Autos for Africa?

Possibilities and Pitfalls for an Automotive Industry in Africa

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Abstract

Sub-Saharan Africa (SSA) has grown very rapidly over the last decade. Demand for light vehicles has rapidly increased in this period, albeit from a very low base. Growing demand is almost entirely supplied by the import of used vehicles from the developed world. This has led to an enormous automotive trade deficit in the region where, apart from South Africa, there is almost no domestic production. The dissertation establishes the trends and scale of automotive demand in SSA and then considers the question of whether and how the region can begin to meet this booming demand by developing its own industry. Despite limited industrialisation levels and relatively small domestic markets, some larger countries, such as Nigeria and Kenya, are putting policies in place to encourage domestic production. However, if countries follow individual national strategies it is unlikely that any will have sufficient market scale or investment levels to become sustainable automotive producers. A regional automotive strategy needs to be adopted in SSA in order to attract large scale productive investment.

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The automotive production is a major global industry with production occurring at multiple locations around the world. In the recent past this industry has undergone a fundamental change as production has shifted away from traditionally wealthy nations to the newly industrialising. One region that has largely been ignored in this shift has been Sub-Saharan Africa (SSA). Many countries in the region are seeking to redress this and create domestic automotive industries. Unfortunately there is little accessible data on the automotive market in SSA. If countries are to establish automotive industries then this needs to be rectified. The level of demand, its composition and the dynamics of supply all need to be ascertained for appropriate policy decisions to be made. As starting an automotive industry almost certainly requires careful intervention, the nature of these policy frameworks will contribute greatly to the success or failure of the industries created. The policy options available are varied and already countries have started down very different routes.

The core question of this dissertation is then whether SSA, or any of the major countries in it, are at present viable spaces for an automotive industry. However, the very dearth of our knowledge of almost any aspect of the automotive industry in the region makes this question impossible to answer. As such a vital prior query is: what are the current and expected levels of automotive demand and who currently supplies the vehicles? However, this is not enough to ascertain the viability of an automotive industry in SSA since, as noted before, the specific policies employed are a determining factor of success. As countries have already initiated policy to achieve their automotive aspirations it needs first to be asked: what are these polices and, with a knowledge of the automotive market in these countries, how are they expected to perform? The second policy question which needs to be asked is: what policy if any would best enable SSA, or countries within the region, to become viable automotive spaces? The core question of the dissertation can then be answered.

Methodology

The vast majority of this dissertation has been the product of desktop research, digging through journalistic and scholastic articles and interviews. There are only two sections that require substantive explanation in this methodology section. These are my methods for estimating the numbers of individuals over an income threshold in the future and the current automotive market size in SSA.

Estimating Future Middle Class Population Numbers

Seldom is reliable data available of countries' income distributions. This data is very useful to poverty researchers and so significant efforts have been committed to creating approximations of the distribution. To this end Kemp-Benedict (2001), building on earlier research, finds that it is possible to build a reasonable income distribution approximation using population, GDP and Gini coefficient figures. Building on this Kemp-Benedict finds that lognormal curves best approximate a country's income distribution.

As such, to estimate the percentage share of the population over a certain income the approach of Dollar and Kraay (2002) was used. This assumes income distribution to be log normal, GDP per capita to be the mean of the distribution and the variance to be estimated using a country's Gini coefficient. Dollar and Kraay (2002) develop a methodology for this type of estimation using the fundamental work on lognormal distributions by Aitchinson and Brown (1966) and Johnston, Kotz and Balakrishnan (1994) amongst others. If the income distribution is lognormal it can be shown as:

$$\sim N(\mu, \sigma)$$

They use the logged value of a country's GDP per capita as the mean of the log normal distribution (μ) and then calculate the standard deviation of the distribution using its Gini coefficient. Defining the Gini coefficient, on a scale of 0 to 100, as G then the standard deviation is given by:

$$\sigma = \sqrt{2}.\Phi^{-1}\left(\frac{1 + G/100}{2}\right)$$

With the mean and standard deviation of the log normal distribution known, one is then able to calculate the percentage of the population above a certain threshold. [1] This is possible by using the z-table to calculate what percentile of the lognormal distribution a certain income level occupies. The formula for this is:

$$Z = \frac{X - \mu}{\sigma}$$

Where X is the log of the income level being searched for. Z is the Z-table value which is then used to find the corresponding percentile for the desired income level. To find the number of people living above the income threshold the percentile value is subtracted from 1 and then multiplied by the country's population figure. Using the process above it is then possible to forecast future SSA income and population levels. Using the IMF's GDP predictions combined with the UN's population estimates the GDP per capita values in current dollars can be estimated up to 2020 (International Monetary Fund, 2015; United Nations, 2015). The Gini coefficients used for 2020 are drawn from the UNU-Wider World Income Inequality Database and held to be the same as their most recent, high quality estimate.

[1] Many thanks to Thomas Rooney for putting up with my many questions in this regard.

Calculating Current SSA Market Size

Creating an estimate of the current vehicle market in SSA is necessary due to the lack of accurate reliable figures. Searching through government and institutional records of car ownership or sales in the majority of countries in SSA yielded next to nothing. Unsurprisingly the numbers which are quoted for vehicle parc are almost always wild estimations. Estimating the total number of vehicles in countries then seemed both near impossible and less important that estimating vehicle flows. Estimating flows is assisted by the fact that there is no large scale domestic production in SSA meaning that accurate trade flows into the region are a good proxy for the total size of the market, as long as South Africa, where domestic production exists, is treated differently. For South Africa's market I was instead able to use the detailed reporting of the National Association of Automobile Manufacturers of South Africa (NAAMSA) for the market size. For the rest of SSA trade data was used. Unfortunately automotive trade data from SSA countries is rife with missing entries or unbelievable numbers. As such rather than using import data from the countries themselves to track their imports mirror data from exporters was instead used.

Problematically just as there are issues with SSA import data so there are issues with other countries export data. This is especially due to the informal nature of much of the used car trade, the difficulties of accounting for smuggling and the weakness of some countries' trade reporting. The work of Fuse et.al (2009) assisted in vastly strengthening the estimates. They use multiple databases and correct for the errors using methods established by Tsigas et.al (1992), to estimate the global trade in used vehicles in 2005. While imports of used vehicles are spread quite evenly throughout the globe, exports are concentrated in a just a few countries (Fuse, Kosaka & Kashima, 2009: 355). The major high-income vehicle producing regions, the EU, US and Japan, accounted for a minimum of 85% of all used car exports in 2005 (Fuse et. al, 2009: 355).

As such I used the Eurostat Comext Database, Japanese Customs and Tariff Bureau and US International Trade Commission datasets to form the backbone of the market estimate. All three also report new and used vehicle exports separately in their trade statistics allowing deeper analysis (Fuse, Nakajima and Yagita, 2008: 2437; Fuse et. al, 2009: 355; Schneider et al., 2010). However, even these datasets are still prone to the inaccuracies resulting from smuggling and under-valuation which occur once vehicles have entered SSA. The most reliable data source for imports from countries other than Japan, the US or EU is to use the mirror data from the UN Comtrade database and count countries exports as SSA's imports. [2]

Even when UN Comtrade data is available there are some other issues. One is the possibility that double counting exists if the exports from non-producing SSA nations are included. This occurs where cars have been imported to a nation due to its good ports or low duties and then are counted as exports of that nation to its neighbours. As such all export from SSA to SSA countries, other than South African exports as it is a vehicle producer, have been dropped, possibly leading to an under representation of trade. There are also a few nonsensical entries in the UN Comtrade data, most notably; entries showing all of SACU registering impossibly

[2] For what HS codes I used please refer to Appendix C.

high imports from South Africa in 2010 when South Africa changed its reporting methods.[3] These are adjusted so as to be representative of the trends in the data. A country's market estimate is then the sum of exports from the EU, US and Japan, drawn from their individual trade data, and the sum of exports from world excluding these three groups and SSA barring South Africa, drawn from UN Comtrade.

The two exceptions to this are South Africa and Nigeria. South Africa, as was noted earlier, accurately records its market size through its producer organisation and so this was used. Nigeria is a much more complicated case. As the magnate for most of the smuggling in West Africa and the largest economy in Africa the trade figures did not seem at all accurate. This was represented by some of the largest importers in 2013 being small countries, such as Benin and Togo, in its region. To get an estimate of Nigeria's market size, and that of its neighbours, therefore requires an adjustment for smuggling. Golub (2012) calculates that at least 95% of Benin's imports and 85% of Togo's are re-exported legally and illegally (Golub, 2012: 1155). The vast majority of these vehicles are destined for Nigeria so an estimate of 85% of Benin's imports and 75% of Togo's heading to Nigeria was used. This percentage of exports destined for those countries was then instead attached to Nigeria. It was also estimated that 5% of Benin's imports ultimately end up in Niger, the second largest destination for smuggling and re-exporting and the same process used.

[3] It is highly unlikely that Botswana, Lesotho, Namibia and Swaziland each imported in (000's) 3 212; 242; 1785 and 985 passenger cars respectively in 2010 and then 8.9; 3.3; 15.7 and 3.1 in 2011. Especially since if viewed as percentages of their populations the 2010 imports represent 160% of Botswana getting cars, 12% of Lesotho, 82% of Namibia and 83% of Swaziland. More likely this is an error due to South Africa not reporting SACU members in its trade reporting until 2010.

Chapter 1: Introduction

Automotive production is a major global industry with production occurring at multiple locations around the world. Traditionally the industry's major producers have been more technologically advanced, wealthier countries but developing countries have increasingly become the producers of choice. Asia in particular, has benefitted, receiving huge levels of foreign direct investment (FDI) and a boost to industrialisation. Sub-Saharan Africa (SSA), however, has almost no automotive production. Whilst this may be expected because of historically low levels of income in SSA, a comparison with India provides for a striking contrast (Table 1).

India has similar population and GDP levels to SSA but is a major vehicle producer and in 2013 had an automotive trade surplus of $8.2 billion. In contrast, SSA has very little production and had a 2013 trade deficit of $16.3billion in the automotive sector. With demand growing rapidly in Africa, and projected to reach 10 million passenger vehicles a year by 2030, this raises the important question of where these vehicles will be produced. Will they continue to be imported or can Africa start to develop its own industry?

Table 1: Comparison of Indian and sub-Saharan African markets, production and trade, 2013 ($ million unless otherwise stated)

	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 ≠	276.54	11 402.09
Passenger Car Exports – HS87.03	5 556.47	4 317.72
Commercial Vehicle and Bus Imports – HS87.02 & HS 87.04	45.84	5 701.31
Commercial Vehicle and Bus Exports – HS87.02 & HS 87.04	901.61	1 341.59
Motorcycle Imports – HS87.11	29.05	74.59
Motorcycle Exports – HS87.11	1 648.22	1.32
Kits Imports – HS87.06 & HS87.07	120.89	241.24
Kits Exports – HS87.06 & HS87.07	271.69	11.15
Vehicle Parts Imports – HS87.08	3 479.12	4 834.93
Vehicle Parts Exports – HS87.08	3 912.79	726.95
Motorcycle and Bike Parts Imports – HS87.14	438.07	489.29
Motorcycle and Bike Parts Exports – HS87.14	371.65	4.53
Net Automotive Trade Balance	**+8 272.92**	**-16 340.2**

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

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

If SSA does not manage to produce its own vehicles, it not only misses a significant employment opportunity but will bear increasingly severe current account pressures as the trade deficit widens. However, a poorly designed automotive policy could be even worse for SSA as the opportunity costs of protecting and supporting the industry are high. It is especially problematic that investment and employment benefits of a SSA automotive industry would not automatically be shared evenly among the many countries in the region. This will encourage individual countries to initiate polices to advance their best interests, quite possibly at the cost of their neighbours and the region. This is already happening in Nigeria. How the region as a whole responds to these challenges will determine the failure or success of a SSA automotive industry.

The second section traces the interactions of industrialisation, growth and automotive production in the literature. The third section analyses consumption and production in SSA, primarily outside of South Africa. It shows rapidly increasing demand, very little production and considerable interest in new investment. The fourth section outlines the aspirations of countries in SSA with regard to the automotive industry. A number are trying to foster domestic production to spur industrialisation, employment growth and improve their trade balance. This is the reason for the flurry of interest in new investment. The fifth section tackles the question of whether SSA is actually a viable 'automotive space'. This section highlights the challenges that any automotive industry establishing itself in SSA would face and what possible policies could be introduced to create the optimal result. The sixth section concludes.

Chapter 2: Linking the Automotive Sector to Growth

Industrialisation and Growth

As the global North emerged from the destruction of WWII and the global South gained independence it became clear that vast income differentials between the two existed. The great challenge for development from the 1950s onwards was how to increase incomes in the global South. A defining initial realisation driven by Prebisch (1950) and Singer (1950) was that the value of primary commodities relative to manufactured goods had deteriorated over time.[4] The global division of labour meant that developing countries focused on the production of primary commodities and were therefore doomed to permanent poverty. This created an understanding that the 'structure' of developing countries' economies needed to be altered for them to be able to catch up to developed countries and not perpetuate in poverty.

Later analysis expanded on the nature of the structural change which occurred as countries moved out of poverty and developed. Kuznets (1966), amongst others, identified that it was the movement of labour out of agriculture into manufacturing and services that was a hallmark of the development process. Quantitative analysis by Chenery and Syrquin (1975) and others confirmed that poor countries have a large share of labour in agriculture while rich countries do not. Van der Meer and Yamada (1990) found that labour productivity in agriculture is lower than labour productivity in industry and that industry productivity grows rapidly in developing countries. This drives the reallocation of workers from agriculture to industry.

Shifting resources out of low productivity sectors into high productivity uses is then of vital importance to developing countries. Ajakaiye and Page (2012) describe structural change as often the biggest driver of economic growth in poor countries. The necessity for countries to undergo structural change if they are to develop is largely agreed upon. Countries cannot rely only on the primary sector to grow. To this end Chang (2013a) argues that even if commodity price shocks and declines are ignored, exploiting natural resources without industrialisation is unlikely to produce long-term economic development, as the primary sector is simply not large enough and in high productivity industries usually has poor labour absorption. Monga (2012) surmises: "no countries have really gone from low to high income without undergoing a transformation from an agrarian or resource focus to industry or services".

Industrialisation has shown itself to be crucial in creating structural change. In developing countries, industry is a relatively more productive sector than agriculture. McMillan and Headey (2014) add that the labour which manufacturing can absorb includes workers with moderate skills who receive relatively good wages. Hsieh and Klenow, (2009) find that within industrial production there are also opportunities for resources to move to more productive types of industry and even within these industrial activities firms differ in productivity levels. Even if producing exactly the same product Soderbom (2012) finds that larger firms operate completely differently to smaller firms in developing countries. There are large gains in output per worker which occur as production methods change for the same product. Additionally manufacturing firms in developing countries are able to imitate technologies and practices of frontier firms. Rodrik (2013) found that this phenomenon has led to an unconditional global convergence of labour productivity in manufacturing, while

[4] That this was a long run historical trend has been confirmed by more recent authors, such as Harvey, Kellard, Madsen and Wohar (2010) who confirm the trend over four centuries.

economy wide convergence does not occur**.** A further implication of industry is that it allows for the diversification and sophistication of production, a characteristic that many studies have linked to faster growth and higher incomes (Imbs & Wacziarg, 2003; Cadot, Carrere & Strauss-Kahn, 2011; Hausmann, Hwang & Rodrik, 2007; UNIDO, 2009). Industry then is vitally important to create structural change and growth.

What is the State's role?

There is growing consensus amongst academics that market forces alone are not enough to initiate industrialisation and structural change, the state has a vital role to play (Page, 2011; Kaplinsky & Morris, 2014; Morris, Kaplinsky & Kaplan, 2012; Chang, 2013a, 2013b; Aryeetey & Moyo, 2012; Lin & Monga, 2011; Monga, 2012; Lin & Chang, 2009; Cimoli, Dosi & Stiglitz, 2009; Greenwald & Stiglitz, 2006). To what extent the state should be involved in driving structural change and in what manner have been sharply contested by different schools of thought. The area where much of this debate has centred is industrial policy, which Aryeetey and Moyo (2012) define as: "the actions of the government in re-allocating resources to support industrial development". Industrial policy has experienced varying levels of support over time (Aryeetey & Moyo, 2012). In the 1960s and 1970s industrial policy had support from arguments that it could be used to resolve pervasive market failures. In the 1980s it lost its appeal as evidence of governmental failure grew and neo-classical economics rose to prominence. However, by the late 1990s the 'Washington Consensus' had been unable to create growth and Asia had experience rapid growth using industrial policy, returning it to relevance.

Industrial policy has continued to be debated. In trying to end the questions of its legitimacy Chang (2011) argues that industrial policy has been used by all successfully industrialised countries during phases of growth, as well as many developing countries when they were experiencing relatively higher growth rates. Chang (2011) posits that industrial policy is quite possibly a "necessary, although not sufficient, condition for economic development". Slowly a consensus of industrial policy's necessity and legitimacy is being reached with even neo-classical economists accepting industrial policy (Lin & Chang, 2009)[5]. The debate has then gradually transformed into a discussion of what role and form industrial policy should take when a country attempts to use it to effect structural change and growth (Page, 2011; Monga, 2012; Aryeetey & Moyo, 2012).

The clearest difference in opinion as to the role of industrial policy is well developed in the debate between Justin Lin and Ha-Joon Chang (2009). The core of the difference of opinion is whether industrial policy should be 'comparative-advantage-enabling' or 'comparative-advantage-defying' as Lin describes it. Lin and others believe that industrial policy has a role in countering market failures and allowing a country's optimal industrial structure to emerge, in line with its comparative advantage. The surplus that is then generated allows the rapid accumulation of human and physical capital which slowly alters the country's endowments and hence comparative advantage. In contrast if industry which deviates from a country's comparative advantage is encouraged then there are high costs of protection and the industry cannot quickly become internationally competitive. This means it struggles to generate a surplus and alter endowments or ever mature.

[5] This was a debate between Justin Lin and Ha-Joon Chang facilitated by the Development Policy Review and later published in the journal.

In contrast, Chang argues that it is vital for a country to defy its comparative advantage for industry to upgrade. Chang's views are clear in a 2011 paper where he defines industrial policy as: "policy that deliberately favours particular industries over others, against market signals, usually (but not necessarily) to enhance efficiency and promote productivity growth". In Lin and Chang (2009) he argues that accumulating capital and technological capabilities in an industry does not automatically lead to industrial upgrading, as capabilities and capital are industry and even process specific. Crucially, technological capabilities are mostly accumulated through production, making it impossible for a developing country to develop capabilities in an industry without defying its comparative advantage at that time and entering it. It is also impossible to know how fast technological capabilities, and international competitiveness, in an industry will be acquired until that industry has actually been entered.

In Lin and Chang (2009), Chang does warn that comparative advantage should not be ignored as it can provide an indicator of the cost of entering a new industry. The further the industry is away from comparative advantage the larger the costs of protecting it. If the deviation is too large then the costs of protection could well outweigh any advances in productivity. In essence there is a lot of uncertainty and risk involved in industrial policy but it is sometimes necessary to use it to defy comparative advantage, hopefully increasing productivity and fostering growth.

The protection of industries that Lin and Chang (2009) and others discuss often relies on restricting free trade. Krugman envisages in his 1987 paper that while there are scenarios where governments restricting trade is in their national interest, there are also a myriad of challenges in implementing this. Using trade policy as a first best policy response can often have unintended negative impacts and political economy concerns. Free trade is then a good rule of thumb. A number of authors agree, arguing that even if it is theoretically appropriate industrial policy is often very difficult to implement (Aryeetey & Moyo, 2012; Monga, 2012; Page, 2012). A government needs specialist knowledge and high levels of bureaucratic competence when intervening in a sector or industry directly, as in trade policy. It is vital for countries to only aim to design industrial policies for which they have the bureaucratic capacity to implement successfully (Aryeetey & Moyo, 2012; Monga, 2012; Page, 2012).

Structural Change and SSA

Despite recent growth Africa has achieved only limited structural change. Monga (2012) finds that export diversification, manufacturing's contributions to GDP and employment have all either not improved or actually gotten worse in the last 40 years for Africa. Morris and Fessehaie (2014) support this, finding that Africa's recent growth has been driven by primary commodity exports. Additionally the growth that has occurred has not brought with it sufficient job creation or social progress. Page (2011) adds that both the diversity and sophistication of products produced in Africa has decreased over time. Similarly Morris and Fessehaie (2014) report a lack of diversification in products exported.

How this reality has interacted with structural change in Africa in the recent past is examined by McMillan, Rodrik and Verduzco-Gallo (2014). Surprisingly they find that structural change has actually had a growth retarding effect. This phenomenon has occurred since workers and capital have moved from more productive to less productive sectors in Africa from 1990-2005. Globalisation and the exposure to competition that it heralded raised the productivity levels of African industry, but in this process workers were shed who returned to

lower productivity activities. This negative effect actually accounts for much of the difference between Africa and Asia's respective economic performances from 1990-2005. However, McMillan et al. (2014) also found that structural change was starting to have a positive effect post 2000 in Africa, as manufacturing slowly starts to grow.

It is a widely held belief that industry needs to be revitalised and grown as rapidly as possible in Africa, to generate positive structural change and growth (Page, 2011; Ajakaiye & Page, 2012; Chang, 2013; McMillan et al., 2014; Morris & Fessehaie, 2014). The exact approach to achieve this and what industries Africa should focus on is less agreed upon. A number of authors hold that Africa must focus on its comparative advantage and develop manufacturing that reflects this (Aryeetey & Moyo, 2013; Lin & Monga, 2011; Monga, 2012; Page, 2012). What industry is thought to best suit Africa's comparative advantage differs. Aryeetey and Moyo (2012) advocate agro-industry as a key starting point, as does Page (2011). Monga (2012) suggests adopting a 'flying geese' approach with the aim to foster industries which countries that have experienced fast growth from similar endowments had 20 years ago. This will hopefully attract the transfer of capital and technological capabilities from these countries, as their endowments and hence comparative advantage has shifted out of the targeted industries, encouraging firms to relocate production. Morris and Fessehaie (2014) argue that it is by developing backward and forward linkages with the commodities sector that Africa will reap the greatest returns for employment and growth**.**

Automotive Industries and Industrialisation

The automotive industry has long been an industry that countries have sought to promote as part of their industrialisation strategies. Lall (1980) argues that an automotive industry is viewed as a vital component of the 'modern industrial economy' due to its linkage intensive nature. This can stimulate growth in other sectors of the economy, in essence acting as a catalyst for industrialisation, which can in turn drive structural change and growth. As such, the creation of an automotive industry was a mainstay of post-colonial developing countries' industrial policy, including in SSA. These strategies were part of larger import substitution industrialisation (ISI) policies. Lall (1980) finds that the automotive industries created under ISI industrial policy regimes largely failed, other than a few which managed to transition to become more competitive and export orientated. It is argued by Aryeetey and Moyo (2012) that the ISI supported industries of post-independence SSA failed as they were too far from countries' comparative advantage. Governments did not have sufficient bureaucratic capabilities to successfully implement the dynamic polices needed for industries to so defy comparative advantage.

