MANUFACTURING LED GROWTH FOR EMPLOYMENT AND EQUALITY
MANUFACTURING LED GROWTH FOR EMPLOYMENT AND EQUALITY
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FOREWORD:

European Union

There is a revived interest internationally in the role of industrialisation in the pursuit of economic development. Claims of a new industrial revolution that might change the geographic patterns of production activities and trade around the world are contributing to this new emphasis on industrial policy.

Developed Western countries like Japan and Organisation of Economic Co-operation and Development (OECD) member state economies have been hit hard by the recent financial crisis and are looking to reindustrialise their economies in an attempt to consolidate recovery and growth.

Despite differences in the economic and socio-political conditions across countries, the policy response to stimulating structural change has tended to be surprisingly similar. The same new upcoming technologies (such as nanotechnologies, clean mobility, new advanced manufacturing technologies) appear as priority objectives in the stated policy objectives of developed economies such as the United States and Japan but also China. The correlation in the objectives sought is also found in the policy tools commonly used to reach them: Improving skills, publicly sponsored research and development and sectoral support in the form of direct or indirect subsidies.

As history and evidence show, the success of these interventions varies considerably across countries and even over time within a particular country. This seems to suggest that there is no “single right” formula applicable anywhere and anytime. If this is true, each and every country needs to find its own formula and to put in place the institutional, technical, economic and social factors which are appropriate in a given context. Success and failure may also hinge not just on “what” is done but also on “how” it is done.

The European Union (EU) is not a single industrial system. It is the result of the union of multiple national and regional systems operating in a single integrated market with different levels of performance. But these national and regional systems are different and they are not necessarily integrated in the same value chains.

Labour market conditions, technological and regulatory conditions have an impact on the productive activities of firms in different ways across and even within the same country. It is also important to keep in mind that the EU Treaty establishes clearly that industrial policy is a national strategy that should be coordinated at the EU level. In this context, a challenge for EU industrial policy is identifying those factors that contribute to improving the industrial and economic performance of the EU as a whole, while maintaining country-specific domestic objectives.

The European industrial policy has changed over time, adapting itself to the conditions at particular stages of the consolidation of the EU. This has contributed to some remarkable achievements. For instance, the creation of the GSM standard for mobile telephony in the late 1980s and early 1990s allowed Europe to take the lead in this sector at the global level. Reaching a consensus among stakeholders at the economic, political and social levels was a critical factor in that success.

Currently, Europe is undergoing efforts to reindustrialise its economy. The European economy intends to improve integration into global value chains with the aim being to trade and invest in raw materials, manufactured goods and services. This has the potential to contribute towards potential growth both in the EU and in the international arena.

Exchanging information and experiences on industrial policy has become a necessity in the economy of the 21st century. There is a significant shift towards a multipolar economy with more advanced economies competing at a global scale. If this trend is confirmed, new global governance arrangements will be needed to provide stability and legal certainty in such a global economic environment. The exchange of information on industrial policy issues is a useful first step in that direction.

This EU – South Africa conference on Manufacturing led Growth has created a new framework for the exchange of experiences and cooperation on industrialisation, an area that is certainly capable of delivering higher growth rates, more jobs, stability and equity for the European and South African economies.

Francisco Caballero-Sanz
FOREWORD:
THE FUTURE OF MANUFACTURING IN SOUTH AFRICA

Department of Trade and Industry

The debate on whether countries need to follow the traditional path of industrialisation in order to achieve sustainable development has been based on the argument that there is a growing share of production and employment that is accounted for by the services sector and the position that developed countries now find themselves in.

Countries such as Brazil, Singapore, Taiwan, China and Indonesia present success stories of manufacturing led growth over a sustained period of time, with positive results evident in improved GDP per capita. These cases illustrate that achieving development stimulated by industrialisation requires strategic policies that provide an enabling environment and incentivise the private sector to increase the production of diverse manufactured products. In these cases, various policies were implemented to support manufacturing led growth which involved the ring-fencing of capital to strategically support industry; various reciprocal control mechanisms and incentives to support industry; the use of exchange rate and interest rates; and the protection of the domestic market from foreign competition.

