC market.³³ The plant with an initial investment of approximately \$50 million and a capacity of 40,000 vehicles per year was the largest automotive investment in SADC outside of South Africa but ceased production in 2000 because of financial problems in its holding company. The establishment of the Hyundai factory resulted in a few component investments in the country (Black and Muradzikwa, 2004). Some of these continue to supply export markets. Other SADC economies have for the most part small-scale component sectors catering primarily for the aftermarket. Mozambique, for example, has firms producing exhausts, batteries, tyres, radiators, brake shoes and springs. Many of these plants struggle to compete against South African firms in the tiny home market or in the region.

8.2. The potential for the development of regional value chains

One of the conditions for vehicle production is a viable 'automotive space'. For countries which neither themselves constitute large markets nor adjoin such markets, an 'automotive space' could take the form of a regional market where regional trade agreements grant easier market access to member states and effectively enlarge the market (Humphrey and Oeter, 2000). Nigeria has now overtaken South Africa as the largest market in SSA (if used car imports are counted). But even these two countries lack sufficient scale for a self-sustaining industry. If these two markets are stripped out, the average market size of the eight next largest SSA markets is only 40,000 passenger vehicles per annum, both new and used.

Regional automotive value chains have not developed to any significant extent in SSA. This contrasts with other developing regions such as ASEAN where regional value chains have become increasingly developed (Kobayashi et al, 2015). The only significant automotive trade within SSA consists of exports from South Africa to other African countries. Rapid growth in the rest of the region together with closer regional integration arrangements means that the continental market is of major importance to South Africa, second only to the EU. But this is one-way trade. In 2014, South Africa's automotive exports to the rest of Africa amounted to \$2.9 billion, equivalent to 27.3% of total automotive exports and an increase from 22.3% in 2010. SADC alone accounted for 22.2% of South African automotive exports in 2014. On the other hand, South Africa imported less than \$100 million worth of automotive products from the rest of the continent in 2014.

Regional integration is making slow but steady progress in SSA and the widely accepted central objective is to improve the prospects for industrialisation by expanding the regional market. The

³³ The origins of this investment are unusual in that it resulted in part from a trade policy wrangle within the Southern African Customs Union (SACU). As a member of SACU, Botswana was subject to the provisions of the MIDP. When this was introduced in 1995, Hyundai Motor Distributors had been operating a semi knocked down operation supplying vehicles to the South African market. The plant was given a temporary special concession to continue subject to moving to full CKD assembly within a specific timeframe.

five main overlapping trade agreements, the Southern African Customs Union (SACU), the Southern African Development Community (SADC), the East African Community (EAC), the Common Market for East and Southern Africa (COMESA) and the Economic Community of West African States (ECOWAS) are well established and offer a degree of favourable market access amongst member states. There are also initiatives to develop a 'tripartite agreement' including SADC, COMESA and the EAC. The Tripartite Free Trade Area (TFTA) including SADC, COMESA and the EAC was launched in 2015. Negotiations are underway to establish a Continental Free Trade Area (CFTA), which would bring together 55 countries with a population over one billion people and a combined GDP of more than \$3 trillion (Vickers, 2017).

COMESA has an imperfect but functioning Free Trade Area (FTA) among 15 of its member States and is in the process of operationalizing a Customs Union. Its two largest members, Kenya and Ethiopia, have not traditionally been significant trading partners even though they share a common border. The East African Community (EAC) is a smaller grouping of five countries that progress including significant elements of a Customs Union and is currently moving towards a Common Market. While it may be argued that the efficacy of both these economic blocs in boosting trade among their member states has a long way to go, the fact that they are in motion lends credence to the suggestion that a viable automotive trading space could emerge within them.

The biggest obstacle facing industry integration within the region is the cost of trade diversion, which is potentially very high given the large presence of low priced pre-owned cars in most national markets. Why, for instance, would Ugandans want to buy (relatively expensive) cars made in Kenya, rather than cheap, imported pre-owned cars from Japan? While some progress has been made to resolve this, it is still a pressing issue. Kenya, which has over 25,000 units surplus capacity, managed to negotiate a common external tariff (CET) of 25% in the EAC for vehicles, a relatively large increase from Tanzania and Uganda's 0%. They also managed to get VAT in EAC members charged on the price of the vehicles at the factory gate in Kenya and not after transport (Ligami, 2014). However, the CET came to nothing as the member nations were granted a stay on the CET, meaning assemblers face 25% duties for Rwanda and Burundi and unconstrained competition in Tanzania and Uganda (Olingo, 2014). CKD assemblers also face bureaucratic hurdles with kits needing to be imported under the individual tariff lines of the components in the kits as well as a vague duty remission scheme (Olingo, 2014).