The failures under ISI have not dampened developing countries desires to use industrial and trade policy to create domestic automotive industries. Nag, Banerjee and Chatterjee (2007) observe that countries' motivations are unchanged with the automotive industry still viewed as a catalyst for wide scale industrialisation. This is unsurprising given that the linkage intensive nature of the automotive industry is also unchanged. Lettice, Wyatt and Evans (2010) observe that three times as many people are employed in industries supplying parts to vehicle manufactures than by the manufacturers themselves. An additional factor encouraging developing countries to promote the automotive industry, highlighted by Nag et al. (2007), is the opportunity to benefit from firms relocating their vehicle production to lower cost developing countries. It is also encouraging to developing countries that the automotive industry is an industry which now developed countries, such as Korea and Japan,

were able to successfully develop in defiance of their comparative advantages at the time of establishment, as Chang describes in Lin and Chang (2009).

Unfortunately while some developing countries have succeeded in establishing automotive industries in defiance of their comparative advantage, many others' attempts have faltered and been costly failures or else never managed to reach their desired potential. Even if a country has all the indications of the potential to create an automotive industry getting the industrial policy right is a challenge. This is made even more difficult by the problematic political economy of a highly protected and symbolic industry, which attracts rent seekers and prestige policies. Aswicahyono (2000), Hale (2001) and Wad (2009) find that in developing countries, such as Indonesia and Malaysia, national car projects are particularly susceptible to these risks, performing poorly and succumbing to rent seeking.

That the automotive industry is linkage intensive is certainly a boon for industrialisation if true automotive manufacturing occurs. However, if countries are unable to move past assembly and cannot attract component producers then they are left with a costly, protected, inefficient industry with a net negative effect on the broader economy. In this vein Aswicahyono terms the Indonesian industry pre-rationalisation in 2000 "an old baby" which refuses to grow up. Fortunately for Indonesia a regional financial crisis and resulting regional policy changes forced the baby to grow up after 70 years. Sarwar et al. (2010) find an even worse result for Pakistan which has a floundering automotive industry with no prospect of change, some of which is immensely inefficient, publicly owned and a source of large public sector losses.

Requirements to Develop an Automotive Industry

When seeking to establish an automotive industry, successful developing countries have focused on assembly and manufacture. Design of vehicles is even further from a developing countries comparative advantage than production and so is seldom justifiable as part of an initial industrial strategy. When countries do try to embark on design it is often costly and unsuccessful (Wad, 2009; Hale, 2001).The norm for developing countries wishing to establish an automotive industry is to focus on attracting investment in localised production from established automotive producers, who already have the technological capabilities in design. Ruigrok and Van Tulder (1998) find that firms generally only relocate manufacturing capabilities outside of the 'Triad'[6] regions, where they enjoy efficient production, when they are faced with either trade barriers or difficulties in their domestic car production spaces, such as rising wages.

When trade restrictions are the motivation most firms invest so as to capture rents from high effective rates of protection, using very low investment plants to assemble surplus production from other manufacturing locations. Investment will usually only be increased if the producer is pressured to increase production in the developing country by its industrial policy. If this happens whether the producer increases its investment levels or exits the market is conditional on there being significant potential in the developing country's domestic market. If there is potential then trusted, captive, suppliers are usually encouraged to invest alongside the vehicle producer, transplanting the production network of the producer's home nation. Alternatively when firms are seeking to take advantage of international wage differentials

[6] The Triad are the developed automotive regions of Western Europe, Japan and the US.

more substantial investment occurs from the outset, with the aim of exporting production into markets which the firm currently supplies from its higher cost production sites. Sturgeon, Van Biesebroeck and Gereffi (2008), agree that cost factors ae a major driver for location decisions. They argue that since the 1980s there has been an intensifying approach where firms locate production in the lowest cost production locations within a region for that regional market. These firms demand that their largest suppliers also have an international presences.

What is universally agreed is that the viability of automotive assembly and production is very scale dependent. This is because in the automotive industry, total costs rise less than proportionally to output when the scale of production is increased. Black (2007) suggests there are three major reasons for this. More efficient methods of production and machinery are used in large scale production, including increased automation. There are enormous initial investments required for design and establishing production of a product with additional tooling costs for any later model changes, high volumes are able to lower the per unit cost of these investments. Labour and management are able to specialise further with larger scales of production.

For efficient production, firms need to produce at or above minimum efficient scale, which is the lowest level of production which exhausts all available economies of scale. Alcorta (1998) examines the impact of economies of scale and scope on production. Product scale determines the duration of a production run in that product, with longer runs requiring less frequent change overs to produce different parts. Economies of scope are found in automotive manufacturing. These exist where the production of multiple products together is less expensive than the sum of producing them individually. This can create multi-product economies of scale, where individual products may not benefit from large production runs but large total volumes can be obtained by producing multiple products.

What production level is of minimum efficient scale is not agreed upon, whether advances in flexible production practices have managed to lower these levels is a central theme of disagreement (D'Costa, 2004; Karmokolias, 1990; Jenkins, 1995; Abrenica, 1998; Sturgeon & Florida, 1999). Rhys (2004) finds that despite advances in management and production processes minimum efficient scale for assembly has remained at 250 000 vehicles a year. Black (2007) argues that flexible manufacturing has rather than lowering plant level minimum efficient scale instead allowed for a greater differentiation of models to be produced within a plant. This is supported by D'Costa (2004) who finds that flexible manufacturing practices do not reduce production levels, but rather that large production volumes are a necessary precondition for effective implementation of flexible manufacturing in a developing country.

One way to estimate minimum efficient scale is to refer to plant production levels in open markets. Sturgeon and Florida (1999) do just this and find that plants in a multinational vehicle producer's home country assemble on average 230 000 vehicles a year. In line with Ruigrok and Van Tulder (1998) they found that when a firm located production in a developing country for the purpose of exporting into existing markets production was still substantial, with 159 000 vehicles assembled a year on average. This suggests that minimum efficient scale of around 150 000 vehicles per annum can be achieved in low-cost labour

environments. However, production in developing countries for domestic consumption was on average 44 000 vehicles a year, well below minimum efficient scale.

Minimum efficient scales differ between automotive assembly and the various components used in automotive production. Karmokolias (1990), Black (2007) and Rhys (2004) all argue that as components often have extremely high costs to establish production they require larger production runs to meet a minimum efficient scale than is the case with assembly. Each component has its own minimum efficient scale and even within parts they may have their own constituent components with different scales. For example, engine block casting, machining and engine assembly all have different efficient scales. Rhys (2004) suggests that through using common platforms, where multiple models share 65% of the same costs, developing countries are more able to consolidate demand for high minimum efficient scale components across multiple plants.

Black (2007) argues that as fixed costs are higher, diseconomies created by low volume assembly are much larger for component producers than for assemblers. When examining firm motivation Karmokolias (1990) found that plants that assembled imported completely-knocked down (CKD) kits of 40 000 vehicles or more a year allowed low enough unit costs for profitability in protected markets. This means that when protected by tariffs on vehicle imports, assemblers are comfortable establishing plants which operate far below the minimum efficient scale of production. The diseconomies mean component producers will require their own set of industrial policies if they are to be attracted, as they will not simply follow protected assembly.

Process of Establishing an Automotive Industry in a Developing Country

Creating an automotive industry in defiance of a country's comparative advantage and technological capabilities is a challenge which has always required industrial policy support. The process of developing an automotive industry is unique in each country which attempts it, but there can be some common stages of development. There are also cases where countries have managed to transition directly to world class manufacturing and skipped any number of stages. The various stages of development that do exist are agreed upon by a number of authors (Karmokolias, 1990; Jenkins, 1995; Abrenica, 1998; Ruigrok and Van Tulder, 1998; Natsuda & Thoburn, 2011).

The first step usually takes the form of restricting imports of fully built up (FBU) vehicles, through tariffs or a ban, while encouraging the establishment of local assembly plants, at the cost of the consumer. In aberrant situations where a country is a particularly unattractive investment opportunity, usually due to a very small domestic market, but still imposes protection semi-knocked down SKD kits may be imported for assembly. Ruigrok and van Tulder (1998) note that SKD kits in their most extreme form are vehicles which are produced to completion, disassembled and then exported to the developing country for reassembly in a 'screwdriver' plant. Almost no value added occurs and the plants exist so as to avoid tariffs, often enjoying enormous effective rates of protection.

Any country which protects its domestic market and allows SKD imports needs to ensure that this is not a lasting situation as it brings none of the benefits of an actual automotive industry. There is no accumulation of technological capabilities, no linkage driven manufacturing growth, FDI is limited and the industry unsustainable without protection. Production of SKD kits occurs at a location where vehicles are produced efficiently and the viability of SKD

assembly is determined by a country's protection levels not the scale of assembly. The processes of assembly differ between SKD and CKD assembly so SKD assembly at large scales is neither necessary nor sufficient to initiate the transition to CKD. However, it could act as an indicator that there is a large enough domestic market that the investments required for CKD assembly are justified.

Allowing firms to start with SKD assembly may be used to encourage firms to invest in a country where an information failure would lead them to not commit to a higher level of investment and so shun a market with legitimate prospects. However, for this to be justifiable once the viability of the market has been shown firms must be required to ramp up investments and transition into CKD assembly. CKD assembly requires significant scales of production and investment to be economically viable. This makes a decently sized domestic market a prerequisite for attracting the necessary investment.

Abrenica (1998) stresses the need for wise local content rules so as to encourage domestic content without excessively raising costs in CKD assembly. This is important as components are where linkages are created. Local content rules were historically enforced through requiring that a percentage by value or weight of vehicles must be locally made. Alternatively targeted tariffs can be used to encourage domestic production of specific parts. Localisation policies typically initially focus on the less technical or more difficult to transport parts, such as wiring harnesses, batteries and radiators where domestic firms are more able to compete. As time passes so domestic manufacturing capabilities can increase through the technological capabilities gained from production as well as human and physical capital accumulated in the industry. This shifts the developing country's comparative advantage.

Abrenica (1998) suggests that an industry will make the transition from kit assembly to actual production when it becomes more economic to produce higher value-added components in the developing country than to import them. For this to occur, assembly needs to be of a large enough scale that component manufacturers can benefit from economies of scale. Karmokolias (1990) suggests that an investment and skill intensive process such as localised engine production is viable with annual production runs of 250 000 vehicles using the same engine. This will only happen if a country's automotive industry undergoes a rationalisation of the number of makes and models of vehicles they assemble concentrating in a few high volume models.

A rationalisation of an automotive industry is necessary to deal with coordination failure between assemblers and component producers. Black (2007) maintains that industrial policy is then required and justified to initiate it. There are multiple possible policy options open to developing countries trying to rationalise their automotive industry. The first option is simply to rapidly liberalise and remove protection from the industry. In response firms would have to be able to produce at global levels of efficiency or shut down, forcing successful firms to increase scale. However, this policy only would work if the comparative advantage shift generated from the CKD assembly phase has also produced assemblers capable of being globally competitive. They would require extensive investment to increase scale and firms would need to be convinced that the future of the developing country industry is worth that investment. Otherwise firms will simply exit the unprotected industry.

The second policy option Black (2007) reviews are stringent local content policies. If these are increased over time they can drive the rationalisation of an assembly industry if the

domestic market is large enough. This is because localisation policies, if correctly designed, can mean that the diseconomies created by assembling vehicles at low volumes are borne by the assemblers, not the component producers. This then incentivises assemblers to assist component producers to develop capabilities to produce at minimum efficient scale. This echoes Ruigrok and Van Tulder (1998) when they argue that a large protected domestic market will make automotive producers encourage captive component producers to transplant their production to the developing country, if it is cost effective. The component producers will only invest if they are confident that the assemblers will also increase their capacity.

Black (2007) warns that high local content requirements in a small market will incentivise assembly firms to increase their production runs rather than production levels. Essentially since the domestic market is not large enough for increased production volumes if investments are to be recouped the same models are produced for longer time periods. The impact of this is a domestic market supplied with dated vehicles at high prices. These factors also remove any real possibility of exports and continued growth in the industry.

A third policy option, outlined by Black (2007) which was popular with developing countries, is trade balancing. This required producers to at least partially balance their trade, with the aim of promoting exports. This encourages firms to invest in efficient production if they still wish to access the domestic market. It is attractive because firms were able to specialise in production of a single type of vehicle at minimum efficient scale and then export the surplus from the domestic market, while using imports to provide consumers with variety. A common mechanism was to allow exporters to offset duties on imports.

Black (2007) notes that none of the three policies directly address rationalisation and the coordination problem that needs to be solved. It may instead be better to have industrial policy that encourages a rationalised industry to emerge from inception rather than once it is already established. Limiting the number of firms or more directly the number of makes and models assembled in a country is a way to do this and can be coupled with production targets. If the domestic market is also protected then high volumes can be assured from an early stage, at the cost of consumer choice.

Once rationalisation has successfully occurred and if wage competitiveness continues, an automotive industry initially aimed at a domestic market can be globally competitive and may no longer require much protection (Abrenica, 1998; Jenkins, 1995). If an industry reaches a globally competitive level then exports should be able to provide the volumes needed for growth. The continued accumulation of capital, human and physical, and increased technological capabilities in the industry can also result in a competitive advantage over other production locations boosting export prospects. Alternatively production costs may rise and exports flag, threatening the sustainability of the industry. Not all countries follow this exact route, some do not ever drop import restrictions even once globally competitive or may never reach global competitiveness remain reliant on subsidies.

Considerations for supporting an automotive industry

Forecasting Domestic Demand

Protection is a vital component of establishing an automotive industry. Importantly Melitz (2005) argues that policy makers need to be sure that protection will generate higher

cumulative benefits than costs. Whether this is possible will depend to a large degree on factors that the developing country will only know about once it has actually entered the industry, such as whether it can be cost competitive. One factor that can be known, to a degree, before entering the industry is domestic vehicle demand and how it is projected to change. Throughout the process of developing an industry the absolute size of domestic demand informs both the decisions of firms and policy makers. Vehicle demand is determined by the rates of vehicle ownership in a country, which in turn are almost entirely dependent on income levels, with the majority of vehicle ownership forecasting relying on this relationship (Button, Ngoe & Hine, 1993; Dargay & Gately, 1999; Dargay, 2002; de Jong et al., 2004; Clark, 2007; Dargay, Gately & Sommer, 2007; Chamon, Mauro & Okawa, 2008).

O'Brien (1992) found that industry forecasters in the 1990s viewed vehicle demand as rapidly increasing when per capita income reached the $2 000 to $2 500 range. Button, Ngoe and Hine (1993) modelled the ownership of vehicles in 58 developing countries.[7] They found that in the lowest income countries vehicle stock was inelastic to income but in the slightly wealthier nations it was highly elastic, suggesting an income threshold over which demand increased. Storchmann (2005) developed the income threshold concept to include not only the income differences between countries but also within them. Storchmann (2005) found that in poorer countries an unequal income distribution means a portion of the population are able to reach the threshold for vehicle ownership more quickly than average per capita incomes suggest, whereas in a wealthy country inequality excludes a group from being able to purchase vehicles.

For developing countries the concentration of income is then a key factor in allowing individuals to access motor vehicles. Storchmann's work was used by Chamon, Mauro and Okawa (2008) to estimate the threshold level of income in developing countries. They found that the threshold for households to own vehicles is a per capita income level of around $5 000[8], the percentage vehicle ownership amongst households when per capita income is over this income level is radically higher than below it. The impact of income distributions means that in the case of large developing countries with relatively unequal income distributions, such as China, enormous demand will occur while the national per capita incomes are far below the threshold. This in turn means that more unequal countries where the per capita income is below the vehicle purchasing threshold will also exhibit higher per capita vehicle ownership rates than those that have more equal income distributions.

Cost of Protection

There are also social costs when a country restricts the free trade of vehicles. The costs resulting from restricted FBU vehicle imports are two fold, consumers not only have to purchase more expensive locally assembled new vehicles, but it also blocks their access to the global surplus of used FBU vehicles. These used vehicles flow out of developed countries and into developing country markets where they depreciate more slowly. Low cost used vehicles are able to create widespread social benefits by improving access to transportation, often in countries where alternatives are expensive or inefficient.

[7] These are countries with per capita incomes less than $3000 in 1986 (Button, Ngoe & Hine, 1993: 53).
[8] Constant 2000 dollars

Grubel (1980) identifies why developing nation households have higher willingness to pay for low quality vehicles than households in the developed world. There are four key reasons: lower labour costs in developing countries mean labour intensive repairs are less costly; lower levels of human capital mean a lower opportunity cost from breakdowns; lower incomes means lower demand for luxury and the combined factors mean a smaller depressive effect of new models on older model prices as advances in durability are not as prized. Gavazza, Lizzeri and Roketski (2014) find that the level of trade is determined by the degree of heterogeneity of willingness-to-pay and transaction costs. They also find that developed countries often use measures in their own countries to stimulate new vehicle purchases. The measures create transaction costs in developed countries' domestic used vehicle markets, making exports more attractive.

Pelletiere and Reinert (2004) use a gravity analysis of the global vehicle trade to show that FBU vehicle imports can be easily controlled by policy. They find that measures to restrict FBU vehicle imports drive up transaction costs and so limit used vehicle imports more severely than more expensive new vehicles. Clerides (2003) shows that used vehicle import restrictions have a substantial negative effect on consumer welfare by raising the price of vehicles, which also shrinks the market for vehicles. Clerides (2003) also finds that when restrictions on imports are relaxed, governmental income often increases, since although tariff levels may drop increased volumes of imports and registrations create a net positive impact on the fiscus. As such the protection of an automotive industry comes with a heavy cost and is only worthwhile if in the long term there are welfare gains.

Chapter 3: Sub-Saharan African Automotive Space

There is little accessible data on the automotive market in SSA. If countries are to establish automotive industries then this needs to be rectified. The level of demand, its composition and how it is supplied all need to be ascertained for appropriate policy decisions to be made.

Demographics

Changes in SSA for 2000-2013

SSA is changing. According to World Bank figures, since 2000 SSA has averaged a GDP growth rate of just below 5% (World Bank, 2015). While this growth is from an exceptionally low base it has meant that SSA's GDP has grown from just $362 billion in 2000 to a not unsubstantial $1.65 trillion in 2013[9] (World Bank, 2015). Per capita incomes have also vastly increased from $545 in 2013 to $1 760 in 2013 (World Bank, 2015). While this is impressive SSA remains by far the poorest region in the world. The 2013 GDP per capita for the second poorest region, developing nations in North Africa and the Middle East, is a substantially larger $4 693 (World Bank, 2015).

SSA is also undergoing rapid population growth. Africa has the fastest growing population of any major global region with its population growing at an average 2.55% per annum between 2010 and 2015 (United Nations, 2015). SSA seems to being growing even faster, averaging 2.68% annual growth between 2000 and 2013 with an increasing trend (World Bank, 2015). This has meant that SSA's population has expanded from 664 million in 2000 to 937 million in 2013 (World Bank, 2015). Urbanisation is out pacing population growth with an average annual rate of just over 4%, which has meant that the percentage of the population that is urbanised grew from 31% in 2000 to 37% in 2013 (World Bank, 2015).

The population is also very young, children under 15 accounted for 41% of the population in 2015 and another 19% are between 15 and 24 (United Nations, 2015: 7). The young population could lead to a demographic dividend where the percentage of the population of working age grows creating a high working population to dependant population ratio (United Nations, 2015: 7). However, this is reliant on the working age population actually being employed and SSA historically has had high youth unemployment rates, if not demographics will instead contribute to instability and social costs (United Nations, 2015: 7).

Projections into the Future

While SSA has been growing economically, in population and urbanising for around a decade and a half now, what of the future? With regards to economic growth all major organisations predict rapid growth to continue, despite the recent commodity price slump. The IMF World Economic Outlook predicted 5.1% GDP growth for SSA in 2016 which should grow to 5.4% by 2020 (International Monetary Fund, 2015: 170). This makes SSA second only to developing Asia in predicted growth and SSA nations feature prominently amongst the fastest growing nations in all IMF forecasts (International Monetary Fund, 2015). The World Bank is slightly more pessimistic, predicting 4.6% growth in 2016, and 5% in 2017 (World Bank

[9] The GDP figures are calculated using the current exchange rates for SSA, as exchange rates have also strengthened real growth is smaller than suggested by GDP figures.

Group, 2015). However, the trend is again an increasing one and only bettered by the two regions of South Asia and East Asia and Pacific (World Bank Group, 2015).

Population is expected to explode over the next decades. The UN predicts that Africa will account for over half of all population growth between 2015 and 2050 (United Nations, 2015). While UN figures are not perfect, specifically in some countries with poor reporting, they are still the best estimates available on population forecasting in the region.[10] Africa is predicted to have a population of 1.68 billion by 2030 and by 2050 will account for 25% of global population with 2.48 billion inhabitants, assuming decreasing fertility rates on the continent (United Nations, 2015: 3).

Between 2015 and 2100 28 African nations are expected to more than double their populations, amongst the 28 are 10 SSA nations which are projected to experience five-fold increases (United Nations, 2015: 4). Nigeria is expected to become the third most populous country in the world by 2050 with a population of 399 million people, by 2030 it is still expected to have nearly doubled its population to 263 million (United Nations, 2015:21). By 2030 there will be three SSA nations with populations over 100 million and 21 with populations over 20 million, Eastern and Western Africa will both have populations of over half a billion (United Nations, 2015:21). In 2050 there will be six countries with populations of nearly 100 million or more, and a total population of 1.12 billion between them (United Nations, 2015:21).

Table 2: Top 10 Most Populous SSA Countries according to UN Estimates

	Population in millions	
	2015	*2030*
Nigeria	182	263
Ethiopia	99	138
DRC	77	120
Tanzania	53	83
Kenya	46	65
Uganda	39	62
South Africa	54	60
Mozambique	28	41
Angola	25	39
Ghana	27	37

Source: UN Population Division 2015

In the longer term East Africa looks set to overtake West Africa as the fastest growing region of SSA while Southern Africa will continue to lag because of lower growth rates in South Africa (African Development Bank Group, 2011). Overall then SSA is set to continue to experience growth with some regions growing much faster than others. Consumer spending and the middle class are expected to continue to grow and at a much higher rate than per capita incomes (Deloitte, 2014). Household final consumption expenditure increased by 10.7% per annum in the 2000-2012 period and by 2030 over half a billion Africans are estimated to be middle class (Deloitte, 2014: 2).[11]

[10] The UN figures for Nigeria are disputed in The Economist. Revenue distributions in Nigeria and voting power in central government are determined by a region's population, incentivising census rigging towards larger numbers. Additionally the data on fertility rates used for UN estimates is dated and possibly now inaccurate as fertility rates are expected to have declined (The Economist, 2015).