Equally within developed countries there is renewed discussion and recognition of the importance of industrial policy to support the growth of the manufacturing sector.

In South Africa, manufacturing and value added services remain the core driver of direct employment with strong linkages to the rest of the economy. South Africa experiences high levels of unemployment and inequality and an important tool to address these challenges and grow the economy is through industrial policy.

The Industrial Policy Action Plan (IPAP) is a mechanism through which the government is able to direct and focus its interventions. It is therefore essential that a context-specific and nuanced understanding is developed of the direct and indirect linkages as well as the dynamic impact through which the growth of the manufacturing sector can stimulate employment across the South African economy.

This EU-SA conference provides a platform to facilitate dialogue and the sharing of experiences that are required to create informed and appropriate policy responses for achieving development. In devising appropriate polices to support inclusive industrialisation, it is necessary to understand and examine South Africa’s industrial structure in the context of the global economy. Post-1994, South Africa integrated into the global economy and trade was to a large extent liberalized, which had the advantage of creating high levels of competition and innovation but exposed the domestic market to shocks at a time when coherent and strategic policies to support a historically complex industry had yet not been fully implemented. For several manufacturing industries this exposure resulted in excessive job losses at a time when South Africa needed to absorb a young population entering the job market and the country needed to address extreme levels of inequality.

Given South Africa’s industrial structure, an improved approach to understanding the relationships and linkages between sectors, employment, capital and the constraints to manufacturing led development is required in order to achieve structural change that generates sustainable and employment intensive growth.

Garth Strachan
Department of Trade and Industry
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INTRODUCTION: MANUFACTURING LED GROWTH FOR EMPLOYMENT AND EQUALITY

This volume contains papers submitted to a conference on Manufacturing Led Growth for Employment and Equity that was held in Johannesburg, South Africa, in May 2014. The conference was sponsored by the Economic Development Department and the Department of Trade and Industry together with the Trade and Industrial Policy Strategies (TIPS) research institute and the European Union’s Partnership Fund.

The conference had a twofold aim. First, it sought to encourage reflection about whether and how South Africa’s unusually high joblessness and inequality should affect our understanding of the role of manufacturing in economic development. Second, it aimed to promote research to evaluate the direct and indirect impact of manufacturing on employment, equality and growth, both in South Africa and internationally.

Almost all the presenters agreed that one of the main problems is that in South Africa manufacturing has been losing jobs since 2008 while shrinking substantially as a percentage of the GDP from 1994. Some inputs also raised concerns about growing foreign ownership of manufacturing companies and the dominance of a very small number of companies in total exports.

That said, the conference discussions indicated a broad agreement that manufacturing development affects inequality and joblessness most importantly in indirect ways. These indirect effects include:

• Increased demand for intermediate products especially from agriculture and services, which can create employment on a larger scale than manufacturing itself;
• The supply of inputs for other sectors, which can support production and employment creation more broadly;
• The development of a working class with sufficient income to buy mass consumer goods;
• Increased exports, making it possible to reduce the cost of imports including for staple goods and intermediate inputs;
• Spillover effects from the relatively advanced and dynamic technologies used to a large extent in manufacturing; and
• Generation of revenue for the state, which in turn supports improvements in overall socio-economic conditions.

Many of these effects are very broad and hard to quantify, and none of the papers attempted this challenge in detail.

Most participants and papers argued that in response to these realities, policies on manufacturing must do more to maximise indirect effects on joblessness and inequality, as well as supporting more labour-intensive subsectors within manufacturing.

A further challenge noted in discussions was the difficulties facing the global economy since 2008. In general, the paradigm of export-oriented manufacturing that emerged from the 1960s has been challenged by the slowing growth in the global North over the past 50 years.

The conference shared a total of 26 formal presentations, of which 11 were submitted for inclusion in this volume. The papers and debates covered a wide range of topics, with strong participation from government, the research community, business and labour.