ECOWAS also established a CET in 2015, with passenger vehicle tariffs set at up to 20% depending on the size of engine. However, member states can add an Import Adjustment Tax (IAT), which Nigeria uses to raise the tariffs by up to 50% and the country also charges a levy on these imported vehicles. Nigerian auto assemblers, therefore, face uneven levels of protection across ECOWAS and smuggling is expected to intensify through other ECOWAS nations (Adeniyi, 2015).

We have argued that regional integration is critical to the development of regional value chains in the auto industry. The auto industry could in turn also be a driver of regional integration as vehicle producers place pressure on governments to increase market access and improve cross border

infrastructure (Lung and van Tulder, 2004). But it is also possible that it has the opposite effect in the short term as countries raise special tariffs to protect their industries. For example, Toyota's South African operation has seen a decline in exports to the rest of the continent because of higher tariffs in Nigeria and Algeria (AIEC, 2015).

8.3. Technological change: Future drivers of GVCs in developing countries

The difficulties facing the industry and the development of appropriate development policy are compounded by the current emergence of a set of major technological and other changes which are set to transform the automotive industry globally. We refer to these as emerging GVC drivers and have grouped them as follows: (a) developed economy vehicle fuel economy requirements and the movement to high technology, smaller displacement internal combustion engines; (b) the rapid evolution of alternative engine technologies; (c) green manufacturing requirements; (d) new materials; (e) infotainment and vehicle connectivity developments; (f) passive and active vehicle safety advances; (g) the disruptive potential of autonomous vehicles; and (h) the emergence of mobility services and potential displacement of private vehicle ownership. These are all critical issues shaping the future of the South African automotive industry; and yet many of these GVC drivers do not yet feature prominently in the domestic or regional market. How does the South African automotive industry respond to these GVC disruptors? What are the policy implications and likely impact on the South African automotive industry?

We make no attempt to put forward definitive positions in respect of the implications of the various GVC disruptors for South Africa. Our intent is rather to raise the questions on the implications of these GVC disruptors for an automotive economy that has a high level of economic dependence on the sector, but that is at best a fast follower in an innovation cycle that is invariably led from within the Triad economies that continue to dominate value addition within the global automotive industry. If, as in the case of South Africa, there is a clear national strategy to industrialise, with the automotive industry seen as pivotal to this process, then how are the various GVC disruptors factored into future policy and industry development processes? We have unpacked each of the seven identified GVC disruptors below.

8.3.1. Developed economy fuel economy requirements and the movement to high technology, smaller displacement internal combustion engines

EU and US-based (state-level) vehicle fleet fuel economy requirements are becoming increasingly onerous, with sizable sanctions for the non-attainment of set targets. This has seen several OEMs penalized over the recent period. These requirements do not feature in developing economies, such as South Africa. In fact, vehicles manufactured for the South African market often need to have their Engine Control Units (ECUs) adjusted to run on the country's Euro-3 fuel specifications. This has major consequences for local OEMs who need to manufacture vehicles with different engine specifications for domestic and international markets. Given South Africa's small domestic and regional market, exports to developed economies such as the EU are a requirement when introducing a new model; and yet the products typically produced for the domestic market (e.g. chassis-based Light Commercial Vehicles) are inherently less fuel efficient than the small ICE passenger vehicles manufactured and sold in markets such as the EU. Will the sale of products, such as chassis-based LCVs, be increasingly squeezed out of the EU market

as fuel economy requirements tighten? If so, what technology replaces these vehicles? Will these technologies challenge the dominance of chassis-based LCVs in developing economies, such as South Africa? Will the chassis-based LCV specialization that we see in the South African and Thailand OEM industries be threatened by such a technology shift? As developed economy markets embrace tighter vehicle fuel economy requirements, will invaluable export markets be closed off to South African OEMs? Could technology displacement occur, disrupting the value proposition of four of the seven OEMs who are largely dependent on LCV production (Ford, Nissan, Isuzu and Toyota)?