[11] This estimate is based on middle class status being attained at a relatively low income level.

Countries with higher levels of inequality experience more rapid growth in automotive demand (Storchmann, 2005). This is because when the per capita income level is well below the threshold for vehicle ownership and a society is unequal more individuals are able to pass the threshold when incomes increase (Storchmann, 2005: 36) SSA's level of inequality is then important for projections of automotive demand. While Gini coefficients are well known for being difficult to measure they offer the best measure of inequality which is available (Chamon et al., 2008). Using the highest quality Gini figures available for the 2000-2011 period SSA has a simple average Gini of 44.4[12], which indicates intermediate levels of inequality (UNU-WIDER, 2014).[13] It seems unlikely that inequality will be radically reduced in SSA soon. Demand for vehicles generally grows faster than per capita incomes, as a small increase in income can push a significant percentage of the population over the threshold of affording vehicle ownership. As income distribution in SSA is relatively unequal, demand will grow especially quickly.

Using the information above it is then possible to forecast future SSA income and population levels. Using the IMF's GDP predictions combined with the UN's population estimates allows GDP per capita values in current dollars to be estimated up to 2020 (International Monetary Fund, 2015; United Nations, 2015). The Gini coefficients used for 2020 are conservatively held to be the same as their most recent, reliable reading. Using these values the percentage share of the population over a certain income can then be estimated using the approach of Dollar and Kraay (2002). This assumes income distribution to be log normal, GDP per capita is the mean of the distribution and the variance can be estimated using a country's Gini coefficient.[14] The forecast can then be used to estimate how much of the population will pass over the threshold income for vehicle ownership. Chamon et al.'s (2008) view is that at over a per capita income of $5 000 per capita a significant number of households start owning vehicles.[15] This does not suggest that anywhere close to every individual over the income level will own vehicles, but that a significant portion of the households they form will do so.

Applying the forecast, 272.1 million people are predicted to have a yearly income over $5 000 in SSA in 2020 (Table 4). This is a very significant 33.5% increase in just five years, from the current not unsubstantial 203.8 million which is reached using the same method. West Africa dwarfs the rest of the region primarily due to Nigeria having 85 million people earning beyond the threshold. Nigeria is then expected to shift 15 million people over the threshold in five years, this is 22% of the total of all people in SSA to cross the threshold in that period. Even at double the threshold, $10 000 where car ownership is usually ubiquitous at the household level, Nigeria is predicted to have 57.8 million individuals in 2020. As the threshold applies to households it is not implied that all these 272.1 million people will own vehicles. However, it does suggest that given observed trends a significant number of SSA households will have a vehicle in 2020. With this in mind, SSA's automotive demand could well reach significant levels in the near future.

[12] Not accounting for country size.

[13] The Gini coefficient data is drawn from the UNU-Wider World Income Inequality Database. This database uses primary and secondary sources to give a Gini coefficient variable for all countries. It also details the quality of and the methodology used to generate each Gini value.

[14] A detailed description of the methodology can be found in the Methodology section.

[15] In Chamon et al. (2008) they find that approximately 30% of household in China at the $5 000 level own cars and 75% in India.

Table 3: Estimated Top 10 Middle Class Populations

	Population earning over $5 000 per annum (millions)	
	2015	*2020*
Nigeria	70	85
South Africa	28.6	31.4
Kenya	12.2	17.4
Angola	9.1	15.4
DRC	9	13.9
Tanzania	6.9	10.4
Ghana	6.5	8.9
Cote d'Ivoire	5.8	8.2
Ethiopia	4.1	7.8
Uganda	5.4	7.4
SSA Total	**203.8**	**272.1**

Source: IMF 2015; UN Population Division 2015; Author's calculations

The Current Automotive Market in SSA

While the general growth trends in SSA are positive, what of the automotive market? Searching for reliable figures of car ownership or sales in the majority of countries in SSA is a formidable challenge. The accessibility, reliability and form of registration data varies significantly across SSA. Accurate estimates of the vehicle parc are also limited. For instance, WardsAuto cites total registrations for 2013 of 9.3 million and 1.4 million vehicles respectively in South Africa and Nigeria (WardsAuto, 2014). The South African figures are accurate but the Nigerian figures represent a major under-estimate.[16]

It is then prudent to not attempt to estimate vehicle stocks, but rather the annual flows of vehicles. A lack of large scale domestic production in SSA means that accurate trade flows into the region are a good proxy for the total size of the market, as long as South Africa, where domestic production exists, is treated differently. South Africa's market is known through detailed reporting by the producer federation in the country, the National Association of Automobile Manufacturers of South Africa (NAAMSA). Therefore, in calculating total SSA market size, South Africa's imports are not used, but rather the official statistics on market size provided by NAAMSA.

To track the flows of used cars is still a significant challenge. One complication is that generalised customs coding does not require vehicles to be classed as new or used. It is up to a country's customs agencies to require the classification and not all do so (Fuse, Kosaka & Kashima, 2009: 349). Classifications of what constitute a roadworthy vehicle and its value are also not uniform. For example, one country's export-barred end-of-life vehicle (ELV) may be classified as a functioning vehicle by another (Schneider et al., 2010). Even between countries with the same standards there is invoice manipulation and freight fees are not applied in the same manner, sometimes passenger vehicles are recorded at "free on board" values and at other times "cost, insurance and freight" value (Fuse et al., 2009: 349; Brooks, 2012). This means that the value of exports given by a country is almost always vastly different to the value ascribed to the exports by the importing country.

[16] Nigeria has now overtaken South Africa as the largest economy on the continent and it is implausible that its vehicle parc would only be 15% the size of South Africa's. The author's estimates are that annual light vehicle sales in Nigeria amount to 738 442 vehicles per annum and that even conservatively the vehicle parc is over 5 million.

In addition to these administrative issues, there is also widespread smuggling and grey importing in SSA. Vehicle smuggling is by no means unique to SSA and is endemic in the trade, even in regions with much tighter control on their borders. It occurs on a massive scale inside the EU (Brooks, 2012; Beuving, 2004; Golub, 2012; Fadahunsi & Rosa, 2002; Schneider et al., 2010). It often is also quite ingenious and notoriously difficult to tackle, oft cited examples of this are Russian sailors who carried cars as cargo on their return journeys from delivering timber to Japan, and members of the Pakistani diaspora who sent used cars back to Pakistan and avoided a used car import ban (Fuse et al., 2009: 349; Brooks, 2012: 83; Fuse, Nakajima & Yagita, 2008: 2437).

Unrecorded flows mean that even trade statistics are not fully capable of accounting for the used car trade. Nor can they account for the flow of new passenger vehicles particularly accurately in SSA as flows include unaccounted parallel 'grey' imports. This is where surplus passenger vehicles from dealers outside the region are moved into SSA, often despite regulations against their trade. According to interviews with industry experts the scale of this trade in SSA is unknown but significant. Even the producer organisations are only able to give estimates for the numbers of new passenger cars they are supplying to almost all of SSA (OICA, 2014).

The lack of concrete figures leads to countries having multiple competing estimates of vehicle markets and parc. An example of this mixed message effect is Nigeria. A governmental source claimed in 2011 that demand for passenger vehicles was 75 000 new and 100 000 used passenger vehicles a year (Jalal, 2011). In that same year the very same government source said in a different forum that that the numbers were in fact 80 000 new and 200 000 used per annum (Opara, 2011). Three years later industry sources claim 500 000 cars were imported in 2014, of which 40 000 or 50 000 were new, depending on which industry representative you are asking (Cockayne, 2014; OICA, 2014). This is disputed by port operators who in 2014 stated that Nigeria imports 800 000 vehicles a year with less than 80 000 of these being new (Airahuobhor, 2014). The variety of figures creates a confusing and inconsistent picture, and suggests that figures are being manipulated for the benefit of whichever interest group is promulgating them.

Historical Trends in Vehicle Supply

The newly independent governments of SSA embraced automotive industries under import substitution policies as a route to development. This meant that by the 1970s automotive assembly industries had appeared in South Africa, Zaire, Nigeria, Ghana, Ivory Coast, Madagascar, Angola, Tanzania and Zambia (Lall, 1980: 793). In a region long mired in poverty, capturing the welfare gains associated with the free trade in vehicles, as described by Grubel (1980) and quantified by Cleridies (2003), trumped industry protection in the eyes of global institutions. As such under SSA's 'structural adjustment' programmes of the 1980s these industries had their protection stripped away and the sector was opened rapidly to free trade. Almost all automotive industries in SSA could not compete with the enormous flows of low cost, used vehicles that came to dominate domestic markets and so shut down (Pelletiere and Reinert, 2002; Beuving, 2006a: 24).

The passenger vehicles which began to flood into SSA from the late 1980s onwards are sourced mainly from developed countries. In many of these countries, policies exist to encourage vehicle scrapping and generate new vehicle purchases. The most famous of these is the Japanese 'shaken' policy, where a car requires a costly examination after three years in order for it to be allowed to remain on the road (Clerides, 2008: 324). Many owners instead opt to purchase a new car rather than paying for the inspection (Clerides, 2008: 324). Boosting domestic motor vehicle production is not the only motivation for scrappage policies. In the EU, Canada and the US there have been policies to encourage consumers to replace old cars with newer less polluting new cars (Schiraldi, 2011: 287). This partnered with limited domestic demand for older models means that relatively good quality used vehicles flow to the developing world at low prices.

Poor quality used vehicles also contribute to the flow of vehicles into the developing world. The European Union, Japan and Korea all have strict rules governing the disposal of ELVs to limit environmental damage and dumping (Sakai et al., 2014). The safe dumping process is complex and costly, meaning the recycled materials extracted from the process seldom cover the costs of their removal and the safe disposal of the unrecyclable materials (Schneider et al., 2010: 39). A more profitable exercise for many is to illegally dump ELVs by exporting them to SSA and other developing regions (Fuse, Nakajima & Yagita, 2008; Schneider et al., 2010: 8 & 39; Sakai et al., 2014: 3). Older vehicles from developed countries are often then eventually exported as very low cost, low quality vehicles when they are no longer roadworthy in the original market.

SSA is best viewed as having de facto regional markets rather than individual national markets. This is because of the fluidity of many country's borders, due to endemic smuggling (Fadahunsi & Rosa, 2002; Golub, 2012). Importers bring used cars into the region through countries which have the lowest tariffs, shipping costs or where there are no strict age limits on used car imports (Beuving, 2004: 512; Brooks, 2012: 83). After entry the cars are then transported on to their actual sale destinations, which may involve the legal or illegal crossing of national borders (Fadahunsi & Rosa, 2002: 414 & 415; Brooks, 2012: 85). Bribes to customs officials and smuggling mean that large amounts of invoicing are either incorrect or missing, making accurate trade statistics a challenge. However, most cars are imported into the general region of their final destination nation, even if they are initially delivered into another country (Beuving, 2006a; Brooks, 2012).

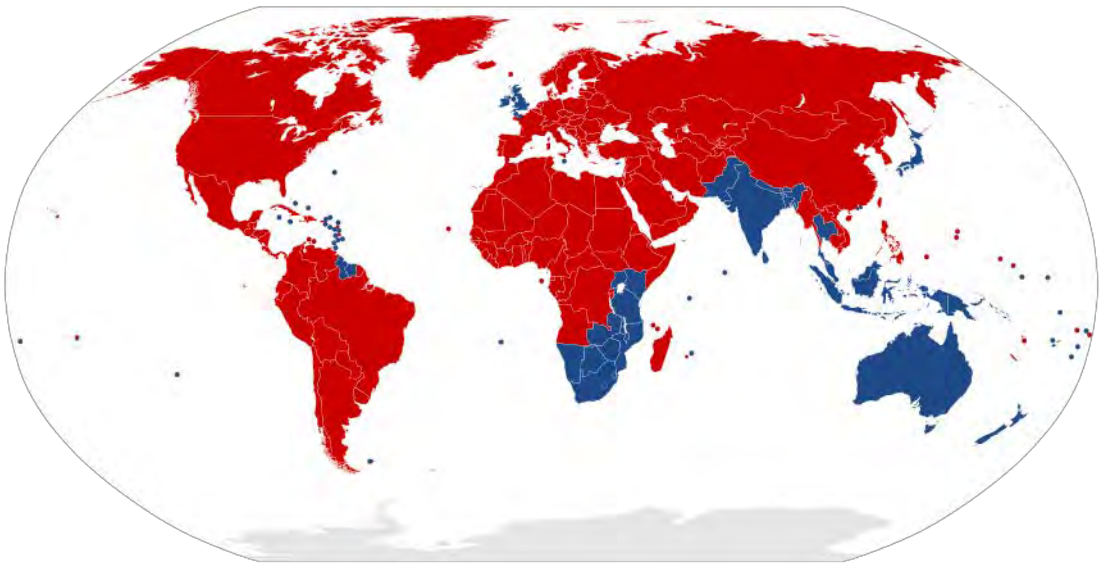
The three general regions for imports are: Western, Eastern and Southern Africa. Each has developed their own networks of used and new car trade, which are closely linked to which side of the road they drive on (Pelletiere & Reinert, 2006, 2010). In West Africa where all countries are left-hand drive (Figure 1) imports are predominantly from the left-hand drive countries of Western Europe and to a lesser extent the United States (US) (Beuving, 2006b). Imports are channelled through the major ports of Cotonou in Benin, Lome in Togo and Lagos in Nigeria (Beuving, 2004: 511–512, 2006a: 5).

In Southern Africa, Durban in South Africa is the main port used to supply the region, along with Walvis Bay in Namibia (Brooks, 2012, p.83; Kaira, 2014). However, South Africa has banned used cars being driven through it destined for other countries and Botswana has done the same, requiring them instead to be transported on trucks which is more costly (Kaira,

2014). As a result, some Southern African countries are shifting to East African supply routes (News Day, 2014). The imports for Southern Africa, predominantly right-hand drive nations, are sourced directly from Japan and to a lesser degree the Middle East (Brooks, 2012; Lester 2015)

The East African car trade has been comparatively less investigated by researchers. It appears East Africa also mainly relies on flows from Japan and the Middle East, possibly with the Middle East having a larger role than in Southern Africa (Sander, 2004; UN Comtrade, 2015). Imports from the Middle East are most probably re-exports from right-hand drive Japan as the Middle East is predominantly left-hand drive. Unfortunately how passenger vehicles are channelled through East Africa has not been thoroughly researched. Interestingly, in 2005 Fuse et al (2009) estimate that Uganda accounted for 1% of global used car exports in 2005 (Fuse, Kosaka & Kashima, 2009: 355). More recent trade statistics also rank Uganda as one of the larger SSA vehicle exporters, with exports predominantly flowing to its neighbours (DESA/UNSD, 2015). Uganda has 0% tariffs on used vehicle imports, which is lower than most of its neighbours, possibly making it an attractive export destination for tariff dodging regional re-exporters (UNCTAD, 2015). Research into smuggling in the region has focused on vehicle parts rather than vehicles themselves but shows Uganda to be a hub in that traffic, especially in moving goods to the Democratic Republic of Congo (DRC) and South Sudan (Ackello-ogutu, 1996; UBOS, 2012).

Figure 1: Left-Hand and Right-Hand Drive Countries



Source: Benjamin D. Esham 2007
*Red indicates left-hand drive and blue right-hand drive.

The flow of used cars into SSA is largely informal with two major types of traders involved in facilitating their import and sale. Trading used vehicles is capital intensive and so members of trader families generally pool resources, operating as a unit (Beuving, 2006a; Brooks, 2012: 83). From immigrant communities in SSA there have emerged families who have are able to import large numbers of vehicles for resale (Brooks, 2012: 83). These traders often

have established connections with used car exporters in the developed world, having traded in their home countries before moving to SSA (Brooks, 2012: 83). In some cases these groups have been able to amass political power and wealth and capture more valuable nodes in the trade of used cars. The most successful of these are Pakistani families who arrange logistics for cars out of Durban and Lebanese families controlling the shipping of vehicles into West Africa (Beuving, 2006a: 84; Brooks, 2012: 86).

The other group of used vehicle traders are locals from SSA who arrange for the import of cars from one of the used car export hubs to their home market. These traders also often make use of familial networks. Commonly family members are sent to live in diaspora communities at vehicle export hubs, they then select cars to send back to be sold by other family members in their country of origin (Beuving, 2004, 2006a: 84–86). While some of these traders are also able to import substantial numbers of cars, it is not limited to large scale operators with even students studying abroad regularly sending a few cars a year home for their family to sell (Fadahunsi and Rosa, 2002: 413; Beuving, 2004: 524, 2006b). This group does not typically control the more profitable nodes of the trade outside of SSA, but may do so within SSA. In Benin for instance, a Yoruba[17] cartel controls the majority of the used car markets and claim a percentage of all sales, a more profitable position than selling the cars themselves (Beuving, 2006a: 33).

The networks of smuggling and corruption in the used car trade are entrenched and contribute significant wealth to those involved (Benjamin and Mbaye Aly, 2012).[18] In West Africa the majority of smuggling is used to move cars into Nigeria from Benin and Togo where import costs are lower and regulations looser (Fadahunsi and Rosa, 2002; Beuving, 2006a; Golub, 2012). Fadahunsi and Rosa (2002) note that smuggling is so common in the region that on Benin's border, workshops for producing forged Nigerian license plates and registration documents operate openly (Fadahunsi and Rosa, 2002: 421). In parts of Southern Africa, systems of high tariffs and duties encourage corrupt border officials to give used cars below market valuations, and thus lower duties (Brooks, 2012: 86). In Mozambique an attempt to challenge this system led to the murder of the government official spearheading the investigation (Brooks, 2012: 87).

Establishing a Market Estimate

The informal nature of much of the used car trade, the difficulties of accounting for smuggling and weakness of some countries' trade reporting all create significant barriers to estimating the size of the light vehicle market in SSA. Some clarity was provided by Fuse et.al (2009). They use multiple databases and correct for the errors using methods established by Tsigas et.al (1992), to estimate the global trade in used vehicles in 2005. This approach was able to yield possibly the most accurate account of the global trade in used vehicles. While imports of used vehicles are spread quite evenly throughout the globe, exports are concentrated in a just a few countries (Fuse, Kosaka & Kashima, 2009: 355). The major high-income vehicle producing regions, the EU, US and Japan, accounted for a minimum of 85%

[17] The Yoruba are an ethnic group who are present in both south-western Nigeria and southern Benin.
[18] Some estimates place the used car trade, with its illegal elements included, as contributing around 10% of Benin's GDP (Benjamin & Mbaye Aly, 2012: 202–204).

of all used car exports in 2005 (Fuse et. al, 2009: 355). All three report new and used vehicle exports separately in their trade statistics and have taken active steps, since the early 2000s, to counter grey areas of trade (Fuse, Nakajima and Yagita, 2008: 2437; Fuse et. al, 2009: 355; Schneider et al., 2010).

The Eurostat Comext Database, Japanese Customs and Tariff Bureau and US International Trade Commission datasets are then able to give the best account of global used vehicle flows. However, even these datasets are still prone to the inaccuracies resulting from smuggling and under-valuation which occur once vehicles have entered SSA. As such it is best to still view SSA at the regional level and trade statistics on a quantity not value basis. The most reliable data source for imports from countries other than Japan, the US or EU is to use the mirror data from the UN Comtrade database and count their exports as SSA's imports. While the UN Comtrade dataset is not perfect[19] it does allow for a general picture of the annual market for passenger vehicles in SSA to be established. Its greatest explanatory power is in identifying the general trends in the data.

Light Vehicle Market Estimate for SSA

The types of light vehicles for personal use are passenger vehicles and light commercial vehicles (LCVs).[20] Of the two, passenger vehicles are a much bigger market in SSA and have clearer associated reporting. LCVs for personal use are more difficult to isolate in trade statistics, since a LCV with purely commercial applications, such as a small refrigerated van, is indistinguishable from any other LCV in its weight class, such as a pickup. While LCVs are currently portrayed as the vehicle of choice in SSA consumer surveys and industry interviews suggest that this is not actually the case. It is rather comfortable, safe and exclusive passenger vehicles that are desired and compact passenger vehicles that are purchased (Narteh et al., 2012; Sedzro et al., 2014; Lester, 2015). As such while LCV market estimates are given, in-depth analysis focuses on passenger vehicles.

An initial estimate suggests very rapid growth in vehicle demand in SSA. In the 10 year 2003-2013 period, the light vehicle market in SSA grew at a compound annual rate of 10.9% and in SSA excluding South Africa grew at 14.1%. Growth was slowed by the 2008-2009 financial crisis but has recovered quickly and seems to be returning to its pre-crisis levels. Excluding South Africa, in the three year period of 2003-2006 annual growth was 22.7% and for the three years of 2010-2013 it was marginally lower at 19.7%. The LCV market outside of South Africa was growing at 8% per annum for the 2003-2013 period, compared to 15.1% per annum for passenger vehicles. The slower growth rate from a smaller base market has led to LCVs losing ground to passenger vehicles. In 2003 LCVs accounted for 19% of the non-South African light vehicle market in SSA and in 2013 this had dropped to 11%.

Table 4: Approximate Market for New and Used Passenger Vehicles & Light Trucks (000's)

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011*	2012*	2013*

[19] For an explanation of the issues with UN Comtrade data see Appendix C.
[20] For how these categories are defined refer to Appendix C.

SSA	Passenger Vehicles	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**	**1141**	**1454**	**1690**	**1547**	**1465**	**1381**	**1760**	**1984**	**2180**
Excl. South Africa	Passenger Vehicles	339	406	463	584	825	856	866	787	1 068	1 214	1 388
	Light Trucks	79.3	67.7	87.8	188.2	226.5	191.8	223.3	123.6	146.7	174.5	172
	Total	**419**	**474**	**551**	**773**	**1051**	**1048**	**1089**	**910**	**1214**	**1388**	**1561**

Source: UN Comtrade; Eurostat Comext Database; Japanese Customs and Tariff Bureau; US International Trade Commission; Central Statistics Office Botswana and OICA
*South Africa only started to report its BLNS exports post 2010, for methodology description see Appendix B.