Neva Makgetla’s paper provides an overview of the direct impact of manufacturing on employment and equality in South Africa since 1994, with a discussion of the implications for industrial policy. It notes that South Africa still...
ranks amongst the most unequal countries in the world, with a particularly low share of adults with employment by
global standards. A key challenge noted is that manufacturing has been losing jobs from 2008 even as other sectors
have seen employment gains.

Two papers on individual sectors follow. Justin Barnes and Anthony Black provide a detailed assessment of the
Motor Industry Development Programme (MIDP), by far the largest industrial policy intervention in South Africa. The
programme has seen soaring exports and vastly improved competitiveness. But it has also entailed rapid import
growth, it depends on very large tax subsidies, has seen a reversion to foreign ownership of most of the industry, and
has not achieved the scale of production required for sustainability. The authors point to the possibility that current
growth in African markets will lay the basis for more sustainable growth in the future.

Tebogo Makube’s paper on the construction industry underscores the potential of local procurement as an
industrial policy instrument. Targeted procurement maximises the multiplier effect of state spending and can go far
in supporting industrialisation. Increasingly it has become part of the discourse in South Africa on industrial policy.
The paper identifies key potential inputs for South Africa’s large public housing construction programme, and ways
to support their local production.

The third section of this volume presents two papers dealing more generally with the link between manufacturing
and employment creation.

Garth Williams, Shawn Cunningham and Deon De Beer tackle the issue of whether innovation, and by extension
advanced manufacturing, creates or destroys jobs. In addition to an analysis of the international experience, they
consider two examples in South Africa – footwear and high-tech components for aerospace and top-end automotive
producers. Their conclusion is that advanced manufacturing can generate jobs and
career mobility for ordinary workers. For industrialisation to succeed, they argue,
both the state and the private sector need to do more to incorporate innovation.

A relatively short and technical paper by Moses Obinyeluaku and Christopher Sako
shows, through an econometric analysis, that employment in services is more
responsive to changes in output than manufacturing – that is, it has stronger output
elasticity of employment. By extension, employment strategies must look both at more labour-intensive sectors in
manufacturing as well as direct job creation in community and business services and in retail. Again, the indirect
linkages to manufacturing are particularly important.

The fourth part of this volume presents papers on market and enterprise structures.

Nimrod Zalk takes on the widespread perception that mark-ups are high in South Africa. He argues that the data
do not support this argument, and calls for a more nuanced understanding of how ownership structures and rents
affect South African manufacturing.

J. Paul Dunne and Rethabile Masenye tse analyse listed companies to understand the relative dynamics of large and
small companies. Their research shows that smaller listed companies grew faster but also disappeared faster, while
large companies accounted for most employment and ultimately more employment growth. Of course, all of the
listed companies are large for South Africa – the “small” companies in the study have up to R1 billion in turnover and
500 employees. The authors conclude that smaller companies are important for dynamism and entrepreneurship,
but sustained job creation requires policies on larger companies.
The final section turns to international experience. A number of foreign experts participated in the conference, providing a broader context for the discussion of the South African experience.

Humphrey P.B. Moshi argues that growth in Africa is still not linked to a substantial expansion of manufacturing. His article suggests deindustrialisation on the continent, with manufacturing both smaller relative to total production and less diversified than half a century ago. He argues this results from policy failures due in large part to pressure from international development agencies. The key remedy is to forge effective states that can shape institutions, infrastructure and policies to support investment.

Daniel Poon provides a detailed and insightful analysis of China’s achievements and policies in relationship to key sectors for manufacturing development. In this context, he argues that the gap between China’s industrial ambitions and its current capabilities provides a strategic opening for other developing countries as well as a source of ideas for industrial policy.

Eileen Lavery reviews efforts to ensure employment equity on a religious basis in Northern Ireland. She argues that the process of requiring and, through procurement legislation in particular, incentivising equality has led to significant labour market change that has reduced unfair discrepancies in employment for Protestants and Catholics over the past few decades.

Sheereen Fauzel, Boopen Seetanah and R.V. Sannassee present a quantitative analysis of the impact of foreign direct investment on total factor productivity in 17 African countries (not including South Africa) from 1980 to 2010. Their findings suggest both that foreign direct investment supports growth and that growth in itself encourages higher foreign investment. Their conclusion outlines some ideas on how to encourage foreign direct investment, ranging from institutional development to educational reforms.