8.3.2. The evolution of electric engine technologies

The movement towards plug in electric hybrids (PHEVs), followed by full battery-electrical vehicles (BEVs) is projected to gather pace over the next few years. These forecasts keep changing and have become much more upbeat over the last few years as battery costs fall and regulation tightens. A comprehensive report by Bloomberg New Energy Finance in February 2016 predicted 5% of global vehicle sales comprising EVs by 2022 rising rapidly to 35% by 2040 (Bloomberg, 2016). More recent predictions, however, are even more bullish. Exane BNP Paribas predicts that penetration will exceed 25% by as early as 2030 and carmakers are rapidly bringing in new electric models. Nissan, for instance, expects that 20% of its sales in Europe will be EVs by 2020 (Gibbs, 2017). But what does this mean for South Africa?

China is the world's largest EV market with sales last year of over 400,000 units. The government is planning quotas that could require that 8% of vehicles are BEVs or hybrids by next year.³⁴ The Indian government has announced ambitious plans to transition rapidly to BEVs using an innovative strategy involving the leasing of batteries to public transport operators.³⁵

And yet markets, like South Africa, barely sell any hybrids, while BEVs are restricted mainly to demonstration vehicles running from the head offices of OEMs in the country, and a few selected charging points. The balance of the sub-Saharan African market is dominated by the sale of pre-owned developed economy products, with all products either petrol or diesel powered. What will the conversion rate to PHEVs and BEVs be in an economy like South Africa's? While the question is complicated in South Africa's case because of the economy's electricity mix, which is predominantly coal-based; is it feasible to project substantial conversion to PHEVs or BEVs in markets where there is limited fiscal space to subsidise rapid conversion to alternative, greener engine technologies, nor much base market demand?

Should a fiscally constrained Tier 2 automotive economy such as South Africa invest heavily in new automotive infrastructure and incentivize the adoption of new emerging technologies, or attempt to develop behind market opportunities that manifest in demand for ICE-based vehicles

³⁴ See 'Volts wagons' *The Economist*, 18 February, 2017.

³⁵ See 'Modi government plans major policy push to promote e-vehicles'. *The Economic Times*, 27 May 2017.

<https://economictimes.indiatimes.com/news/economy/policy/modi-government-plans-major-policy-push-to-promote-e-vehicles/articleshow/58351446.cms>

operating in an established petrol/diesel-based infrastructure? In some ways the transition will be easier for developing economies as their automotive industries are less invested in the large scale industrial infrastructure which could become rapidly obsolete if the more optimistic predictions for electric vehicles are realised.

8.3.3. Green manufacturing requirements

While the emergence of ISO14000 as an environmental management requirement is now ubiquitous within automotive GVCs, the industry in developed economies (as well as in rapidly developing economies such as China) is under significant pressure to secure carbon neutrality, and to eliminate the use of materials that may be damaging to the environment. As these requirements tighten in developed economies, developing economy production platforms with even only a small output into developed markets will need to conform to the requirements set. This has major potential consequences for OEMs and component production plants in Tier 2 automotive economies. Local content in South African assembled vehicles is low for various reasons, but one factor is the need for exported products to have 100% conformance with developed economy market requirements. OEMs will only source locally when they are confident that full legal conformance with the most onerous market supplied is adhered to – for example, the EU's End of Life Vehicle legislation. The alternative is simply to import the component required, thereby eliminating the risk. As requirements become more onerous, and new dimensions are added to the existing range of requirements, what are the consequences for South Africa? Will the costs of compliance remain similar to existing levels, or will the costs rise to levels shifting the entire value proposition of the South African automotive supply chain?

8.3.4. New materials

The potential use of composites, embedded nano-technology, and durable, light materials such as aluminium, could fundamentally change the nature of vehicle production going forward. It could also create new additive manufacturing opportunities throughout the automotive value chain. As highlighted in Hagel, et al (2016), these developments will have a transformative impact on all manufactured products, and associated manufacturing processes, as they change the economics of production. Does the increased use of these materials represent a major opportunity or threat for the South African automotive supply chain? Per the green manufacturing question, will the increased use of these materials shape market consumption and production in developed economies, with this then influencing legislation and associated market regulation? And, if so, what is the likely impact on South African automotive plants? With R&D largely consolidated at head office locations, how can the domestic supply chain position itself for the potential materials changes that could emerge? Should the South African government be intervening to secure insights into the future materials direction of the OEMs, and working to identify localization opportunities for potential developments?