The fact that some of the largest importers in 2013 were small countries, such as Benin and Togo, supports the finding that vehicle smuggling is widespread. Benin, imported 330 868 passenger vehicles in 2013 making it the third largest SSA importer and placing it far above countries of comparable population and income. To get an estimate of a country's market size then requires an adjustment for smuggling. Golub (2012) calculates that at least 95% of Benin's imports and 85% of Togo's are re-exported legally and illegally (Golub, 2012: 1155). The vast majority of these vehicles are destined for Nigeria, with the alternate smuggling destinations of Niger, Mali and Burkino Faso consuming the rest. Using these statistics a viable estimate of the Nigerian market can be crafted by adding 85% of Benin's imports and 75% of Togo's to Nigeria own imports. That 85% and 75% of Benin and Togo's imports respectively end up in Nigeria may well be an underestimate as these numbers do not include completely unrecorded smuggled vehicles (Beuving, 2004; Assamoi & Liousse, 2010; Golub, 2012). It is estimated that 5% of Benin's imports ultimately end up in Niger, the second largest destination for smuggling and re-exporting. South Africa's import figures are of little assistance for market estimation, since it is both a producer and importer. As such South Africa's market is known from the official sales figures rather than import data.

The major exporters of passenger vehicles to SSA are as the literature suggests, with the EU, US and Japan accounting for on average 73.3% of exports over the 2003-2013 period. India has risen spectacularly as a source of cars for SSA. Exports to SSA grew at a compound annual rate of 50.4% between 2003 and 2013 resulting in total growth of 5901% over the period. India now accounts for 13.6% of all SSA imports, mostly to South Africa and Nigeria.

Table 5: Top 10 New and Used SSA Passenger Vehicle & LCV Estimated Markets, 2013

Passenger Cars		LCVs	
Nation	Market Estimate	Nation	Market Estimate
Nigeria	706 619	South Africa	169 262
South Africa	450 440	Nigeria	31 823
Ghana	92 135	Namibia	15 068
Kenya	62 751	Kenya	14 845
Niger	51 124	Ghana	12 932
Tanzania	36 191	Mozambique	9 072
Angola	33 156	Angola	8 758
Botswana	31 122	Zambia	7 833
Cameroon	30 622	Zimbabwe	6 876

Guinea	29 219	Uganda	6 404

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

LCV demand is dominated by the South African market which accounted for on average 51.8% of the SSA market for LCVs in the 2003-2013 period. In South Africa LCVs account for 27% of the new light vehicle market and in Nigeria a tiny 4% of the total light vehicle market. Crucially, even used LCV imports are expensive and so compete with similarly priced new or very high quality used vehicles. These vehicles are often more attractive than LCVs to the urban middle class who are the majority of purchasers. LCVs are unpopular in the EU and Japan, which have the most established used vehicle export links to SSA. This restricts the supply of relatively cheaper LCVs to the region. South Africa is the largest exporter of LCVs into SSA as it is a production hub for a number of OEMs' LCV models. The other large exporters mostly sell used LCVs, for example 83% of Japan's 2013 LCV exports were for used vehicles.

Table 6: Top 10 New and Used Passenger Vehicle & LCV Exporters to SSA, 2013

Passenger Cars		LCVs	
	Number Exported		Number Exported
EU	764 848	South Africa	62 249
US	248 906	EU	60 251
Japan	248 030	Japan	50 449
India	242 135	Brazil	17 578
Korea, Rep.	71 305	China	12 176
Switzerland	47 712	India	8 952
Canada	36 688	Thailand	7 667
South Africa	32 593	Korea, Rep	7 069
Australia	26 564	Switzerland	6 256
Thailand	16 150	Argentina	4 055

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

The regional[21] market is dominated by West Africa, driven by Nigeria and Southern Africa where South Africa accounts for the lion's share of the light vehicle market. East Africa as a whole accounts for less vehicles than are imported directly to Nigeria and Central Africa in turn imports around the same number as Kenya.

Table 7: SSA Passenger Vehicle Markets, 2013

Region	Total Market*	Percentage Shares	Shares (Excluding South Africa)
West Africa	989 199	53.8%	71.2%
Southern Africa	611 364	33.2%	11.6%
East Africa	172 772	9.4%	12.4%
Central Africa	65 754	3.6%	4.7%

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

*Includes all new and used passenger vehicles

[21] Countries are divided into their regions using the African Development Bank's classifications; see Appendix D for a detailed breakdown.

West African passenger vehicle imports drive EU and US exports into SSA. West Africa accounted for over 85% of the EU's used passenger vehicle exports and 95% of the US's in 2013. US used passenger vehicle exports have grown at a rapid compound annual rate of 41.2% per annum for the 2003-2013 period. Southern and Eastern Africa dominate Japan's used passenger vehicle exports to SSA, accounting for 48.1% and 43.2% respectively in 2013, with just six countries accounting for 81.1% of all imports. These countries, from largest to smallest importer, are: Kenya, South Africa, Tanzania, Uganda, Zambia and Mozambique. As South Africa does not permit the import of used vehicles its inflows are all for re-export. These trends are as expected with right-hand drive countries exporting to right-hand drive regions and left-hand drive to left-hand drive.

Motorcycle Imports into SSA

Table 8: Total Imports of New and Used Motorcycles (000s)

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
SSA	1 238	1 428	1 788	2 052	2 578	3 199	2 347	2 708	4 099	3 250	3 849

Source: UN Comtrade

Table 9: Top 10 New and Used SSA Motorcycle Importers, 2013

	Number of Imported Motorcycles
Nigeria	1 370 177
Togo	474 237
Angola	343 102
Guinea	240 475
Kenya	173 147
Mali	161 277
Tanzania	158 775
Congo, Dem. Rep.	120 017
Ghana	104 164
Benin	99 531

Source: UN Comtrade

As there is some domestic production of motorcycles imports are not as strong a proxy for market size as light vehicle imports, but they do give an indication of demand. Motorcycle imports unsurprisingly suggest that there is a much larger market for motorcycles in SSA than for light vehicles. Again Togo and Benin import too many motorcycles for countries of their population and income, again suggesting that imported motorcycles are shipped across their borders, primarily to Nigeria. This is evidenced by the fact that Cote d'Ivoire, another coastal West African country, both more populous and with a higher GDP per capita than either Togo or Benin imported only 38 383 motorcycles in 2013 and Cameroon which is

more populous and wealthier still imported 61 181.[22] It is reasonable then that imports for the domestic markets in Benin and Togo can be generously estimated as 50 000 motorcycles a year with most of the imports above that level smuggled into Nigeria. If this is the case then Nigerian imports are in the region of 1.75 million motorcycles a year. Only five countries have domestic markets that are larger than Nigeria's imports alone, namely: India, China, Indonesia, Vietnam and Thailand (King, 2013). This suggests the potential to grow domestic production significantly.

Over 95% of motorcycles shipped to SSA come from either China or India, with China representing 70% of total imports. Japanese exports are a distant third and 75% of these are used bikes, mostly destined for Nigeria. China's large scale exports to SSA are due to it having widespread market penetration in the region, it manages to export over 50 000 motorcycles a year to no less than 13 SSA countries. India by contrast concentrates its exports in a few countries. Over 50% of India's total exports are destined for Nigeria and India only exports over 50 000 motorcycles a year to three other SSA countries. It is only in East Africa that India approaches the kind of market penetration that China has continent wide. However, India's second biggest export destination, Kenya, still imports more motorcycles from China.

Table 10: Top 10 New and Used Motorcycle Exporters to SSA 2013

	Number of Imported Motorcycles
China	2 806 479
India	883 133
Japan	63 224
Taiwan	27 423
Thailand	26 947
EU	22 992
Indonesia	7 093
United States	2 727
Vietnam	2 594
Singapore	2 216

Source: UN Comtrade

Table 11: Top 10 SSA Motorcycle Importers from China and India in 2013

China		India	
Nigeria	810 603	Nigeria	510 206
Togo	448 080	Uganda	82 792
Angola	278 866	Kenya	70 081
Guinea	197 583	Angola	56 517
Mali	158 517	Guinea	41 995
Tanzania	127 439	Tanzania	30 164
Congo, Dem. Rep.	107 118	Sierra Leone	12 341
Kenya	101 890	Congo, Dem. Rep.	10 715
Benin	96 976	Ethiopia	10 596
Mozambique	91 602	Congo, Rep.	10 351

Source: UN Comtrade

[22] The 2014 GDP per capita for Togo, Benin, Cote d'Ivoire and Cameroon respectively were: $646, $825, $1 646 and $1 426 (World Bank, 2015). The 2014 populations for Togo, Benin, Cote d'Ivoire and Cameroon respectively were: 7, 10.6, 20.8 and 22.8 million (World Bank, 2015).

Motorcycles imported into SSA, almost all are of the small 'workhorse' variety with 99% of imports having below 250cc engine capacity.

Table 12: Breakdown of Motorcycle Types Exported to SSA 2013

Type	Percentage of total Imports
Under 50cc	4.85%
Over 50cc and under 250cc	94.17%
Over 250cc and under 500cc	0.13%
Over 500cc and under 800cc	0.14%
Over 800cc	0.17%
Other	0.53%

Source: UN Comtrade

New Light Vehicle Market Estimate SSA

The general flows of light vehicles and motorcycles into SSA show the huge growth in demand for low cost private modes of transport. However, these flows do not give any insight into how SSA's growth has affected demand for more expensive new light vehicles, which are the vehicles that any domestic industry would produce. As the US, EU and Japan account for almost 75% of total imports they can give a fairly powerful insight into the trends in the proportionality of used and new passenger vehicle imports within total imports.

Table 13: New and Used Passenger Vehicle Exports from the EU, US and Japan to SSA

Year	Total Exports to SSA			Exports to SSA Excluding South Africa		
	Used	New	Ratio (Used : New)	Used	New	Ratio (Used : New)
2003	224 170	143 271	1.6:1	194 249	54 993	3.5:1
2004	301 547	185 975	1.6:1	268 030	53 516	5.0:1
2005	305 113	232 371	1.3:1	272 751	53 172	5.1:1
2006	344 730	291 437	1.2:1	315 677	79 644	4.0:1
2007	528 891	297 263	1.8:1	498 972	97 042	5.1:1
2008	557 842	221 094	2.5:1	524 420	87 064	6.0:1
2009	559 818	141 688	4.0:1	513 146	51 027	10.1:1
2010	621 531	198 985	3.1:1	566 668	58 074	9.8:1
2011	781 824	206 282	3.8:1	714 335	58 160	12.3:1
2012	983446	212 641	4.6:1	935 233	59 883	15.6:1
2013	1 027 927	233 857	4.4:1	977 505	64 496	15.2:1

Source: Eurostat Comext Database, Japanese Customs and Tariff Bureau and US International Trade Commission

New passenger vehicle exports to SSA from Japan, the EU and US have been growing at a much slower rate than their exports of used passenger vehicles, with a compound annual growth rate of 5.2% for new versus 17.2% for used cars in the 2003-2013 period. South Africa accounts for both the largest quantities and fastest growth in new passenger vehicle imports from Japan, the EU and US. Without South Africa, it seems that there is barely any growth in the new passenger vehicle market in SSA for traditional producers. New passenger vehicle exports experienced a compound annual growth rate of only 1.6% per annum in the

2003-2013 period, from a very small base. The biggest new car destinations are similar to the largest total markets with six of the same countries amongst the 10 largest of both. Most of the countries which are large new car importers but not overall markets are relatively small, wealthy countries. The new passenger vehicle market in SSA is then either very small, which is what was expected, or else possibly new vehicles are imported from production sites in the developing world.

Table 14: Top 10 SSA Importers of New Passenger Vehicles from EU, US and Japan, 2013

	Number Imported
South Africa	169 361
Nigeria	19 671
Benin	8 014
Angola	7 683
Ghana	5 997
Mauritius	2 628
Senegal	2 136
Kenya	2 036
Cote d`Ivoire	2 009
Gabon	1 644

Source: Eurostat Comext Database, Japanese Customs and Tariff Bureau and US International Trade Commission

An alternate measure of the new passenger vehicle market in SSA is to use the data provided by Organisation Internationale des Constructeurs d'Automobiles (OICA), which is the global federation of automobile manufacturers. Their figures are derived from sales or new registration data from their members. Most OICA figures are estimates but if accurate they suggest that the flow of new cars into SSA is not fully accounted for by trade data from the EU, US and Japan. This means that developing world producers could well be a major supplier of new vehicles to SSA, just as South Africa is the largest new LCV exporter into the region.

Table 15: Producer Figures of the Top 10 New Car Sales Nations in SSA 2013

	Passenger Cars Sales
South Africa	450 561
Nigeria	40 000*
Botswana	31 122
Angola	20 000*
Reunion	19 465
Mauritius	7 500*
Ghana	6 600*
Cote d`Ivoire	4 000*
Senegal	4 000*
Tanzania	3 500*

Source: OICA Sales Data, *represents an estimate

The other major exporters to SSA must then not be ignored. Some of these countries, such as Canada, Switzerland and Australia mimic Japan, the EU and US quite closely with their export destinations and are not very large scale domestic producers. As such they are expected to export mainly used cars. South Africa and Korea have exports which are a mix of used and new vehicles. Industry figures show that South Africa exported 78 787 new vehicles of all categories to SSA in 2013, while trade statistics show that South Africa exported

94 842 passenger vehicles and LCVs into Africa in the same year (Lamprecht, 2015: 39). The difference between the two figures is from South African re-exports of Japanese used vehicles. However, some markets are certain to be purely new vehicle exports, such as those which drive on the opposite side of the road to Japan or are far enough away from Durban that using a local port is more cost efficient. For example, passenger vehicles destined for West and East Africa from South Africa are almost certainly new as either cheaper, left-hand drive, used cars can be accessed from the EU or else transport costs from Durban would not justify Japanese used vehicle imports.

Korea is also both an exporter of new and used vehicles, as it has developed a used vehicle surplus has appeared and recently shipping links have emerged to export these exports to SSA (Nieuwenhuis et al., 2007: 20). However, the sale of new Kia and Hyundai passenger vehicles have also seen significant increases experiencing over 100% market share growth in some SSA markets. Interviews with industry experts have all emphasised the growing popularity of new Korean vehicles.[23]

Exports from India and Thailand to SSA are also considerable. Both India and Thailand are developing countries which have highly productive automotive industries and protected used vehicle markets. This makes them cheap producers of new passenger cars, with surplus domestic demand for second hand vehicles as the GDP per capita is far below the threshold needed for new vehicle purchase (Pelletiere, 2003: 141–143; Clerides, 2008: 324). It is then more profitable to sell used vehicles domestically in these countries than shipping them to SSA for sale. With this in mind it is most probable that all exports from developing producers with protected used vehicle markets are new vehicles. This suggests the possibility of larger flows of new cars into SSA than previously thought.

South Africa, which prohibits used car imports, is the largest importer from India followed by Nigeria. The scale of Indian exports to South Africa and Nigeria is surprising and has grown at rapid compound annual rates of 72.9% and 60.1% respectively for 2003-2013. The trend in both countries has been very similar, growing from just 455 vehicles for South Africa and 852 for Nigeria in 2003 to 108 683[24] and 94 084 respectively in 2013. These large import figures are used by some to indicate that Indian producers have managed to penetrate the passenger vehicle market in SSA more successfully than other producers having developed products which can compete with used vehicles (Freemantle and Stevens, 2012). The problem with Indian exports to SSA is whether they are actually exporting passenger vehicles or other products mistakenly classified as such. Breaking down Indian exports, 96% of South African imports are vehicles of more than 1000cc capacity. In Nigeria it is instead vehicles of a cylinder capacity not above 1000cc[25] which account for nearly 95% of imports.

The below 1000cc category of passenger vehicles is a niche in which Indian firms have traditionally excelled, producing very low cost, small vehicles which have come to dominate their large domestic market. Additionally, OEMs have recognised both the Indian market size

[23] Interviews with Craig Parker, a Senior Consultant at Frost & Sullivan and Michael Lester, Chair Africa Export Forum, informed general automotive trends in ownership, aspirations and sales in SSA.
[24] India's reported figures are slightly larger than the 95 964 light vehicles that South Africa reports to have imported from them in 2013 (NAAMSA, 2014).
[25] HS Code 870321

and producer capabilities in this product range and located global production of their small models in India. For example, Hyundai locates all its production of compact cars in India and uses the country as an export base to emerging markets, explicitly targeting Africa (Thakkar, 2014). Hyundai was India's largest vehicle exporter in 2013 and is a brand popular with SSA consumers (Chauhan, 2014). It is then conceivable that India produces the right product for SSA and is exporting new vehicles in previously unthinkable volumes. However, the big counterfactual for this is that auto-rickshaws are reported in the 1000cc vehicle category by India and demand for these is booming across SSA and Nigeria in particular. Countries in SSA either import above or below 1000cc vehicles suggesting differentiated producers and products aiming at different markets supporting that they are in fact proxies for auto-rickshaws and passenger vehicles. This seems a more likely explanation for the export statistics than enormous new passenger vehicle demand.

Adding imports from Thailand, India[26], China, Turkey and Indonesia[27] to the known new passenger vehicle import numbers creates quite a different picture of the new passenger vehicle market in SSA. Due to uncertainties about the composition of South Korean and South African exports to SSA there are upper and lower bounds for the market estimates.

Table 16: SSA New Passenger Vehicle Estimated Markets excluding South Africa, 2013

	Lower Estimate	**Upper Estimate**
Nigeria	31 059	41 779
Angola	17 599	23 482
Ethiopia	2 027	2 596
Ghana	8 770	12 595
Benin	8 071	8 112
Tanzania	1 542	1 632
Mozambique	5 824	6 277
Kenya	4 456	4 628
Mauritius	4 096	5 401
Cote d'Ivoire	2 656	4 004
Total	104 346	133 220

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

Adding the upper estimate for Nigeria to an estimate of those smuggled from its neighbours[28] and South Africa's LCV exports then Nigeria's new light vehicle market stands at 59 903 vehicles. This is nearly 50% greater than industry estimates for new vehicles. Likewise in countries like Angola and Ghana, when combining the upper estimate with South Africa's LCV exports they could have markets 38% and 127% respectively above industry estimates. However, even assuming all Korean imports are new and adding South Africa's LCV exports the estimated new light vehicle market for the entirety of SSA, excluding South Africa, is a trifling 195 469 vehicles a year.

[26] Excluding all below 1000cc vehicle exports.
[27] China, Turkey and Indonesia are the 11th, 12th and 13th largest exporters to SSA and also do not have domestic used car surpluses.
[28] Assuming the proportion of imports smuggled for new vehicles is the same used vehicles.

Current Production in SSA

Africa as a whole accounts for less than 1% of global automotive production (OICA, 2015). This is due to there being only three nations with any substantial vehicle assembly or production. These are South Africa, Morocco and Egypt with only South Africa and Morocco having any degree of globally competitive scale. OICA estimates show the general lack of information about the sector. Even in relatively more developed countries, like Egypt, the estimates do not add up, making nonsensical official figures (Table 16). What is clear is that there is next to no large scale production on the African continent and in SSA it is confined entirely to South Africa.

Table 17: Production and Assembly in Africa, 2014

	All Vehicles	Passenger vehicles	Light Commercial Vehicles	Heavy Commercial Vehicles and Buses
South Africa	566 083	277 491	255 629	32 963
Morocco	231 986*	209 999	21 987	
Egypt	27 020*	17 542		24 973*
Kenya	3 080*			
Tunisia	1 860*		1 860	
Algeria	1 244	1 244		
Zimbabwe	829*			

Source: OICA Production Data, *represents an estimate

Established National Industries and Clusters

As the potential for an automotive industry in SSA outside of South Africa is the focus of this dissertation, South Africa's production policies and history are not central. However, as the only country in SSA which has established an automotive industry it cannot be ignored. This is especially because new producers in the region will have to either compete or cooperate with South Africa when attracting investment. The South African experience in and of itself is not particularly useful, as SSA is in a fundamentally different position from South Africa when it was establishing its industry due to the now globalised automotive industry.[29] To understand how South Africa developed an automotive industry and the current role South Africa plays in the global industry an historical perspective is required.

Black (2001) gives an account of the South African automotive industry and its development. In the 1920s assembly first began to occur under highly protectionist policies. Protection encouraged diversified assembly and local content requirements were stepped up from the 1960s to encourage localisation of component production. However, the low volumes of assembly across a wide range of makes and models meant that economies of scale were not being achieved. Cost structures remained high, making the industry internationally uncompetitive. The South African government sought to raise the industry's competiveness through increased international exposure from 1989, launching the Motor Industry Development Programme (MIDP) which formalised this process in 1995.

[29] The South African industry is close to 100 years old and was at one point the largest developing world assembler.

The exposure was to drive a rationalisation of the industry concentrating it into more competitive producers who would export from South Africa. The rationalisation and export focus was encouraged with a policy which allowed exporters to claim rebates on import duties for FBU vehicles. In 2013 the Automotive Production and Development Programme (APDP) replaced the MIDP, stabilising tariffs at 25% and providing a production incentive. The effect of the MIDP and the more recent APDP has been rapid structural change and integration into global value chains for South African automotive firms (Black & McLennan, 2015). This is shown in the passenger vehicle and LCV sectors, where in 2014 South Africa exported 51% of production and imported 58% of the domestic market for these vehicles (Lamprecht, 2015: 21).

Benabedjil et al. (2015) give a thorough analysis of the only other large scale producer in Africa, Morocco. It arose not due to any domestic demand but rather as an enclave of low cost production of mass market Renault vehicles, their Dacia platform, for the European market. The plant exists purely as an export orientated operation. Its location in Morocco is due to combination of factors. Firstly the current plant for Renault's Dacia vehicles is based in Romania and has grown overly large due to unexpected popularity of the vehicles. Secondly, the plant in Romania is facing increasing upwards wage pressure from its workers and the sustainability of long term low cost manufacturing is questionable. Thirdly, due to free trade agreements and geographic proximity the Moroccan government was able to bid on equal terms with EU member states to host the factory. Finally, an extremely generous incentive package was presented by the Moroccan government to Renault to encourage location of the plant in the country. All this is not immediately replicable by SSA nations, as they often lack comparable free trade agreements, geographic proximity and human capital. However, Egypt is attempting to do something similar and create enclaves producing for the Middle East and North Africa. So far it has attracted investments from a number of Chinese firms, such as JAC Motors, Geely, Foton and Great Wall Motors to this end (Chao, 2014; Gasnier, 2014).