8.3.5. Infotainment and vehicle connectivity developments

Every vehicle model change sees substantial improvements in both the quality and the range of in-cabin infotainment services. Internet and broader satellite connectivity has fundamentally changed the levels of intelligence that exist within the cabin of a vehicle. In respect of both information and entertainment, even entry level modern vehicles stand apart from previous

generations of luxury models. While this has had a hugely positive impact on the driving experience of individuals, the cost of the infotainment systems that have been incorporated within vehicles (and here we believe the gap between developed and developing economies is smaller than for the other GVC disruptors) has placed significant pressure on the balance of vehicle costs – costs that are often incurred from local production sources. In a South African environment, where metal pressing, metal fabrication, plastic moulding, and sub-assembly and assembly processes, dominate automotive value addition, the consequences are potentially dire, with the inevitable cost squeeze driving firms from the industry, and reducing industry value addition (and hence employment). If infotainment systems were manufactured in South Africa, then a zero-sum game would ensue, with the production of infotainment systems compensating for the value addition loss in “commodity production areas”, but to-date infotainment production has largely been confined to developed automotive economies. All of these developments together with the development of autonomous vehicles (discussed below) signify electronics comprising a rapidly increasing share of the value of a vehicle. This is an area in which the South African automotive sector is rather weak.

8.3.6. The disruptive potential of autonomous vehicles

The predicted commercial launch of autonomous vehicles (AVs) in selected markets, will have a profound impact on the global automotive industry. Again, forecasts vary but according to the Black Rock Institute (2017), fully autonomous vehicles will take off rapidly from 2025 with 75% adoption by 2035. This will fundamentally affect production and markets in Tier 2 automotive economies. As this new technology rolls out, it is argued that production for local and international markets will be re-shaped, and that domestic markets may similarly be affected as the benefits of autonomous vehicles are widely demonstrated. While all of this may be true, how long will the technology spillover take? The realization of autonomous vehicles requires major structural changes in both market and production infrastructure. Will the movement towards autonomous vehicles create another schism between developed and developing economies, at least in the short term? The level of maturity of developing economy automotive markets remains some distance from that of the developed economies. How will the emergence of autonomous vehicles influence the growth in vehicle consumption across developing regions such as SSA? And more, directly, what are the consequences for the South African automotive value chain – from the domestic market to vehicle assembly to component manufacture? Will it increase regional demand for vehicles or limit the scope for market growth? Will it aid or hinder the creation of a viable regional automotive production space, the importance of which is articulated above? Or does it depend on the final key disruption force we have identified, as unpacked below?

8.3.7. The emergence of mobility services as potential displacement of private vehicle ownership

The emergence of on-demand mobility services such as Uber and Lyft will have a major impact on private vehicle ownership levels across developed and developing economies especially with the advent of autonomous vehicles³⁶. One extreme forecast argues that that by 2030 transport-as-a-service (TaaS) providers will supply 95% of US passenger miles using fleets of autonomous

³⁶ See Uber: From zero to (seventy) billion, The Economist, September 3rd, 2016.

electric vehicles (Arbib and Seba, 2017). Even significantly more limited penetration of this mode of transport would have a dramatic on automotive manufacturing and related sectors including the oil industry. Car ownership would decline dramatically with far fewer vehicles on the road but doing much higher mileages, and therefore being replaced more frequently. The effect on ICE production could be catastrophic, although tremendous benefits would be realized in terms of vehicle safety and reduced congestion and emissions. Urban land markets would also be substantially transformed with much reduced need for parking, for instance, and greater levels of urban density made possible. Of course, other scenarios could materialize including much greater private ownership as roads become capable of maintaining higher vehicle densities (when combined with vehicle autonomy), and shared vehicle ownership replaces bulk public transport is replaced with shared mobility services.

The Boston Consulting Group (2017) suggests four possibilities – the first being private ownership of AVs alongside conventional vehicles and the second being a takeover by AVs. In the third scenario, urban transport is dominated by ‘robo-taxis’ and in the fourth scenario urban transport becomes dominated by the ‘ride sharing revolution’. The first scenario has a negligible effect on the number of vehicles in cities but the third and fourth scenarios have dramatic effects with the number of vehicles reduced by 46% and 59% respectively. But, the take up is likely to be delayed in developing country contexts.

9. Concluding remarks: Policy implications and recommendations

The auto industry represents South Africa’s single most important industry policy intervention. We have indicated that it has been only partly successful with some important gains but also serious failings. We have also emphasised the importance of broader factors to the success of the industry: a growing economy and market, strong infrastructure, a rapid expansion in the skills and technology base; as well as effective bargaining with multinationals, ongoing supplier development, and the deployment of clear strategies such as regional value chain development to position the industry for future growth. The realisation of the ambitious objectives set out in the 2035 Auto Masterplan requires a comprehensive focus on each of these elements.

Where does this leave the South African auto industry regarding future policy support? Should government continue to support the industry and if so on what basis and for what reason? Automotive support is very costly. Why not reduce protection further and transfer support to more deserving sectors? After all, vehicles have been assembled in South Africa for nearly a century and the sector can hardly be characterised as an infant industry requiring initial protection. Furthermore, there is little evidence to date that South Africa is becoming an export hub. These questions must be answered; and it is difficult to argue the case for ongoing high-level support for the auto industry without providing an explanation of how greater dynamic comparative advantage might be developed and South Africa’s gap reduced in relation to low cost rival producer countries.

Conditions for the successful development of the automotive industry in developing countries remain the same as they always have been – a viable ‘automotive space’, ongoing improvements in competitiveness, the ability to attract major investment, and supportive trade and other policies.

With a large potential SSA market, substantial efforts to improve competitiveness (both inside and outside the factory), appropriate policies to regulate competition, as well as growing links to the region, the South African automotive industry has the potential for unprecedented growth over the next few decades. All the attributes are in place – good infrastructure, established firms and production capabilities, affordable wages - and now the prospect of a large, regional market.

The South African Automotive Masterplan lays down the aspirational objectives that could be realised by 2035, but as highlighted in this report, the country's automotive policies, regulatory framework, tax structures, and various support programmes need to be better aligned to ensure the industry contributes more substantively to South Africa's broader socio-economic and more specific black-economic empowerment objectives. Based on our policy experiences to date, and lessons from successful competitor economies such as Turkey and Thailand, we propose a far more institutionalised approach to automotive policy development in South Africa going forward. The auto masterplan has indicated the direction the industry should follow, and the soon to be announced APDP-extension to 2035 the proposed policy instruments to support the realisation of the masterplan from 2021, but what is still needed is an institutionalised process where government, NAAMSA, NAACAM and NUMSA proactively engage to monitor industry progress against the objectives set and work to identify and support solutions to challenges being experienced.

The policy steps that have been taken to correct APDP distortions post 2020 focus on its excessive import bias, and on ensuring APDP benefits earned are correlated with industry localisation levels, and hence industry employment aggregates. The two critical elements in this regard relate to the correction of the ad valorem import bias and the replacement of the VAA with a Volume Assembly Localisation Allowance (VALA) that is based solely on localisation levels. These two recommendations represent critical corrections to existing APDP biases that limit the full extent of its positive impact on the domestic automotive industry, and by implication its contribution to the development of the South African economy. The recommendations are also intended to ensure the components industry remains adequately incentivised to grow outside of OEM supply. Finally, while not a direct APDP policy element, it is imperative that the South African government correct the EU-SA EPA that permits the duty-free importation of 1,000cc and smaller engine EU-sourced vehicles into South Africa. This aspect of the EU-SA EPA has a potentially major negative impact on the future of the South African automotive industry, and hence the effectiveness of the APDP post-2020, particularly as this is when we anticipate substantial growth in domestic market demand for such vehicles.

The South African government is required to continue providing substantial support to this major industrial sector to ensure it continues to grow and develop. However, policy instruments need to be refined to secure stronger developmental outcomes, particularly in respect of localisation, associated black economic empowerment, and employment creation. We believe that the recommendations made for the post-2020 period could play a critical role in correcting existing APDP deficiencies and fostering alignment between national automotive policy and the objectives of the SAAM through to 2035.

The period from 2021 to 2024 represents a key opportunity to review the impact of the revised APDP to the realization of the auto masterplan. The Key Performance Indicators (KPIs) for automotive industry development are clear: Local content creation (value addition), employment expansion, growth in local production share of the domestic market, improved trade and current account performance, and the increased participation of Black-owned firms within OEM supply chains. It is critical that these KPIs are monitored and that individual OEM contributions to the targets set are closely evaluated. We have recommended the extension of the amended APDP to 2035 to ensure policy alignment with the auto masterplan, but it is critical that a new institutional structure takes responsibility for coordinating periodic reviews of the APDP to ensure that the policy supports the realization of the auto masterplan's 2035 vision, and its associated objectives. This together with coordinated action with regard to skills upgrading, infrastructure development and ongoing regional integration can ensure that the ambitious objectives of the masterplan are realised.

10. References

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