In SSA, outside of South Africa, what little assembly existed post the 1980s structural adjustments was confined to SKD/CKD kit assembly with minimal component production. There have been two notable industries that have failed more recently than the 1980s. Historically Zimbabwe had some automotive capacity. However, the implementation of the Economic Structural Adjustment Programme (ESAP) in the 1990s led to reduced protection and increased vehicle and component imports, all but destroying Zimbabwe's automotive industry (Black & Muradzikwa, 2004). Botswana's membership of the Southern African Customs Union (SACU)[30] allowed a group of investors to export SKD assembled Hyundai's to South Africa free of duties from 1995. However, Botswana's SACU membership also required it to adhere to the MIDP, which did not allow for SKD assembly. The plant was forced to upgrade to CKD assembly by 1998, requiring high levels of financing to do so. Production was short lived as due to financial issues with the holding company the firm folded and production stopped in 2004. Some of the component manufacturers have managed to continue to exist by exporting to South Africa (Black & Muradzikwa, 2004).

The two most significant industries to exist for any period of time in SSA outside of South Africa have been Kenya and Nigeria. Kenya has assembled SKD and CKD kits since the

[30] Whose members are: South Africa, Botswana, Namibia, Lesotho and Swaziland.

mid-1970s. Kenyan Vehicle Manufacturers Ltd, General Motors East Africa (GMEA) and Associated Vehicles Assemblers Ltd have assembled LCVs and HCVs for: CMC, DT Dobie, Nissan, Land Rover, Mazda, Iveco, Mercedes Benz, Mitsubishi GM and Toyota (Juma, 2013a). Peak production was in the mid-1980s and dropped substantially in the following years, only recently has growth resumed and annual output reached over 7 500 vehicles across all categories in 2013 (Juma, 2013a; Ligami, 2014). Nigeria historically had a relatively significant assembly industry with Peugeot and Volkswagen developing capacity to assemble 63 000 and 45 000 vehicles per annum respectively in the 1980s. Assembly declined over time with Peugeot assembling only 6 864 vehicles in 2010 and then closing its factory the following year, the last producer to do so (Chamberlain & Ede, 2013).

Outside of automotive assembly, some SSA nations have limited production capacity in aftermarket parts. These firms struggle to compete with Chinese and South African imports. This is because they cannot produce at a large scale and South Africa close enough to offset any geographic advantage for a firm producing within a domestic market. An exception to this is the Nnewi cluster in Nigeria. Nnewi is a well-established cluster of large, medium and small factories manufacturing automotive spares in southeastern Nigeria (Abiola, 2006: 4). It is referred to as the 'Taiwan of Africa' due to its historic links to Taiwan and automotive spare parts production. Links were built through traders initially importing large volumes of spare parts from Taiwan for the Nigerian aftermarket industry. This relationship slowly transformed as more successful Nigerian traders began importing Taiwanese production technologies and hiring their expertise to train Nigerian technicians to localize production and lower costs (Abiola, 2006: 4).

The cluster was also supported by its location within a culturally Igbo area, where long established bonds of trust in the community allowed for equipment, employees and importantly information to be shared amongst firms (Brautigam, 1997). The cluster produced 80% of Nigeria's spare parts when its production peaked in the 1990s, but the difficulties of doing business in Nigeria and cheap Chinese imports have eroded production (Abiola, 2006: 5). Almost all firms require generators, which account for a disproportionate level of firm expenditure, poor roads also make transportation of goods out of the cluster and materials into it difficult (Abiola, 2006: 16). The response to cheaper Chinese imports has been to increase the quality of Nnewi products, but this has only had limited success (Abiola, 2006: 21).

Emerging Industries and Clusters

There is currently no automotive industry of substance in SSA outside of South Africa, but this is something firms and governments are looking to change. Interviews suggest that even 10 years ago the idea that anywhere in SSA other than South Africa could ever have an automotive industry was seen as foolish in the extreme. However, as the 'Africa Rising' narrative has built up steam, driven by the rapid growth occurring in the continent, the idea of African automotive producers has begun receiving legitimate interest. Following this a number of firms have begun attempting to establish a presence in SSA outside of South Africa.

OEMs from developed nations operate mainly through partnerships with indigenous assemblers when they do have an assembly operation in SSA. There are long standing

relationships in Kenya and historical ties in countries like Nigeria where firms have previously operated. The local assembly partners of firms are often the local distributors of an OEM's vehicles which are then encouraged to invest in assembly if the OEMs view expansion into the country as feasible. As Ruigrok and Van Tulder (1998) found, firms are only interested in investing where they view there to be significant markets and supportive regulatory frameworks. This usually includes tariff differentials between FBU and kit vehicles of at least 35% (Reuters, 2014). As SSA changes so developed nation OEMs are expressing new interest in assembly in SSA. Interviews suggest the most active developed nation OEMs in SSA are: Nissan-Renault, Toyota, Hyundai, Kia and General Motors (GM).

Nigeria as the economic giant of West Africa and with a newly introduced automotive policy has attracted the most attention from OEMs. Nissan-Renault has partnered with the West African conglomerate, Stallion Group, which is also its local distributor (Abioye, 2013). This has meant that from early 2014 it was the first major OEM to assemble vehicles in Nigeria after the introduction of the new Nigerian Automotive Policy (Nissan, 2014). The Stallion Group assembly plant can assemble 45 000 SKD kits a year (Abioye, 2013). Hyundai is also partnered with Stallion Group and has its products assembled in the same facility as Nissan-Renault (Alu, 2014). Volkswagen is yet another firm partnered with Stallion Group (Smyth, 2015). Ford is partnered with Coscharis Group to assemble LCVs for Nigeria and possibly West Africa as a whole, importing the SKD kits from South Africa (Ohuocha, 2015; Bisiriyu, 2014a). Toyota's distributor in Nigeria also plans to shift to assembly by late 2015 (Ochonma, 2015). Finally Kia has established a plant to assemble 25 000 SKD kits per annum with local firm United Vehicle Assembly Ltd. (Bisiriyu, 2015).

These investments suggest the OEMs are following a very risk averse strategy by letting local conglomerates and distributors, who need to assemble cars to avoid tariffs, carry the bulk of the cost of setting up plants. It has also meant that all these assembly plants are for very rudimentary SKD assembly. As such, economies of scale become less relevant and the larger assemblers such as Stallion Group assemble a wide variety of makes and models. Other developed world OEMs are waiting to see how the market responds to the new automotive policy or assembling on an exceptionally small scale[31] (This Day live, 2015). Production in Nigeria is then almost entirely motivated by tariff avoidance and the OEM response suggests they view assembly as little more than a required cost that their distributors must bear.

Kenya is the largest producer in East Africa and has signalled that it wishes to grow its automotive industry. Kenya is pushing for common external tariffs in the EAC and trying to attract OEM investment (Olingo, 2014). To this end Nissan-Renault has expressed the desire to assemble for the EAC market in Kenya if the tariff protection against FBU imports is increased, although there is already a 25% differential between kit and FBU imports (Juma, 2013a; Reuters, 2014). Hyundai partnered in 2012 with Kenyan Vehicle Manufactures to assemble for the EAC market (Miyungu, 2014). The regional Toyota subsidiary, Toyota Tsusho, has focused on cautiously expanding in the established Kenya market. It dropped a takeover bid for Kenya's Associated Vehicle Assemblers (AVA) and instead partnered with them to assemble 40 Hino trucks and buses a month with the option to expand it to 200

31 For example Honda have retooled a motorcycle factory in Nigeria to produce 1 000 SKD kit vehicles a year (This Day live, 2015).

(Marete, 2013; Herbling, 2013). Toyota Tsusho has followed this by announcing its intention to invest in further assembly in the near future, if the EAC market is viable (Chai, 2015; Momanyi, 2015). GM doubled their Kenyan assembly plant's production from five units a day to 10 in 2013 (Juma, 2013b). If Kenya is successful in creating a common external tariff in the EAC and a more conducive customs regime then it is very well positioned to become the regional OEM assembler for the growing EAC market.

Nigeria and Kenya are by far the greatest focus of developed world OEM interest in SSA. Ethiopia, which has a highly protected very small market is the only other possible interest. Nissan has mooted plans to partner with their distributor in the Ethiopian market for small scale SKD assembly (Asfaw, 2013). Likewise, Hyundai are in negotiations with Marathon Motors, owned by famous runner Haile Gebrselassie, to establish a small SKD assembly plant (The Reporter, 2015). Other OEM's distributors assemble on such a small scale, so as to avoid tariffs, that it is irrelevant (Norbrook, 2011).[32] The only other developed world OEM plant of any size in SSA is a Hyundai SKD plant in Mozambique built with their local partners Somyong Motors assembling 4 500 vehicles a year from late 2014 (Mpofu, 2014). In SSA, outside the EAC or Nigeria, the prospects for developed world OEMs driving the establishment of a vehicle assembly industry at any level beyond very basic SKD processes seem unlikely.

Investment in SSA by Chinese firms establishing small scale SKD assembly plants has been more aggressive and far reaching than any of the developed world OEMs. This is symptomatic of general Chinese automotive investment strategies. The Chinese automotive sector has been increasing its level of outward direct investment (ODI) and since 2003 it has been the top sector for Chinese ODI (Amighini & Franco, 2013: 149). This has in turn made China the top investor abroad amongst developing nations in the automotive industry (Amighini & Franco, 2013: 149). Chinese investors target non-high income nations and invest mostly based on market size, regardless of stability or efficiency of labour markets (Amighini & Franco, 2013: 149). These investments are generally not a substitute for Chinese exports, but rather to actually support export activities, with the firms never looking to achieve anything beyond SKD 'screw driver' assembly while importing all components from China (Amighini & Franco, 2013: 150).

This strategy is an extension of China having concentrated on developing market dominance in producing automotive parts rather than FBU vehicles. While China has established itself as a major global player in components production, generating a substantial trade surplus, it is still in fact a net importer of FBU vehicles (Amighini, 2012: 329-331). Its strategy of overseas assembly is used to support its domestic components industry through multiple channels. Firstly, in highly protected markets, SKD assembly is often necessary if the market is to be accessed at all. Secondly, by providing local employment and investment, no matter how limited, the firms are able to secure political and popular support by marketing the vehicles as locally made. Finally, where cheap labour exists 'screw driver' assembly can allow for cheaper transport costs on a per vehicle basis, when roll-on roll-off shipping is not an option.

[32] For example a local distributor assembles around 200 Fiats per annum in his repair shop in Addis Abba (Norbrook, 2011).

As a result of this strategy Chinese investments or partnerships in assembly are either being investigated or implemented in: Cameroon, Ethiopia, Ghana, Nigeria, Senegal, Uganda, Tanzania, Zambia and Zimbabwe (Table 17). The firms investing include but are not limited to: Foton, Geely, Lifan, Great Wall Motors, Build Your Dreams, JAC Motors, Joylong, GAC MOTOR and Higer Bus. These investments are focused on either relatively large potential markets, such as Kenya, Uganda and Cameroon or else protected markets such as Ethiopia. In markets at the smaller end of the scale, such as Ethiopia and Uganda, most of the investments are true 'screw driver' plants which have capacities of only 1 to 2 thousand vehicles per annum in a vast range of models[33] (Bekele, 2012; Dyson, 2012; Fikade, 2013; Heuler, 2013; Gebreselassie; 2013; Chao, 2014; Bisiriyu, 2014b; Ochonma, 2014a; Balami, 2014; Weihua, 2014; Etyang, 2015; Farge, 2015). In the larger potential market of Kenya, Foton have a 10 000 units per annum LCV and HCV SKD assembly plant (Senelwa, 2012).

Nigeria is the focus of most Chinese firms' SSA expansion, much like developed world OEMs. In a similar fashion, the Chinese firms are partnering with local business groups, to assemble a wide range of makes and models. Interestingly some firms assembling Chinese automotive products claim to already be assembling CKD rather than SKD kits. These are by and large HCV and bus assemblers. By far the largest of these is the Nigerian firm R. T. Brisco, who are major vehicle distributors and claim to have capacity to produce 45 000 CKD kits a year of BYD trucks and busses (NADDC, 2015). Similarly Richbon Nigeria claims capacity to assemble 16 500 CKD kit Sinotrucks and 15 000 Xiamen King buses, while National Truck Manufactures claim to assemble 5 000 Sinotrucks CKD kits (NADDC, 2015). General Appliances West Africa is recorded as building a 6 000 unit capacity CKD assembly plant for BIGST SUVs and LCVs (NADDC, 2015). This all seems unlikely and since CKD assembly attracts half the tariff level of SKD assembly it is likely that the term CKD is being generously used by firms.

As yet no Chinese passenger vehicle assemblers state that their assembly will be of anything other than SKD kits. Unlike the HCV and bus plants that are typically for a single brand the Chinese light vehicle plants plan to produce a large range of brands and models. This means plants like Coscharis Group's, will assemble 15 000 SKD kits a year for Jinagsu Joylong, other Chinese brands as well as Ford (NADDC, 2015). Likewise Kewalram Group claims to be in the process of establishing a 15 000 SKD kits a year plant for Foton, Chery, JMC and others (Bisiriyu, 2014b; Ochonma, 2014a, 2014b; NADDC, 2015). How many of the proposed Chinese investments actually come to fruition is uncertain, but there is certainly significant interest in SSA from China's many vehicle manufacturers.

The rhetoric used to describe indigenous firms which have established themselves in SSA is highly problematic. There is very little critical questioning of the firms, instead media and the public are only too willing to accept fanciful claims of ingenuity, high local content levels and employment (Mensah, 2014; Ufford, 2014; Owusu, 2015; Mulupi, 2015).[34] Although many of the firms are genuinely impressive, it seems unlikely that any of them are the harbingers of SSA's industrialisation. The huge desire of the citizens of SSA to have a

[33] The largest operating actual plant is a 3 000 unit Lifan plant in Ethiopia (Weihua, 2014)
[34] For the full stories according to local and international media see Appendix F.

'Henry Ford' emerge in the region has encouraged enterprising businessmen to be painted as national heroes and in one case a messiah.

There are five 'indigenous' firms which have received the most media attention and made the most progress towards automotive assembly of any scale. They are: Innoson Vehicle Manufacturing (IVM) part of the Innoson Group in Nigeria; Mobius Motors in Kenya; Kantanka, which is controlled by the Apostle Safo Suaye Technology Research Centre (ASSTRC) in Ghana; Kiira Motors Corporation (KMC), funded by the state owned Uganda Development Corporation and Matchedje Motors in Mozambique. Additionally there are a number of indigenous firms which have either already failed, such as Holland Car[35] in Ethiopia, or else have no foreseeable way to produce anything beyond a handful of vehicles a year. These include the government supported efforts of TATC in Tanzania and the Karenjy in Madagascar (Karani, 2013; iol, 2014; Bekele, 2015).

Unfortunately, where the productive capacity for this assembly suddenly emerged from has not been investigated and owners' claims are heralded. This is especially important since both IVM and Kantanka claim to assemble CKD kits at very low volumes and use incredibly high levels of local content, 60% in the case of IVM (Abone, 2014; Ufford, 2014; Emmanuel, 2014; Vanguard, 2014; Yeboah, 2015). Interestingly, the vehicles produced by these indigenous firms have a more than passing resemblance to well-known Chinese brands (Figures 2-4). It would seem that rather than being the truly locally developed brands, they are locally owned, or co-owned, assemblers of rebadged Chinese vehicles.

Figure 2: IVM Carrier and GONOW New Fan Pickup

Source: Innoson Vehicle 2015; Alibaba 2015

Figure 3: Kantanka SUV and Foday Explorer 6

[35] Holland Car received much fanfare establishing an SKD plant in Ethiopia for Chinese vehicles. However, it did not deliver on 200 pre-purchased vehicles in 2012 and the owner fled the country, just three years after being declared Africa's SMME of the year (African Executive, 2009; Bekele, 2015).

Source: Kantanka 2015; Alibaba 2015

Figure 4: Matchedje Pickup and Foday F16

Source: Matchedje 2015; Alibaba 2015

The media campaigns of these firms have been so powerful that even respected news organisations like the BBC claim that these vehicles are "designed and manufactured" in SSA countries (BBC, 2015a). The reality is that an enterprising Chinese vehicle assembly company called the China Chongqing Big Science and Technology Development Group (BIG) has begun to export assembly plants from China.[36] They expressly target African countries, noting that Nigeria has "a very good policy" for their products, and will agree to a joint partnership if three requirements are met. These are: there must be a 30-35% differential in tariffs for FBU and SKD vehicles; the interested African party needs to contribute capital of $1 million and 10 000m^2 of land, of which 3 000m^2 is a workshop. BIG stresses that not meeting these requirements is not necessarily a deal breaker, interested parties should contact them anyway, especially if they have either experience in automotive sales or good relations with their government.[37] If a firm has greater resources they can buy a plant outright and then there are a plethora of Chinese firms willing to export kits and parts to them (Made-in-China.com, 2015).

[36] This section draws extensively from BIG's Overseas Vehicle Assembly Projects Department's Alibaba page where purchases can be made (http://bigmtauto.en.alibaba.com/)

[37] This is so that they can "get good policies or maybe government order for the assembly project and plant" (Alibaba, 2015).

BIG and firms like it are the hard edge of the Chinese strategy to spur demand for automotive parts by encouraging kit assembly in protected markets. BIG actively seeks partners in protected markets and offers significant up front services for the relatively small cost of collaborating in a joint venture with them. They design and build the plant and supply the equipment and technical assistance required to make it work. Their assembly processes are made up of modular workshops and aimed at producing so as to precisely meet tariff requirements. They even offer to assist firms to produce low value products such as, tyres, tubes, batteries and springs locally if 'CKD' assembly needs to be shown. The most complex assembly process they provide involves: preparation, welding, painting, chassis work, final assembly and then testing.[38] However, in the early stages of SKD it is a far more basic process.

LCVs are all that are produced in the most basic plants BIG offers to establish. With more modules more complex SKD assembly occurs and SUVs can be assembled. Passenger vehicles are only assembled in the most complex assembly process supplied by BIG, which is designed to meet CKD assembly tariff requirements. BIG uses low tech, highly labour intensive practises to achieve this, as such assembly volumes are necessarily very low and cannot be scaled up easily. Profitability is driven by the substantial effective rates of protection enjoyed by assemblers in these markets and low labour costs. What level of complexity is supplied to a partner is at the discretion of BIG and whether they see potential in the market.

BIG supplies all the SKD or 'CKD' kits assembled as well as providing the aftermarket parts. They boast "with this method, you can achieve lots of profits and success, you have greatly reduced the customs duty and shipping freight…" and "seize this chance, you will win, we will win both of us win". Certainly this offer has been readily accepted in Africa, where 60% of their business takes place and they have operations in Egypt, Ghana, Angola and Nigeria. While not all of these are rebadging operations, this is also an explicit service they offer allowing African firms to "create and develop your own auto brand, logo and also expand into neighbouring countries using preferential tariffs".

While the stories attached to brands such as IVM, Kantanka and Matchedje are indeed fascinating they are not as they present themselves. They are not innovators and any innovation in production or design is from their Chinese suppliers. Their continued growth is reliant on high tariffs to protect their inefficiently assembled Chinese vehicles, which are not substantially cheaper than other brands. However, not all prominent indigenous firms are following this route, two firms; Mobius Motors and Kiira are making waves with locally designed vehicles.

Mobius Motors is the brain child of British entrepreneur Joel Jackson. It was founded in 2009 with the goal of creating a cheap vehicle suitable for the rugged roads of rural Kenya (Mulupi, 2015). Jackson has proven to be exceptionally adept at attracting talent and investors. Its investors include American billionaire Ronald Lauder, former Citigroup chairman Richard Parsons and Mahesh Chandaria, a Kenyan billionaire (Herbling, 2014).

[38] See Appendix E for diagram.

The board of advisors is a similarly heavy weight group including a smattering of former Ford and General Motors (GM) executives along with a McKinsey & Company director and the former Safricom CEO Michael Joseph (Mobius, 2015). In 2014 they released their first purchasable vehicle, the Mobius II, which is a spartan eight-seater affair with no power steering, air conditioning, glass windows or interior features (Ramsey, 2014).

Mobius claims that local content is 35% and they hope to raise it to 40% in the near future, which seems very ambitious given that they want to increase production and currently produce next to no components (Ciuri, 2013). Strikingly, the vehicle does not seem to meet its fundamental goal of being affordable as it retails at $11 000, in a country where per capita incomes are around $1 350, although it is the cheapest new vehicle on the market (Mulupi, 2015; World Bank, 2015). So far 50 have been produced to test the market but the Mobius plant has capacity to produce upwards of 500 a year (Blair, 2014).

Another East African venture is based in Uganda. In 2006 students at Makerere University in Uganda were involved in a three year Vehicle Design Summit organised by the Massachusetts Institute for Technology (MIT), focusing on designing an electric car (Mulupi, 2014). Following their involvement in the summit the students designed and built an electric vehicle called the Kiira EV in 2011 (Mulupi, 2014). This incredibly simple vehicle sparked the interest of the Ugandan Ministry of Trade, Industry and Cooperatives which created the Kiira Motors Corporation (KMC), with the aim to develop a more advanced Kiira vehicle and produce it commercially (Mulupi, 2014).

In late 2014 the Kiira EV SMACK was released, a hybrid five seater sedan set to retail at over $30 000 (Mulupi, 2014). KMC needs $350 million to create its production facilities (Mulupi, 2014). If it is able to source this funding it will produce 10 000 vehicles a year. While the majority of the investment has not been secured KMC is in negotiations with the Hinduja group and has an assistance agreement with RLE engineering (Mulupi, 2014; African Review, 2014). Most notably the Ugandan government has invested $70 million through the Ugandan Development Corporation into KMC, as well as barred other assemblers from assembling sedans in Uganda so as to not compete with the SMACK (Odeke, 2014; Mulupi, 2014; Sekalo, 2014). Little of the vehicle seems locally assembled (Nyambura & Njoroge, 2015). In all this seems to be a very poor use of state funds as it is highly unlikely that the remaining $270 million will be found and even if it is, the market for luxury $30 000 electric vehicles in East Africa can only be described as minimal.

Table 18: State of Automotive Industry in SSA

Country	Vehicle parc 2013 (000s)	Passenger vehicle parc 2013 (000s)	Estimated Passenger vehicle and LCV market 2013 (000s)[39]	Passenger vehicle and LCV production 2014 (000s)	Policy	Current Producers	Summary
South Africa	9 526	6 377	619	533	Import tariff of 25%; long standing history of policy currently have the APDP	Toyota, Nissan, GM, Ford, BMW, Mercedes, VW assemble light vehicles. Many truck makers assemble with very low local content	Globally integrated industry exporting to the EU, North America and other markets; Large exports into SSA; now benefitting from market access via membership of SACU, SADC.
Nigeria	3 440	2 700	738.4	1.6	Import tariff of 35% and levy of 35%; NAIDP.	Nissan, Peugeot, Hyundai Renault and Kia all starting to assemble SKD kits from late 2014. Ford, Tata, Toyota and Volkswagen all investigating feasibility. Numerous Chinese brands being assembled.	Some component producers exist, either as a remnant of a historic assembly industry or suppling aftermarket parts; NAIDP has meant in the region of 35 firms, foreign and domestic, are currently investing in the industry; Small operations already exist including a rebadging operation claiming to be an indigenous brand
Kenya	1 060	620	77.6	7.5	Import tariff of 25% on FBU vehciles, 20% tax and 10 year age limit on used vehicle imports.	Mobius Motors produces locally assembled and designed vehicles. Production is 500 vehicles per annum from mid- 2014. Foton established vehicle assembly plant in 2014. KVM, GMEA and AVA assemble around 7 500 LCV and HCV vehicles a year.	Has historic assemblers currently operating at very low volumes but with unused capacity; Burgeoning interest as a possible EAC assembly hub
Zimbabwe	853	750	16.3	0	Import tariff of 60%		Industry has almost entirely collapsed; Chinese firms contemplating establishing 'screwdriver' assembly plants due to high tariffs
Ghana	820	510	105.1	0	Import tariff of 20%; age limit of 10 years on used vehicle imports	SMIDO currently produce negligible numbers but are looking to expand. Kantanka likewise is shifting from artisanal production to small scale assembly.	Small artisanal industry exists; some firms (Mahindra & Mahindra and GAC Motor) investigating creating assembly plants for West Africa; Growing nationalistic fervour about an assembly operation rebadging Chinese vehicles and describing them as local
Angola	803	670	41.9	0	Import tariff of 20%, VAT of 10-30% and a ban on imported vehicles older than 3 years.		No established automotive industry; Speculation that Chinese firms may invest and there is already very small scale assembler of Chinese kits
Senegal	570	270	16	5	Import tariff of 20%	Iran-Khodro (IKCO) plant, under Peugeot license, assembles 5 000 SKD kits a year. Great Wall Motor has an SKD plant.	
Uganda	430	130	27.5	3	Import tariff of 0%, EAC CET of 25% not applied in 2013.	Geely has constructed a SKD assembly plant with a capacity of 3 000 SKD kits assembled a year.	No established automotive industry; State supported firm attempting to create luxury electric and hybrid cars; State dissuading possible investors that may assemble and

[39] The estimations are drawn from the trade flows presented in Section 2.

						Foton are currently setting up production of a similarly sized plant for pick-up trucks and buses. Kiira Motor Corporation (KMC) looking to produce electric and hybrid cars by 2018.	compete for sedan market
Tanzania	360	220	42.6	0	Import tariff of 0%, EAC CET of 25% not applied in 2013.		No established automotive industry; Artisanal production by state research organisation backed by military; Viewed by some Chinese firms as possible EAC assembly hub
Zambia	343	230	28.5	0	Import tariff of 25%		Industry of the 1980s no longer exists; Chinese firm (Higer Bus) contemplating local assembly of buses on very small scale by
Botswana	330	210	34.8	0	Import tariff of 25%, SACU regulations		Had a Hyundai plant assembling CKD kits for South Africa, which broken up and auctioned off in 2001; Still assemble some buses and tractors locally
Cameroon	322	240	33.8	0	Import tariff of 30%		No established automotive industry; Recent investment from Indian and Chinese firms to a small kit assembly operation
Ethiopia	151	90	19.1	6	Imports subject to a 35% tariff on the value of the vehicle including transport and insurance. There is then an excise tax of 30-100% on the total cost of goods and duty. The total cost of good, duty and excise amount is then subject to 15% VAT. That new amount is subject to 10% sur tax. The final amount then pays 3% withholding tax. This can lead to a consumer cost of three times the vehicle, freight and insurance cost. Must be transported on Ethiopian licensed transport to enter Ethiopia.	Yangfan Motors assembles Lifan SKD kits, up to 3000 a year. Betret International Trading Plc runs a plant assembling 1000 SKD BYD cars a year. Mesfin Industrial Engineering Plc assembles 1000 CKD Geely cars a year. Jonny General Auto Car Maintenance and Assembly assemble 200 Fiat and 130 FAW CKD cars a year. BH Trading and Manufacturing assembles Great Wall trucks. Belayab Enterprises assembles Dongfeng light commercial vehicles Solaris Elettra assembles 30 electric cars a week, from Korean, Singaporean and Chinese parts. Global Electric Transportation Ltd hopes to open a 40 000 car a year electric car assembly plant in late 2015.	Very high tariffs have created a plethora of small scale 'screwdriver' assembly operations; Number of 'screwdriver' assemblers still growing; No established components industry
Mozambique	364	270	30.3	5.5		Hyundai to assemble 4 500 cars per year. Matchedje Motors assembles around 1 000 LCVs a year.	No established automotive industry; Recent establishment of two small 'screwdriver' assembly opperations

Sources: Lamprecht (2015); OICA; WITS Database; WardsAuto; Various sources.

Chapter 4: African Aspirations

In recent years there has been increasing interest from countries in SSA to create policy frameworks which foster domestic vehicle assembly. The policies employed by these countries are varied. Some support economy wide industrialisation, expecting an automotive industry to emerge naturally as an element of this approach. Others are targeting the automotive industry specifically with support. In some cases, individual firms have been the target of industry promotion strategies. Any change of the policy status quo amongst countries in SSA also affects the only established industry in the region, South Africa.

Automotive Strategies in SSA

The most notable policy regimes for the automotive industry in SSA, outside of South Africa, are in Nigeria and Ethiopia. Nigeria has a detailed industrial policy for the industry and Ethiopia has extremely high levels of protection. Other countries which have received recent investment in the automotive industry, such as Kenya, Ghana, Cameroon, Senegal, Mozambique and Uganda, do not have comprehensive automotive development plans. Some of them, such as Kenya, have tariff differentials between kit assembly and FBUs, but the difference is not high or part of a coherent automotive strategy (Juma, 2013a). Rather, the combination of growing domestic markets and increased regional integration has attracted investors.

As discussed in the previous section there is by no means a flood of productive automotive investment into these countries. Where automotive investment has occurred in SSA it has been met with a far from uniform response. In Mozambique and Ghana the prospect of local rebadging operations has tapped into a sense of nationalism about the automotive industry. Their governments have pledged to use the rebadged vehicles for their fleets. The state also encourages locals to purchase these vehicles over 'less patriotic' foreign brands, which are portrayed as a drain of foreign exchange (Mensah, 2014; Africa Redemption Magazine, 2014a, 2014b, 2014c; Owusu, 2015; Gasnier, 2015). Uganda has gone further and facilitated investments in one tiny indigenous firm and made it more difficult for international rivals to assemble any competitor in Uganda. This involved delaying permission for plants to be built and then only allowing LCV and HCV assembly at the plants, once permission was finally granted (Emorut, 2013; Odeke, 2014; Sekalo, 2014).

Nigeria

The country most aggressively pursuing an automotive industry in SSA, outside of South Africa, is Nigeria.[40] The automotive policy for Nigeria was developed following the introduction of a general Nigerian Industrial Revolution Plan (NIRP). The NIRP seeks to diversify the economy away from a dependence on oil exports, with the goal of increasing the contribution of manufacturing to GDP from 4% in 2014 to 10% in 2017 (Nigeria, 2014). Part of the general drive to increase manufacturing includes a focus on vehicle assembly, which was once a major contributor to the manufacturing sector. In 2014 Nigeria claimed to have an installed capacity to assemble 108 000 passenger vehicles, 56 000 commercial

[40] This draws on an interview with Alec Erwin, former South African Trade and Industry Minister and advisor to the Nigerian government on its automotive industry.

vehicles, 10 000 tractors and 1 000 000 motorcycles annually. If the capacity still existed in 2014 it was hardly used. Even the Nigerian government suggests that vehicle assembly was at less than 10% of capacity in 2014, in reality it was even less than this (Chamberlain & Ede, 2013; NAC, 2014a). The Nigerian government believes that 200 000 passenger vehicles are imported a year of which 50 000 are new. The government logic is that if imports are restricted then at least 100 000 new vehicles could be assembled for the domestic market, reviving the Nigerian automotive industry (NAC, 2014a).

Erwin (2015) suggests that pressure on Nissan's Africa operation to establish a second assembly plant in Africa encouraged them to actively seek a viable African market. To this end they partnered with the Nigerian conglomerate, Stallion Group. Under their agreement with Nissan, Stallion Group started to invest in a mothballed assembly plant. This investment alerted the Nigerian government to the potential that the automotive industry could be revived. The government quickly charged the National Automotive Council (NAC) of Nigeria, a previously defunct organisation, with creating a policy to stimulate growth in the automotive industry. The result was the National Automotive Industry Development Plan (NAIDP), presented by the NAC as a route to develop a sustainable automotive industry in Nigeria.

The NAIDP puts forward exactly the kind of protection that potential assemblers were looking for. The NAIDP is a detailed 10 year program of industry support through multiple measures, although Erwin cautions that the presented timeline is overly ambitious. The NAIDP broke up vehicle imports into four levels of assembly: FBU vehicles are fully imported; SKD2 is the lowest level of assembly and essentially involves 'screwdriver plants'; SKD1's main difference from SKD2 is that kits are unpainted, so plants need a paint shop and CKD assembly involves all materials being supplied loose, requiring final welding and assembly to happen at the Nigerian plant (NAC, 2014b: 21-22). The NAIDP's primary tool to create a sustainable industry was to revoke a blanket 20% tariff across all vehicle and kit imports and instead set specific tariffs for the various levels of assembly. Erwin argues that creating multiple degrees of assembly, specifically allowing a SKD2 classification, was designed to reduce barriers to investment and attract it as quickly as possible. Once firms have invested and overcome the difficulties of doing business in Nigeria, then differentiated tariffs are intended to encourage them to deepen their investment.

The actual tariff policy of the NAIDP is detailed in Table 18. Unfortunately it seems the difference in levels of protection do not change much over time and are unlikely to encourage any increases in investment. The difference in levels of protection between SKD2 and CKD are just 10% for the entire 10 year period, compared with a 60% differential between SKD2 and FBU imports. This means that as long as SKD2 kits are 10% less expensive than a CKD kit then SKD2 will enjoy a higher effective rate of protection on its value added. When the high fixed costs of creating CKD production in a small market are considered then a 10% greater per unit cost is not at all inconceivable. Additionally SKD2 assemblers are still able to access non-tariff incentives. This then begs the question as to why assembly firms would ever invest beyond superficial SKD2 plants.

Table 19: NAIDP Duty Structure

Period	FBU - PV	FBU - CV	SKD2	SKD1	CKD	Additional Incentives
2014 - 2015	70%*	35%	10%	5%	0%	Import of FBU – PVs at 35% or CVs at 20% equal to **double** the number of CKD or SKD kits imported
2016 - 2018	70%*	35%	10%	5%	0%	Import of FBU – PVs at 35% or CVs at 20% **equal** to the number of CKD or SKD kits imported
2019 - 2024	55%+	35%	10%	5%	0%	Import of FBU – PVs at 35% or CVs at 20% equal to **half** the number of CKD or SKD kits imported

Source: NAC 2014

*Constituted of 35% duty on all FBUs and an additional 35% levy on passenger vehicles irrespective of whether they are new or used

+ Constituted of 35% duty on all FBUs and an additional 20% levy on passenger vehicles

There has been resistance to the policy from consumers and vehicle importers. This resistance led to three delays in implementing the tariff hikes. They were first meant to be implemented in July 2014, then January of the next year, then April and finally were implemented on the 1st of July 2015 (Nnabugwu, 2015; Bisiriyu & Oseghale, 2015). The official reason for the delays was the lack of installed capacity in the automotive industry (Nnabugwu, 2015). This is suspicious given that in 2014 the Nigerian government claimed to have installed capacity to assemble 108 000 passenger vehicles and a maximum new vehicle market of 100 000 after tariff introduction (NAC, 2014a). Unofficially, many speculated that the closeness of the election in early 2015 was the real motivator for delays, with neither side wanting to go against popular opinion until their position was secure (Nnabugwu, 2015).

The tariff hike and the NAIDP's allowance for assemblers to import FBU vehicles at reduced tariff rates encouraged a large number of firms to promptly declare their intention to assemble in Nigeria. This is exactly what Erwin was hoping for by allowing low barriers to assembly. The NAC claimed that in 2014 as many as 23 firms signed up to the programme, resulting in the contribution to GDP by the automotive assembly sector increasing by 26% (Furlonger, 2014; Nnabugwu, 2015). By the middle of 2015 the levels of interest had grown to 35 firms in various stages of investment and production (NADDC, 2015). The NADDC, formerly the NAC[41], documents the 35 firms are listed as already having installed capacity to assemble 320 920 vehicles a year, across all categories (NADDC, 2015). Incredibly they claim installed CKD assembly capacity of 140 630 units a year of which the vast majority are trucks and buses (NADDC, 2015). Despite these huge 'capacity' claims even the NADDC expects only 23 071 vehicles to actually be assembled in 2015, 47% are from 'CKD' plants namely: IVM, Peugeot and Leyland. This application of the NAIDP's CKD definition seems to be very generous. IVM has been discussed previously and it is unlikely that it is close to true CKD. Leyland and Peugeot are historic producers in Nigeria and their previously mothballed plants may well have been CKD assemblers in the 1970s and are now using those same processes.

The unfortunate reality is that to avoid the newly imposed tariffs, vehicle distributors are importing FBU vehicles without their wheels or bonnets attached and claiming that they are SKD2 kits (Echenim, 2015). This allows them to pay a tariff of 10%, lower even than the pre-

[41] As the NAIDP has grown the NAC merged with the Centre for Automotive Design and Development (CADD) and was re-designated the NADDC.

hike 20%. These firms also then face a much reduced tariff rate on their imports of twice the number of FBU vehicles than the number of 'SKD2' kits they import (NAC, 2014b; Echenim, 2015). Despite firms dodging the tariff, vehicle prices increased by between 20% and 50% after its implementation, suggesting some firms are making exceptional profits (Bisiriyu & Oseghale, 2015). The price increase is mostly driven by a reduced supply of low cost second hand vehicles. There has been an up to 70% reduction in the number vehicles arriving in Nigerian ports (Bisiriyu & Oseghale, 2015). This environment is extremely attractive to firms like BIG who are able to use the massive effective rates of protection to sell their cheap, marginally locally assembled, vehicles at high prices.

Along with the tariff incentives for assembly there are other NAIDP policies to encourage an automotive industry. These include: industrial infrastructure development, skills development, standards, investment promotion and a vehicle purchase scheme (NAC, 2014c). The NAIDP proposes that automotive supplier parks and clusters can be developed with the infrastructure required by the automotive industry (NAC, 2014c). Islands of effective infrastructure provision would allow the serious infrastructure limitations of Nigeria to be redressed, giving automotive firms access to the logistics, energy and other infrastructure they need. The Nigerian government does not plan to cover the cost of cluster infrastructure themselves. Rather they hope to encourage firms to build the infrastructure they need by making 20% of any infrastructure investment tax deductible (Aderemi, 2014).

How many clusters will emerge is unknown but three existing clusters have been identified with the hope they will form the core of the industry. They are: Lagos-Ogun-Oyo, Kaduna-Kano and Enugu-Anambra (NAC, 2014c). These 'clusters' cover very large areas, for example, it is over 230 kilometres from Lagos to Oyo and Kaduna to Kano. Enugu is slightly closer to Anambra at 80 kilometres. The Lagos-Ogun-Oyo region cluster has received by far the most interest. Of the 35 assembly plants the NADDC has registered, 28 are in Lagos-Ogun-Oyo (NADDC, 2015). This is also the cluster where all the major OEM linked local firms are located. Nissan, Kia, Hyundai, Honda, Toyota, Ford, MG, Mitsubishi and Isuzu are all being assembled in this cluster. Kaduna is the historical location of Peugeot's Nigeria operations and has little else in it (NADDC, 2015). Mercedes's HCV operation and IVM's assembly plant are located in Enugu-Anambra (NADDC, 2015). As yet no procedures to supply special infrastructure to these 'clusters' or to foster linkages have been implemented. Instead the clustering in Lagos-Ogun-Oyo, where the best infrastructure currently exists, suggests that firms do not intend to invest heavily and create infrastructure for the Nigerian government, unless it is absolutely necessary.

The skills development and standards sections of the NAIDP call for appropriate bodies to be established to ensure there are skilled workers and high standards in the industry (NAC, 2014c). Whether these measures will be implemented in any meaningful fashion is not certain. The NAIDP aims to promote investment through a number of means. The core investment promotion polices include the all-important tariffs and a requirement that all vehicles purchased by the government are locally assembled (NAC, 2014c). The second measure is to reduce smuggling. It is planned to achieve this using an upgraded National Vehicles Identification System (NVISA) and more thorough customs procedures. These include that vehicles will supposedly be escorted from neighbouring country's ports to the

Nigerian border, to ensure they are not smuggled through (NAC, 2014c). The final two avenues to contribute to securing investment are: the long term nature of the NAIDP and the active marketing of Nigeria to OEMs (NAC, 2014c).

The last tenet of the NAIDP is a vehicle purchase scheme. It is viewed by commentators as a cushion against public anger at rising vehicle prices. It would involve reduced interest rate vehicle financing for members of the public purchasing vehicles, it will be in part funded by the higher tariffs on FBU vehicles (NAC, 2014c). The NADDC and the South African vehicle loan provider WesBank have come to an agreement to this end (Echenim, 2015). The scheme will allow loans for locally assembled vehicles to be accessed at 10% to 12% interest rates, against the currently available loans which have interest rates in excess of 20% (Nnabugwu, 2015). However, many of the policies outlined have so far not been implemented and those that have continue to face significant obstacles. There are already accusations that firms who are dodging the tariff increase with false SKD2 assembly are trying to also take advantage of the loan scheme (Echenim, 2015). Additionally, the number of FBU vehicles shipped to neighbouring Benin has increased by more than 50% in the first month of 2015, as more vehicles are smuggled across the border (Games, 2015).

For Nigeria's automotive industry to be sustainable there has to be local component production, or else SKD assembly is just a redistribution exercise from consumers to assemblers. To move from SKD2 to SKD1 and then CKD requires both increased plant investments from assemblers as well as component manufacturers. There are right now very few component suppliers, outside of the Nnewi cluster. Some did exist in the 1980s but have largely closed down, for example in Lagos-Ogun-Oyo area there were once: battery producers, brake pad producers, tyre manufactures, glass suppliers and body parts producers (Oladele, 2014). To encourage component manufacturers to invest the NAC was given legislative power to increase tariffs on specified components by up to 35% (NAC, 2014c). There has yet to be a specified policy on how a local content scheme would work and what components will or won't qualify for protection. However, the intention is clear that there will be some local content scheme to encourage investment in Nigeria from component producers. SKD2 assemblers will most probably resist these measures and their large numbers will make them a considerable political obstacle to the industry progressing beyond their form of 'screwdriver' assembly.

Ethiopia

Ethiopia is the most protected automotive market in SSA and with a population of nearly 95 million people it is a potentially attractive investment location for OEMs. Ethiopia's protectionist structure has many levels which make all vehicles expensive, but especially so if they are FBU imports. The first barrier is that a FBU that is to be imported must arrive in Djibouti on a ship operated by the state owned Ethiopia Shipping Lines. The second is that the main route into Ethiopia is from Djibouti[42] and transport costs are notoriously high, reaching up to $4 000 per container traveling from Djibouti to Addis (Jobson & Van Valen, 2014). Following these costs a FBU vehicle will be subject to a 35% tariff on its total cost, which includes transport and insurance (Abiye, 2014; 2Merkato, 2009). An excise tax must

[42] Ethiopia is a landlocked country which lost its access to its historical ports when Eritrea seceded.

then be paid of between 30% and 100% of the total cost plus the tariff amount, the percentage value of the excise tax is determined by engine size (Abiye, 2014; 2Merkato, 2009). VAT of 15% is then paid on the new total amount, followed by 10% surtax and 46% sundry taxes (Abiye, 2014; 2Merkato, 2009).

These barriers mean that a 1989 or 1990 Toyota Corolla will sell for $14 000 to $15 500, compared to between $1 600 and $2 500 for the same car in South Africa (Abiye, 2014). Vehicle assemblers face a slightly reduced level of taxation. They are exempt from the surtax of 10% as well as the sundry taxes of 46% and instead of a 35% tariff pay only 5%, which is pushed to 10% if they are regular importers (Abiye, 2014). These tax breaks have led to an influx of 13 assemblers operating in Ethiopia. The reduced taxes result in a newly assembled Lifan 520i costing $13 900, but this is still far above the $8 300 for the same model sold in South Africa (Oosthuizen, 2011; Abiye, 2014). The combination of high vehicle costs and low income levels, GDP per capita is $568, means that demand is limited (World Bank, 2015). The entire Ethiopian passenger vehicle and LCV market is only 19 100 vehicles per annum and assembly capacity is below 6 000 vehicles a year.

The protectionist policies in Ethiopia are about state revenue first and promoting assembly second. The Metal Industry Development Institute, the government body responsible for the automotive industry, along with the Automotives and Machineries Importers & Assembly Sectoral Association, the industry association, both want to change this and ramp up Ethiopian assembly (Dyson, 2012; Gebrehiwot, 2014). To this end the Ethiopian Revenue and Customs Authority recognised that it may need to increase the differential in tariffs and taxes to encourage local manufacturing (Abiye, 2014). However, with such low levels of domestic demand, Ethiopia is many years away from achieving economies of scale, unless it is able to substantially lower vehicle prices. Any industry would then need to be more competitive, surviving with reduced protection or exporting if it is to be sustainable.

South African Response

The African market is of great importance to South Africa and has been the destination for up to 29% of South African passenger vehicle and LCV exports (Lamprecht, 2015: 49). This relationship is a one way trade with South Africa importing less than R150 million in 2014 from the rest the continent, compared to the R31 621 million exported (Lamprecht, 2015:38-83). This relationship could well change if other African countries start to assemble vehicles instead of importing FBUs from South Africa. Therefore, the automotive policies of other African nations are of great concern to South Africa's government, producers and the over 100 000 workers in the sector (OICA, 2015).

South Africa's exports to the rest of Africa have already been negatively affected where more restrictive import regimes have been implemented. The biggest negative impact so far came from outside SSA, Algeria is the largest African market for South Africa and light vehicle exports decreased by 49% between 2013 and 2014 (Lamprecht, 2015: 38-39). This is due to Algeria stopping government support for firms buying LCVs (Furlonger, 2015). Exports of light vehicles to Nigeria also fell 11% in the 2013 to 2014 period (Lamprecht, 2015: 38-39). Worryingly for South Africa, the decrease in exports to Nigeria occurred before the higher tariff rate was implemented, in July 2015. While uncertainty about policy may have created a

dip in exports, it is likely that the real impact on South African exports of the Nigerian tariff hike is yet to be felt.

Two distinct camps have emerged as to what the longer term impact of Nigerian automotive policy will be for South African industry. The one view that Erwin espouses is that Nigeria was always going to get into automotives eventually and South Africa can either fight this, fruitlessly, or try to benefit from it in some way. Erwin's suggested way to benefit is to create a special relationship between Nigeria and South Africa. This could result in Nigeria giving preference for components and kits exported from South Africa in exchange for assistance in establishing a high quality assembly industry. As the Nigerian industry grows, so the countries can specialise, with Erwin suggesting that Nigeria would focus on plastics and rubber components and South Africa electronics and metals. Likewise, Erwin is confident that Nigeria will produce some models and South Africa others (Smyth, 2015). This view is echoed by Nissan South Africa's managing director Mike Whitfield, who has driven Nissan's entry into Nigeria (Cokayne, 2014a). Despite initial resistance, Erwin and likeminded associates have convinced NAAMSA and the DTI of this view and so it has become the official South African stance on the Nigerian automotive policy (Cokayne, 2014b, 2014c).

There are other industry players who are concerned that if the Nigerian automotive industry takes off, it will start to take business away from South Africa (Smyth, 2015). If Nigeria assembles the same models as South Africa, but sources their kits and components from elsewhere, this will deprive South Africa of potentially its largest export market in Africa. Nigeria could go further and export its assembled vehicles to ECOWAS countries if the group creates a common external tariff, denying South Africa an even larger market (Smyth, 2015). It is quite probable that kits and components won't be sourced from South Africa. This is because it is not among the most competitive automotive manufacturing industries in the world. Geographically South Africa is not even as close to Nigeria as Western Europe, or major developing world producers such as Turkey.

If different models are being assembled in Nigeria than are produced by South Africa then there is no hope of South Africa supplying the kits. The Nigeria automotive policy could also have the possible effect of drawing FDI away from South Africa. As the SSA market grows producers may invest in true manufacturing in South Africa, as is required by the APDP, with exports to the region justifying the required scale of production, which would be unsupportable by the South African domestic market. However, if the large regional markets are protected firms could instead opt to build low cost SKD assembly in Nigeria and elsewhere, producing only for domestic demand and eschew South Africa where entry requirements are higher.

So far it seems both groups have been partially correct. Exports have indeed dipped, reversing what had been a trend of growth. Likewise, the models to be assembled in Nigeria are quite often the same as those produced in South Africa, such as the Nissan NP300 LCV and the Ford Ranger LCV (Smyth, 2015; Ohuocha, 2015). However, in both cases the kits are being sourced from South Africa (Smyth, 2015; Ohuocha, 2015). There has also been the case of Peugeot deciding not to establish production of its 301 model in South Africa, citing a lack of demand for the investment required, while simultaneously building a SKD plant for the model in Nigeria supplied with kits from elsewhere (Cokayne, 2014d).

If South Africa is not a globally competitive production location then it is unlikely that the country will secure benefits from a Nigerian assembly industry, as kits and components will be sourced from elsewhere. Likewise, if Nigeria successfully advances to full domestic production it will likely have to have become a SSA production hub with extensive exports and in all likelihood will be producing a similar range of models for this market as South Africa. This could create intense competition with South African for investment in production by assemblers and component producers. However, if South Africa establishes a special relationship with Nigeria advantaging South African produced kits, South Africa could possibly outcompete more competitive kit production locations. A Nigerian kit assembly industry would then increase demand for South African production and the countries would not compete as directly for investment. This suggests that the most beneficial outcome for South African industry is to secure a special relationship with Nigeria and that it become trapped in low local value added SKD assembly. South Africa may well then be best off with a Nigerian worst case scenario, where value added outside of labour occurs in South Africa and Nigerian vehicle prices are high. An example of this relationship is Hyundai's Nigeria operation. The firm assembles all vehicles for the Nigerian market fully in South Korea and then disassembles them to be 'assembled' once more in Nigeria. Without a special relationship with Nigeria it seems unlikely that firms would locate this kind of full production for kits in South Africa. Lower cost global production locations which already produce the desired models are a far more likely choice.

Chapter 5: Is SSA a viable automotive space?

Whether SSA is a viable automotive space is then a fundamental question needing answering. A number of countries and firms seem to have bet that it is, while many others are waiting before acting. If it is then there is the possibility that this final frontier of automotive production will be a frontier no more. However, if all these automotive aspirations are in fact misplaced then the newly encouraged industry could well be an enormous waste of resources and will flounder.

Sufficient Market

An 'automotive space' is where there is a large enough market to justify large scale assembly. There are a number of ways for this to occur, it could be a large emerging market area (LEMA), on the periphery of such an area (PLEMA) or else where the domestic market is effectively expanded through trade agreements to create a larger regional market (Humphrey & Oeter, 2000). The two largest markets in SSA are Nigeria and South Africa and neither of these markets is large enough to sustain the scale of production required for a self-sustaining industry (Black & McLennan, 2015). Where plants need to produce at a scale of over 150 000 units a year[43] and components far beyond that, it is only through exports that South Africa is able to have a sustainable automotive industry (Abrenica, 1998). However, looking beyond South Africa and Nigeria the average market size for new and used, passenger vehicles and LCVs in the next 8 largest markets is 50 979 vehicles a year. This is comprised of such a plethora of vehicle models, makes and production years that without very high protection, assembly is not viable (Abrenica, 1998; Lester, 2015).

While SSA is comprised of very small markets the combined market of the regions is actually quite large, at 1.84 million passenger vehicles a year and a not unsubstantial GDP of over $1.8 trillion (Black & McLennan, 2015). SSA as a whole has a population and passenger vehicle market equal to over 70% of India's. However, SSA's automotive production is equal to only a tiny 8.4% of India's (OICA, 2015).[44] India's production is such that not only does it have truly indigenous brands such as Tata and Mahindra, which dominate the domestic market, but it is also a large automotive exporter. India had a total automotive trade surplus of $8.27 billion in 2013 from the exports of in passenger vehicles, commercial vehicles, buses, motorcycles and parts (DESA/UNSD, 2015). In contrast SSA is almost entirely import dependant, outside of South Africa, with each small individual market importing from global producers. This has meant that SSA had a trade deficit of $18.34 billion in 2013 for the same products that India has a trade surplus (DESA/UNSD, 2015). The simplicity of the comparison aside, the core reason for the difference is that India has a single market, with a high external tariff and restrictions on used vehicle imports. SSA's fragmented markets have simply not allowed for a similar scale of vehicle production.

Regionalisation Prospects

Regional integration is a stated goal of almost all political entities in SSA. To this end there are an array of trade agreements and organisations that overlap. The five main ones are: the

[43] See literature review

[44] See Table 1 in the introduction.

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). The agreements have created some degree of free trade between members with some going further than others.[45] Additionally in June 2015 the Tripartite Free Trade Area (TFTA) which is to link SADC, COMESA and EAC was officially launched (Deshmukh, 2015). This would be a powerful step to creating a large SSA free trade area. The most fundamental barrier to creating an integrated market for automotives in SSA is the costs of trade diversion (Black & McLennan, 2015: 22). These costs are particularly steep when national markets are mostly comprised of low cost, relatively high quality, used vehicle imports (Black & McLennan, 2015: 22). At its core, the question is why would a country like Tanzania want to buy expensive Kenyan made vehicles rather than allowing imports of cheap, high quality Japanese used cars (Black & McLennan, 2015: 22)?

This is exactly what regional organisations have been grappling with. Kenya, hoping to build on its current assembly industry and become the regional hub, managed to negotiate a common external tariff (CET) of 25% in the EAC for vehicles. This is a relatively large increase for some of the other members, given that Tanzania and Uganda have 0% tariffs on vehicle imports. Kenya also negotiated to get VAT in EAC countries calculated on the price of locally assembled vehicles at the factory exit and not after transport to the point of sale (Ligami, 2014). However, the CET has so far come to nothing as the member nations were granted a stay on its implementation, meaning Kenyan assemblers continue to face 25% duties for Rwanda and Burundi and unconstrained competition in Tanzania and Uganda (Olingo, 2014). Kenyan assemblers also face bureaucratic hurdles, with the EAC requiring kits to be imported under the individual tariff lines of the components in the kits and a vague duty remission scheme (Olingo, 2014).

ECOWAS established a CET in 2015 which sets passenger vehicle tariffs at up to 20% depending on the size of engine. Countries are then allowed to add an Import Adjustment Tax (IAT), which Nigeria promptly used to create its 70% duty on the imported vehicles. The IAT applies to all other ECOWAS nations and so ensures that auto assemblers would not establish a plant elsewhere in ECOWAS to access the Nigerian market. Other ECOWAS nations are also able to use IATs so as to restrict Nigerian assembler's access to their markets. The uneven levels of protection have also meant that smuggling is expected to intensify between ECOWAS nations (Adeniyi, 2015).

If SSA is to become a viable automotive space then it is vital that the necessary market exists. To this end regional integration can create a large and rapidly growing SSA market. The automotive industry could actually act as a driver for integration, if producers are able to put pressure on governments to increase regional market access and infrastructure integration (Lung & van Tulder, 2004). This will not occur if the countries with large domestic markets do the opposite and raise protection, so as to encourage the development of national automotive industries. It is then of vital importance that the attempts to create an automotive industry are agreed on as part of regional industrial policy. Otherwise, each nation may just

[45] See Appendix G for the membership of various agreements.

be able to boast of domestic 'screwdriver' plants and high vehicle costs, as is currently the case in Ethiopia.

Manufacturing Capabilities

For there to be vehicle production in SSA there also needs to be competitive manufacturing capabilities. Unfortunately, African manufacturing firms operate in environments that have worse infrastructure, geography, access to credit as well higher tariffs, levels of political monopoly and corruption than similar income countries (Harrison, Lin & Xu, 2014). As such much of Africa suffers from high manufacturing costs. Cost can be direct such as capital, labour and electricity. Alternatively they are of an indirect or invisible nature, both of which arise from outside the actual manufacturing process (Iarossi, 2009). In Africa it is the indirect and invisible costs that are the major contributors to high manufacturing costs (Iarossi, 2009). African firms are found to have poorer performance than comparator nations in almost all performance outcomes: labour productivity, labour productivity growth, total factor productivity, sales growth, export share and investment intensity (Harrison, Lin & Xu, 2014).

The operating environments lead to a number of specific costs that cause this poorer performance. Manufacturing wages in SSA are significantly higher than in Asian countries with comparable per capita incomes (Table 19). SSA firms face high interest rates on loans, with a less developed banking sector than in Asia. Electricity provision and cost varies widely across the region but in many cases is a substantial burden on manufacturing firms. High transport costs and difficult regulatory environments both make manufacturing more expensive than elsewhere (Ianossi, 2009). The largest costs for a manufacturing firm in SSA are the invisible ones. These are, amongst others: that high collateral is needed for loans and the costs from infrastructure failures and corruption. Examples of infrastructure failure incurred costs are the losses firms face when electricity supplies are intermittent or the cost of investing in private generation capabilities. South Africa, Kenya, Nigeria and Ghana all have particularly severe electricity shortages and are some of the most industrialised economies in SSA (The Economist, 2014; Obulutsa, 2015; BBC, 2015b).

Table 20: Wages in manufacturing, compared to GDP

	Annual wages $ (2007)	GDP per capita 2007 (real)*	GDP per capita 2007 (current US$)
South Africa	13 380	5 894	6 154
Turkey	10 209	7 776	9 312
Brazil	9 216	5121	7 194
Morocco	7 263	2 116	2 416
Malaysia	6 277	6 008	7 218
Russia	6 042	6 311	9 146
Tunisia	5 659	3 543	3 806
Mauritius	5 022	5 580	6 286
Kenya	2 905	565	848
China	2 899	2 203	2 651
India	2 352	864	1 069
Malawi	1 885	225	266
Tanzania	1 709	405	538
Indonesia	1 667	1 389	1 871
Lesotho	1 586	764	817
Sri Lanka	1 529	1 400	1 614

Vietnam	1 339	784	919
Ethiopia	1 090	190	245

Source: UNIDO Statistics; World Development Indicators, World Bank; *at constant 2005 US$; Complied in Black & McLennan, 2015

Ianossi (2009) found that invisible costs accounted for 13% of sales in Africa. This can be compared to less than 8% in South Asia and below 3% in East Asia (Ianossi, 2009). However, Harrison, Lin and Xu (2014), find that when infrastructure, access to finance and the political and business environment are all controlled for, African firms show a large conditional advantage in productivity, productivity growth and sales growth compared to similar income countries. This means that given a challenging environment African firms perform better than those in countries of a similar income, perhaps giving some hope to African manufacturing (Harrison, Lin & Xu, 2014: 59-74).

There is no data on the cost of manufacturing in the automotive industry in SSA outside of South Africa. As such when looking at the automotive industry specifically it is necessary to use South Africa, even though it is very different from other SSA countries. Barnes et al. (2015) did a comparative study on the cost of production in South Africa and Thailand. Thailand is a low cost globally competitive automotive industry and the largest producer in the ASEAN bloc. On almost all indicators, Thailand had a substantial cost advantage over South Africa. It is noticeable that in the comparisons certain categories of labour have particularly high wage differentials. Although this could be partially attributable to different skill levels attached to the same job title in the different nations. Not only were wages considerably lower but firms in Thailand also had better scores on the productivity measures of quality, flexibility and inventory levels. The cost of logistics and utilities were also lower for firms in Thailand and South Africa has the most developed logistics and utilities infrastructure in SSA.

Table 21: Labour and employment costs: South Africa and Thailand

Employment category	Avg. number of employees	Median cost per employee in South Africa	Median cost per employee in Thailand	Ratio; SA to Thailand median costs per employee
Management	18	R 428 500	R 158 148	2.7:1
Professional	17	R 275 500	R 47 520	5.8:1
Supervisors	44	R 122 000	R 29 946	4.1:1
Artisan	40	R 267 000	R 22 080	12.1:1
Production	613	R 53 334	R 19 320	2.8:1
Apprentices	37	R 38 448	R 16 560	2.3:1
Total	769			

Source: Barnes et al. (2015)

Suggested Policy

Given all the facts laid out in the proceeding sections, that SSA does not have an automotive industry even a third the size of India's could be seen as an indicator that the region lacks comparative advantage in the sector. In the vein of Lin's arguments, (Lin and Chang, 2009), if there were opportunities to be had for large scale production then firms would surely have

taken advantage of them. However, automotive industries have never emerged without policy intervention and SSA would be no different. What policies countries in SSA and the region as a whole choose to introduce, so as to encourage an automotive industry, will be the core reason for its success or failure.

Protection Requirement

With huge inflows of used vehicles, some of which are of good quality and low price, from Western Europe and Japan into SSA, no industry will be able to take off without protection. This is not unique to SSA. Automotive industries have never developed without tariff protection, as it is impossible for them to compete with used vehicles from the outset. Used vehicle imports prices are artificially low, due to market distorting policies encouraging local consumption or environmental protection as outlined earlier in this paper. Unprotected firms will never make the necessary investments to create a sustainable, competitive industry. In countries such as South Africa, Thailand and Brazil the industry still receives protection long after establishment (UNCTAD, 2015). Erwin and Lester both decry used car imports, not only as they price out local assembly, but also since they create an enormous array of makes and models in the market. This makes it very difficult for any local component manufacturers to produce at scale for the aftermarket, as there is no consolidated parts market beyond the most basic common components.

It is then vital for any country looking to establish an automotive industry in SSA to control the imports of used vehicles. Even with legislation in place actually controlling these imports is difficult, for example when Nigeria limited imports to vehicles not older than seven years banned vehicles were simply smuggled in (Beuving, 2004). Through increased policing it may be possible that even if smugglers can bribe their way past customs the increased costs of transporting the vehicles surreptitiously and bribes actually become an import barrier for vehicles.

Encouraging a Commitment to CKD

As discussed in previous sections the automotive industry is highly scale intensive, for both assembly and component manufacture. When a small market establishes protection it is unlikely to reach the required levels of scale to operate efficiently. The incentives created for firms by high levels of protection are to assemble many models, maximising consumer choice, while minimising their capital expenditure. This is exactly the opposite of what a components sector requires to grow, which is production consolidated into a few models with large scale production runs. As argued by Black (2007) low volume production creates greater external diseconomies to the production process than internal to it and so assemblers pursue the strategy that is most adverse to components firms.

This is exactly what has been occurring in Nigeria and Ethiopia with their protectionist policies. Large numbers of plants assembling a wide array of makes and models are emerging. Unfortunately this has meant that the plants are focused on SKD assembly and do not have the capacities to assemble using anything but the most basic locally produced components. The local component manufacturing sector is then locked into producing products that are common in all vehicles and require minimal technological capabilities to

include in the assembly process. These components are limited to the likes of tyres, batteries, springs, radiators, brake pads, cables, rubber and plastic components.

A possible reason to pursue this industry development route is that investment in SKD assembly is viewed as part of the gradual plan to introduce the industry. The tariffs force investment which is then expected to be slowly ratcheted up and more value added locally. SKD is allowed as firms are initially unwilling to commit to any major investments since they do not know if protection will remain, the countries technological capabilities in the automotive industry or how the domestic market will respond to import restrictions. Certainly, in a nation like Nigeria firms will be waiting to see if smuggling can be controlled and the government can resist pressure from the public and port operators to reduce tariffs.

The difficulty with this strategy is how to drive the incremental investment and production increases it requires. The initial investments in SKD plants do not lay a foundation for CKD assembly and then full manufacturing, but are completely different production process. There is then no natural driver that encourages firms to move beyond their SKD assembly, any transition is reliant on industrial policy measures. A larger market with these polices simply encourages investment in plants with larger SKD assembly capacities but not CKD assembly. In Nigeria, optimistic market estimates have meant that there are already initial investments in relatively large capacity SKD plants, such as Stallion Group's 45 000 unit a year plant (Abioye, 2013).

If the government seeks to enforce a transition to CKD assembly, so as to create assembly processes which local component firms can supply, the multitude of firms involved in SKD assembly will resist its efforts. Pressure will come from both from foreign and local investors who do not wish to lose the investments they have made and re-invest in a fundamentally new process, their plants often needing to be redesigned and refurbished. Foreign investors tend to partner with politically connected business groups, which have the capital and capabilities to engage in vehicle distribution and/or assembly. Local partners who meet these requirements are usually some of the most powerful business groups in the country, as has been the case in Nigeria and Ethiopia. Foreign investors, local firms and labour involved in SKD assembly may together have enough political clout to stall any rationalisation process and hold countries in SSA indefinitely in SKD assembly.

Rather than pursuing the current extreme effective rates of protection, countries should rather attempt to pursue a medium tariff level. Industry insiders suggest that a tariff level of 35% is enough for a market to be investment worthy, as long as the import of used vehicles is also controlled. This should be partnered with low level tariffs on imported components, so as to provide reasonable effective rates of protection. The aim would be to attract a relatively small number of reasonably large investments in CKD assembly from the start, with SKD assembly as heavily penalised as FBU imports. The few CKD operations could then be more easily concentrated in special economic zones (SEZs) and benefit from clustering and a more conducive business environment. Investors would seek to localise component production from the outset and could encourage members of their global production networks to follow them into the market. As efficiencies improve with time and a growing market so more components would be localised and the industry could become sustainable.

Special Economic Zone

As the manufacturing costs in SSA are mainly a result of factors outside the control of firms, it is up to countries to improve this. If they are able to, then costs could drop radically. As Harrison, Lin and Xu (2014) confirm, firms in Africa are actually highly productive, it is the environments they operate in that make them less competitive than comparator country firms. Massive projects to provide power and transport infrastructure as well as drives for legislative streamlining are all occurring in SSA. Although this is not an issue which can be solved overnight, it is certainly something that is recognised as needing to be addressed (Aryeetey & Moyo, 2012).

In the short term, these issues can possibly be tackled with special economic zones, with specially provided infrastructure and legislative rules. SEZs are useful as an entire country does not need to become globally competitive in a sector or attract FDI, rather a targeted area within that country can be developed (Watson, 2001: 15). SEZs can be granted favoured treatment with respect to taxation, infrastructure, import controls and industrial regulations (Jayanthakumaran, 2003: 52). Additionally bureaucratic procedures for SEZs are streamlined. For example in Turkey it takes on average half the time to get a telephone connection, electricity connection, water connection or construction permit in a SEZ than in a non-SEZ area (World Bank, 2010:21-22).

This makes development objectives become more achievable by focusing on a single geographic region. For example, a country as a whole may have no logistics industry to speak of and be unable to change this at any great pace, but within the SEZ, the country can focus resources and construct world class logistics infrastructure. Countries can use SEZs to focus on any elements of the prevailing business environment that would constrain component and assembly firms, such as electricity provision and customs controls (Watson, 2001: 15). This has been a highly successful approach in Asia where these 'incubators of policy' were supplied world class infrastructure and reduced red tape which enabled them to become engines of growth (World Bank, 2008).

Regional Integration[46]

In SSA, outside South Africa, the individual markets are unlikely to be large enough to attract CKD investment without severely limiting consumer choice. Possibly Nigeria could be an exception, so long as the country continues to experience rapid economic growth and their automotive policy is dynamic and responsive to the investment they have attracted so far. However, for all other countries their markets are simply too small, as noted in earlier sections. While current steps towards integration has not progressed as quickly as was hoped, significant potential exists.

Barnes argues strongly for a SSA regional policy for automotive production. This is something that needs to be driven, but not totally dominated, by the only existing producer South Africa. Barnes does not see any other SSA country able to create anything close to a fully functional automotive industry without a regional policy. As demand is unleashed in the

[46] This section draws on an interview with Professor Justin Barnes, Chairman of B&M Analysts.

region, countries need to be discouraged from each pursuing individualistic industrial policies for the automotive industry. This will necessarily require countries, especially South Africa, to not attempt to seize all the gains from increased new vehicle demand. Through co-ordination regional production and localisation can be maximised but for countries to submit to this they will need to feel their individual gains are not diminished.

A crucial element of this is that South Africa cannot think that it can either survive without the region or bully the region into a one sided agreement. Barnes stresses that localisation of production cannot increase in South Africa without an associated increase in production and South Africa's domestic market is quite simply not big enough to provide it. Problematically Asian labour is more productive than South African labour and so South Africa's share of global production has been shrinking. This leaves South Africa in a perilous situation and only just able to remain as a tier three producer, a single level above kit assembly.

Fortunately there is a real opportunity for growth and that is in the SSA market. A protected regional market which manages to boost South African production to 1.2 million vehicles a year would add at least 100 000 jobs. With a considered regional automotive industrial plan, much like ASEAN, these jobs and future ones could be shared amongst the countries in the region. A key difference between ASEAN and SSA is that South Africa is a regional hegemon with a well-developed industry and technological capabilities while the region lags behind, in ASEAN the countries are more similar.

The Motorcycle Alternative

The relatively small current market for passenger vehicles raises doubts about attempting to jump to fostering vehicle assembly in SSA. A possible alternative strategy is to first focus on motorcycle production before moving to automotives. This is a strategy that has been used in a number of Asian countries, where motorcycle industries also stimulated general industrialisation (Ohara & Sato, 2008: 11&12). The core technology for the commercial 'workhorse' motorcycles which dominate the market in developing nations has not advanced since Honda released the 'Super Cub' in 1958 (Ohara & Sato, 2008: 4). This means the production technology is mature and accessible to a developing world producer (Ohara & Sato, 2008: 4). Additionally production of these bikes is simpler than cars and they are composed of only 10% of the parts needed for a passenger vehicle (Ohara & Sato, 2008: 3&4). Motorcycles with their comparatively lower levels of technological complexity and large domestic markets are then more attractive for less industrialised nations to produce than passenger vehicles (Ohara & Sato, 2008: 3). Unlike in light vehicles, individual SSA countries have large motorcycle markets, which would allow high levels of localisation and real manufacturing if incentivised.

Chapter 6: Conclusion

SSA is experiencing huge growth in demand for light vehicles. This is unlikely to abate as projections suggest a rapidly expanding middle class. However, growth in vehicle demand is almost entirely concentrated in used vehicles from the developed world. Conversely growth in new vehicle imports from Triad exporters is almost stagnant and even generous estimates of total new vehicle demand are still very small. With unconstrained imports of cheap used vehicles, an automotive industry will never be able to emerge in SSA, outside of the existing protected industry in South Africa.

Growing used vehicle imports represent an increasing burden on countries in SSA's current accounts, as they deepen countries' automotive trade deficits. A number of countries in SSA have indicated that they wish to change this by instead locally assembling vehicles. These countries also view establishing an automotive industry as a means to increase industrialisation and employment levels. Quite correctly these countries realise that there can be no domestic industry in a country which allows the free import of FBU used vehicles. As such a tariff policy targeting used vehicles or an outright ban are necessary steps for any domestic production and have been implemented. Unfortunately these tariff policies have been designed to create the lowest barrier and biggest incentive to invest rather than targeting quality investment. As such they have only managed to raise vehicle prices and attract subsidised SKD assembly which adds no real value to the economy.

As it stands attempting to foster an automotive industry using their current policy framework could quite well end in ruinous costs to government and very limited benefits, other than for the protected assemblers. This is of course not desirable at all. There are a number of policy options which could improve the viability of SSA, or individual countries within it, as an automotive space. The most fundamental of these is a programme creating an integrated regional market and a regional automotive development policy. The possibilities here are most clearly shown by India, which has a comparable population and GDP to SSA but a large automotive trade surplus and high levels of domestic automotive employment.

Any regional automotive strategy needs to be embraced equally by both the hegemon, South Africa, and the region in general. This is only possible with an equitable sharing of the costs and benefits that a regional industry would bring. South Africa has technological capabilities in automotive production but cannot grow further through domestic consumption and is struggling to compete globally. Other countries in SSA have exploding demand but next to no technological capabilities in the industry. This presents a possible mutually beneficial avenue of a regionally integrated industry. Countries in SSA could create a joint automotive market and strategy with South Africa in exchange for assistance in the development of an interlinked regional industry.

If a regional plan is developed or countries try to develop industries in isolation they need to attract the kind of investment that actually establishes the foundation for a sustainable industry to grow on. Otherwise they will be faced with an infant industry that won't grow up, continually requiring extensive support. To achieve this it is best to attract fewer larger investments than a multitude of low value ones. Specifically rather than encouraging low value added SKD assembly to be established, in the hope firms will invest more thoroughly

and create CKD assembly at a future date, CKD investment attraction should be the goal from the start. This requires more active courting of OEMs and a tariff structure that penalises SKD and FBU imports equally. As the industrial capabilities in much of SSA are limited by factors outside of a firm's control, states will need to alleviate these constraints for a large scale intimal investment to be secured. The best way for countries to do this is to create SEZs where they can concentrate their resources. In this way external barriers to automotive production, such as secure electricity supply and a logistics industry, can be resolved at a localised level. SEZs also encourage clustering and its ancillary benefits which in turn further encourages firms to invest in the country.

Unfortunately these policies are not simple to implement, both due to powerful invested interest groups who would not support them and the difficulties inherent in the implementation of complex industrial policy. As such the viability of SSA as an automotive space is anything but certain. It would then possibly be more in the interest of countries in the region to aim slightly lower and foster motorcycle production industries. There is already truly gigantic demand for these in many countries in SSA. These domestic markets would be sure to incentivise investment. Additionally motorcycle technology is more mature and less complex than that of automotive, making low industrial capabilities less of a barrier. Motorcycles can also then be used as a positive stepping stone to value added automotive assembly. Motorcycle production would raise the industrial capabilities of a country so that when they do attempt automotive assembly they do not need to stoop to SKD assembly to attract investment.

It is far from certain that an automotive industry can be successfully established in SSA, or any countries within it, at this point. However, if done carefully it is also far from certain that it would fail. The surest approach is for individual countries to aim lower and first attract motorcycle production and then, once that is established, encourage automotive production as well. This is not the only option and if SSA as a region is able to create a common market and mutually beneficial strategy then, much like India, a powerful industry could well emerge. No matter what it will require careful thought and dynamic policy decisions for SSA to no longer be the last frontier of the automotive industry.

Appendix A: List of Persons Interviewed

Name	Date of Interview	Title
Alec Erwin	8 April 2015	Former South African Minister for Trade and Industry, and Minster of Public Enterprises Director of UBU Investment Holdings and consultant on the Nigerian automotive policy
Justin Barnes	3 September 2015	Chairman B&M Analysts Chair of Industrial Studies, Adjunct Associate Professor at School of Development Studies, University of KwaZulu-Natal
Craig Parker	22 May 2015	Senior Economic Consultant, Frost & Sullivan
Michael Lester	8 May 2015	Chairman of the Africa Export Forum

Appendix B: Data Challenges of UN Comtrade

The most problematic element of UN Comtrade data is that the database does not consistently take into account the flows of cars out of the Middle East, with patchy or just absent data. Tracking these flows is important as anecdotally they are viewed to be very large when talking to those involved in the SSA vehicle trade. In the years of UN Comtrade data that they are reported in, exports are indeed quite significant. For example Oman only has data for 2001 available and in that year it is the largest exporter to SSA by a long way, with huge exports to the former Sudan. However, even excluding Sudan it is second only to the whole EU. Likewise when the United Arab Emirates and Saudi Arabia do supply data they are amongst the top exporters (DESA/UNSD, 2015).

Even when UN Comtrade data is available there are some other issues. One is the possibility that double counting exists if the exports from non-producing SSA nations are included. This occurs where cars have been imported to a nation due to its good ports or low duties and then are counted as exports of that nation to its neighbours. As such these entries have dropped, possibly leading to an under representation of trade. There are also a few nonsensical entries in the UN Comtrade data, most notably; entries showing all of SACU registering impossibly high imports from South Africa in 2010 when South Africa changed its reporting methods.[47] These are adjusted so as to instead be representative of the trends in the data.

Data from sub-Saharan African countries is rife with these kinds of errors, with missing entries or unbelievable numbers. As such rather than relying on the countries themselves to track their imports mirror data from exporters was instead used. The only exception to this was that South Africa's export data was used as it is a vehicle producer.

[47] It is highly unlikely that Botswana, Lesotho, Namibia and Swaziland each imported in (000's) 3 212; 242; 1785 and 985 passenger cars respectively in 2010 and then 8.9; 3.3; 15.7 and 3.1 in 2011. Especially since if viewed as percentages of their populations the 2010 imports represent 160% of Botswana getting cars, 12% of Lesotho, 82% of Namibia and 83% of Swaziland. More likely this is an error due to South Africa not reporting SACU members in its trade reporting until 2010.

Appendix C: Passenger vehicle and LCV HS Codes

Passenger Car Definitions

The categories included in the Harmonised System (HS) code 8703, 'motor cars and other motor vehicles principally designed for the transport of persons', were used to define passenger vehicles for the trade data. The data was accessed at the six digit level for UN Comtrade, so as to exclude non-passenger car vehicles used for carrying people, and the 8-10 digit level for the US, EU and Japanese sources to be able to specify used and new passenger vehicles.

For UN Comtrade database the following HS codes were included:
870321; 870322; 870323; 870324; 870331; 870332; 870333 and 870390

For the Eurostat Comext Database the following HS codes were included
New passenger vehicles: 87032110; 87032210; 87032211; 87032219; 87032311; 87032319; 87032410; 87033110; 87033211; 87033219; 87033311 and 87033319
Used passenger vehicles: 87032190; 87032290; 87032390; 87032490; 87033190; 87033290 and 87033390

For the Japanese Customs and Tariff Bureau database the following HS codes were included
New passenger vehicles: 870321919; 870321929; 870322920; 870323919; 870323929; 870324920; 870331900; 870331920; 870332919; 870332929; 870333920 and 870390900
Used passenger vehicles: 870310000; 870321910; 870321915; 870321920; 870321925; 870322900; 870322910; 870323910; 870323915; 870323920; 870323925; 870324900; 870324910; 870331910; 870332910; 870332915; 870332920; 870332925; 870333900; 870333910; 870390000 and 870390100

For the US International Trade Commission database the following HS codes were included
New passenger vehicles: 8703330030; 8703330010; 8703240030; 8703230010; 8703900000; 8703330045; 8703320010; 8703310000; 8703240075; 8703240060; 8703240050; 8703240010; 8703230075; 8703230060; 8703230020; 8703220000 and 8703210000
Used passenger vehicles: 8703230090; 8703240090; 8703320050 and 8703330085

LCV Definitions

LCV are not recorded separately and are drawn from the category defined as 'motor vehicles for the transport of goods'. This is done imperfectly by assuming that all vehicles in the category with a weight of less than 5 tons are LCVs. The largest exporters into Africa do not record new and used LCVs separately. This meant that the data was drawn from the UN Comtrade data, accessible at 6 digits under the HS, as the nation's individual data bases did not provide any additional information.

For UN Comtrade database the following HS codes were used to define LCVs:
870421 and 870431 both of which are for: G.V.W not exceeding 5 tonnes.

Appendix D: Countries Classified by Area According to AfDB

There are differing views as to which countries constitute the various regions of African. For the purposes of this paper the African Development Bank's definitions of North, East, Southern, Central and West Africa. Sub-Saharan Africa is then an amalgamation of these less North Africa. The countries included in each region are as follows:

North Africa: Algeria, Egypt, Libya, Mauritania, Morocco and Tunisia.

East Africa: Comoros, Burundi, Djibouti, Eritrea, Ethiopia, Kenya, Rwanda, Seychelles, Somalia, South Sudan, Sudan, Tanzania and Uganda

Southern Africa: Angola, Botswana, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Sao Tome and Principe, South Africa, Swaziland, Zambia and Zimbabwe

Central Africa: Cameroon, Central African Republic, Chad, Democratic Republic of Congo, Congo, Equatorial Guinea, Gabon and Madagascar

West Africa: Benin, Burkina Faso, Cape Verde, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo

Appendix E: China Chongqing Big Science and Technology Development Group CKD Assembly Process

Source: Alibaba 2015

Appendix F: Popular Accounts of African 'Henry Fords'

Nigeria - IVM

IVM is the latest and most ambitious project of Innocent Chukuwuma a very well connected Igbo businessman. His elder brother Gabriel Chukwuma, a business mogul in his own right, facilitated Innocent's entry into the Nnewi spare parts cluster through an apprenticeship with one Romanus Eze Onwuka. Romanus was Nnewi's largest importer of motorcycle spare parts in 1978, at the cluster's peak (Vanguard, 2014). With financial assistance from his brother Innocent used the skills he had acquired apprenticing with Romanus and established Innoson Nigeria Ltd. in 1981 to import motorcycle and vehicle parts from Taiwan (Vanguard, 2014). At the time Nigerian firms only imported Japanese FBU motorcycles both new and used (Ufford, 2014).[48] The Naira depreciated steeply in the late 1980s and 1990s which increased the cost of motorcycle imports, slowing demand for spares. Part of the cost issue was that each 40ft container of FBU motorcycles from Japan contained only 40 motorcycles (Vanguard, 2014). In an attempt to increase imports Innocent made connections with the low cost Chinese producers Jingcehng and Jiachi, who produced copies of popular Japanese brands, and got them to break down the motorcycles before shipping (Vanguard, 2014; Ufford, 2014). The motorcycles were then manually recoupled in Nigeria, allowing 200 to be packed into each container (Ufford, 2014). The combined factors of low cost suppliers and lower transport costs meant that Innoson was able to sell new motorcycles at around 50% of the value of other new imports into Nigeria (Vanguard, 2014; Ufford, 2014).

In the 1990se used Japanese motorcycles, known for their quality and relatively low price, truly dominated the Nigerian market and Innoson made some inroads into this market dominance with its lower cost Chinese knockoffs (Ufford, 2014). The firm was able to sell up to 40 000 motorcycles a month at its peak (Vanguard, 2014). Quickly competition appeared as others started to assemble broken down bikes instead of importing FBU motorcycles and shifted to lower cost producers. In response Innocent along with his Igbo backers bought Eastern Plastics a state owned plastics firm located 110 km from Innoson's motorcycle plant (Vanguard, 2014). It was renamed the Innoson Technical and Industries Company Ltd. and refitted with modern machinery to produce the plastics for motorcycles (Aziken, 2014).[49] Producing plastic parts domestically from 2002 allowed Innoson to import 250 motorcycles per container and sell them at below 66% of the cost of a used bike (Vanguard, 2014). This effectively wiped out the second hand motorcycle market (Vanguard, 2014; Abone, 2014; Ufford, 2014).

Success was short lived as increased social pressure to restrict motorcycle numbers in cities and ever cheaper imports from India and China reduced demand for Innoson motorcycles. Innocent's response has been to expand into Innoson into rubber products and vehicle assembly (Vanguard, 2014). IVM, the Innoson group's automotive arm, was founded in 2007, also in Nnewi, and assembly started in 2010 when its factory was opened by then president Goodluck Jonathan (Emmanuel, 2014). It has quickly increased its product line from only assembling buses and pick-up trucks so that in 2014 IVM was assembling 13

[48] The brands were Honda, Suzuki and Yamaha (Ufford, 2014).

[49] The plant has succeeded outside of motorcycle parts, as its capacity was underutilised just for motorcycles other products were added. In 2014 it was producing up to 150 plastics products for variant applications and is an example of ancillary industrialisation (Vanguard, 2014; Aziken, 2014).

different vehicles including SUVs, sedans, buses and dump trucks (Aziken, 2014). Assembly is asserted to be of a CKD nature from spare parts imported from China, with Chinese workers supervising assembly in Nigeria and training the Nigerian technicians (Abone, 2014). Innocent claims that local content exists at up to 60% in Innoson vehicles, which can only be a massive exaggeration, also throwing doubt on his other claims. However, IVM does use the Nnewi cluster to supply parts along with his other firms in the region (Abone, 2014; Ufford, 2014; Emmanuel, 2014; Vanguard, 2014). The Nigerian manufactured components claimed to be supplied include: cabling, lubricants, plastics, batteries, exhausts, upholstery, polymer products, light fittings, tyres and rubber materials (Emmanuel, 2014; Aziken, 2014; Dominic, 2015).

IVM has increased factory capacity twice since its opening in 2010 and now is able to assemble up to 10 000 vehicles a year (Emmanuel, 2014). The firm uses labour intensive practises, such as replacing all automated conveyers with trollies that are pushed from station to station. Innocent embraces labour intensive practises as a way to keep capital and other costs down. He claims the factory is employing over 7 000 people and is not yet functioning at capacity, this again seems like an exceptionally high number (Emmanuel, 2014; Ufford, 2014; Abone, 2014). The brand has seen reasonable success, supplying 6 000 buses to the Nigerian government as well as rapidly selling their 500 vehicle initial offering (Obiukwu, 2014; Mordi, 2015). They claim to have started to export vehicles to Ghana, Benin, Gambia, Sierre Leone and other African nations, although the numbers must struggle to reach double digits for these exports (Dominic, 2015). The entry level passenger vehicle retails at 1 million Naira which is a little over $5 000, making it exceptionally cheap and more affordable than all other new Nigerian vehicles[50] (Mordi, 2015). Alongside IVM, Innocent and other investors established General Tyres & Tubes Ltd. in Enugu. The goal is to produce at volumes capable of supplying all of Nigeria's tire and tube market, the factory is now complete but is currently still in trial production stages (Obiukwu, 2014). Innoson has also established an automotive training school in Nnewi to enable further expansion as well as a network of aftermarket support centres for its vehicles, which would be a first for Nigeria (Emmanuel, 2014).

Ghana – Kantanka

Kantanka Automobile Company Ltd. is the product of ASSTRC an institute owned by a maverick Ghanaian inventor Apostle Kwawo Safo. Over many years he has claimed to have invented a myriad of devices including: clap on clap off televisions, engineless battery powered cars, plastic moulding machines, rocket launchers, excavators, electronic billboards, voltage stabilisers and many, many others fostering great pride amongst the Ghanaians[51] (Buabeng, 2014; Africa Redemption Magazine, 2013). In 1996 at the 19th addition the annual show where he displayed his products Safo displayed an engine block he had cast, this was

[50] The Nissan and Hyundai passenger car being assembled in Nigeria sell for between 1.5 and 1.9 million Naira (The Nation, 2014).

[51] There is a rather fervent personality cult about Safo. A magazine describes him as "… the world's greatest multi-dimentional scientist and technologist of all times and has carried out the greatest philanthropic activity in Ghana." They go on to list amongst his qualities that his is "[the] Most mysterious man on earth. It is practically impossible to comprehend his level of wisdom." There are also claims he can perform miracles such as "…healing the sick; raising the dead; commanding the ground to split open for water and Tilapia to emerge and form a fish pond" (Africa Redemption Magazine, 2014).

the first sign of his automotive aspirations (Buabeng, 2014). By 1998 he displayed a five seater sedan which he claimed was powered with his previously developed engine and named it the Kantanka Saloon and so Kantanka Automobile Company Ltd. (KAC) was born (Buabeng, 2014). In 2006 the Kantanka Onantefo I was revealed, it was a 4-wheel drive sedan (Buabeng, 2014). In 2007 it was upgraded to the Kantanka Onantefo II and the Kantanka Obrempong I a stretch limousine was also displayed (Buabeng, 2014). Producing a plethora of models the firm showcased a total of 12 different models between 1998 and 2013 (Buabeng, 2014). However, production was at the infinitesimal rate of 2 vehicles a year meaning they were only really for display purposes and to create hype about the media savvy Safo (Buabeng, 2014; Owusu, 2015).

This changed in early 2014 when Safo claimed to have secured an investment from an unnamed Chinese firm. This would allow KAC to create an assembly plant which could produce Kantanka vehicles at a commercial volume by 2015 (Owusu, 2015). The assembly plant currently claims capacity to produce 8 vehicles a day, 4 SUVs and 4 LCVs, but can be upgraded to 20 vehicles per day (Yeboah, 2015). The plant is a step away from artisanal production to instead claim to do CKD assembly of Chinese products (Yeboah, 2015). Safo describes that the plant's assembly process involves: welding; a chemical treatment against corrosion; painting, at the in house paint shop where the parts are washed, sprayed and baked; it is then assembled and finally tested for faults (Yeboah, 2015). Assembly is done by over 200 workers most of whom have no formal education. There has been much media hype about the vehicles with celebrities, Al Jazeera and others all punting the vehicles and domestic Ghanaian media houses relentlessly promoting them (Mensah, 2014; Africa Redemption Magazine, 2014a, 2014b, 2014c; Owusu, 2015; BBC, 2015a). However, the price is as yet unknown, they are not available for public purchase and there have also been criticisms that Safo's projects are just re-engineering imported vehicles (Nyavor, 2014; Owusu, 2015). Safo has been successful in painting his detractors as 'un-African' or 'unpatriotic' and his vehicles as inventions of Ghana, produced in the nation, despite the fact that they are really assembled Chinese parts. Safo certainly sees a grander mission with his 'Ghanaian' vehicles describing his mission as: "God called me to show blacks that we have natural resources; so why are we poor?" (Yeboah, 2015).

Mozambique – Matchedje

In Southern Africa, the only indigenous brand making media waves is a rebadging operation in Mozambique. It is called Matchedje Motors and it is the result of an investment by China Tong Jian Investment Company. There are some incredible claims associated with the firm including that they have installed capacity of 30 000 units per annum and by 2020 they will produce 500 000 vehicles a year, which seems quite frankly impossible (Gasnier, 2015). However, the reported investment is large, $150 million if the reports are to be believed, and around 1 000 vehicles can be assembled a year with the goal to increase this to 30 000 'in the next few years' (O Pais, 2014). The only model currently assembled is a Foday Lion F16, rebadged as the Matchedje F16 (Gasnier, 2015).

Appendix G: Membership of key African Regional Economic Communities

Country	SACU	SADC	EAC	COMESA	ECOWAS
Angola		x			
Benin					x
Botswana	x	x			
Burkina Faso					x
Burundi			X	x	
Cape Verde					x
Comoros				x	
Cote d'Ivoire					x
Democratic Republic of Congo		x		x	
Djibouti				x	
Egypt				x	
Eritrea				x	
Ethiopia				x	
Gambia					x
Ghana					x
Guinea					x
Guinea-Bissau					x
Kenya			X	x	
Lesotho	x	x			
Liberia					x
Libya				x	
Madagascar		x		x	
Malawi		x		x	
Mali					x
Mauritius		x		x	
Mozambique		x			
Namibia	x	x			
Niger					x
Nigeria					x
Rwanda			X	x	
Senegal					x
Sierra Leone					x
Sudan				x	
Seychelles		x		x	
South Africa	x	x			
Swaziland	x	x		x	
Tanzania		x	X		
Togo					x
Uganda			X	x	
Zambia		x		x	
Zimbabwe		x		x	

Note: The Southern African Customs Union (SACU) comprising South Africa and its small neighboring countries economies is not listed above.
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