Milford Bateman’s paper combines international and South African experience. He argues that for-profit financial systems cannot accept the long-term horizons and risks associated with formal small-scale manufacturing. Instead, some form of community-based financing – essentially municipal or co-operative-owned institutions – works best for smaller enterprises, whether existing enterprises or start-ups.

The papers in this volume are published for improved access, but they have not been integrated or substantially edited. In consequence, some of them include apparently divergent data. In many cases, this reflects slight differences in the periods or measures used. In some instances, however, they arise from differences or anomalies in the official statistics, which points to areas that would benefit from further analysis.

A debt of gratitude is owed to the E.U. Partnership Fund, and especially the dti, the Economic Development Department, the Department of Monitoring and Evaluation and especially the Dialogue Facility, for their support for the conference and the commitment to ensuring its success. We also wish to thank the staff of TIPS, who played a central role in managing the process and the conference.

Finally, we wish to thank all the participants and especially the presenters at the conference, as well as the authors who submitted final texts for this volume.

Baba Gqubule
Saul Levin
Neva Makgetla
SECTION 1
Industrialisation and employment creation

MANUFACTURING EMPLOYMENT AND EQUALITY IN SOUTH AFRICA

Neva Makgetla

Abstract

In 2014, South Africa remained one of the most unequal countries in the world, an outlier by global standards. This situation raises questions on how manufacturing affects employment and the distribution of income and assets; and is the traditional industrial-policy paradigm sufficiently geared to supporting inclusive growth? The paper explores these questions in the context of declining employment, slow growth in production, and concentration of ownership in the manufacturing sector. In this context, the share of remuneration in value added rose to unusually high levels. Furthermore, the paper explores the link between manufacturing and job creation and economic equality, as well as how well traditional industrial policy aims fit in South Africa.

The paper argues that the simple linkage often drawn between industrialisation and sustained growth needs to be nuanced to take into account the realities within the manufacturing sector and society in South Africa. In particular, more should be done to understand what leads to stark wage inequalities in manufacturing and identify options for addressing them in order to reverse the current trend of job losses in manufacturing, through a shift to light industry and expansion into regional markets as well as enhance indirect employment effects.
1. INTRODUCTION

In 2014, South Africa remained one of the most unequal countries in the world, an outlier by global standards in both overall inequality as measured by the Gini coefficient and levels of joblessness. For proponents of industrialisation as central to long-term development, this situation raises two questions.

- First, how does manufacturing as presently constituted affect employment and the distribution of income and assets directly and indirectly?
- Second, is the traditional industrial policy paradigm sufficiently geared to supporting inclusive growth?

The next section of this paper explores the first question. In the event, employment in manufacturing fell from 2008 to 2014, despite (rather slow) growth in production. Ownership in manufacturing was concentrated by international standards, especially in steel and chemicals, while wage inequality was pronounced. In this context, the share of remuneration in value added rose to unusually high levels.

These trends, while worrying, were not the complete picture. They do not tell us how manufacturing indirectly supported job creation or economic equality. These effects range from production of inputs for processing to demand for goods and services, from manufacturing workers to technological spillovers and tax and export revenues. The trends within the industry indicate the need for a stronger conceptualisation of how manufacturing affects overall growth and employment.

That, in turn, raises questions about how well traditional industrial policy aims fit into the South African context. The concept of industrial policy has been shaped by East Asian countries that started with relatively high employment levels, largely in smallholder farming. They generally achieved fairly equitable economies and societies in the 1950s, in a context of low productivity and incomes. As a result, measures to raise productivity translated into higher incomes for most working people, making industrial policy politically and socially sustainable.

In South Africa, in contrast, a similar approach to prioritising productivity and encouraging higher-technology industries seemed unlikely to alleviate joblessness or address workplace inequalities. As a result, it could not prevent workplace and community conflict and remained subject to persistent policy contestation. That in turn weakened both policy coherence and the mobilisation of resources for innovative investments.

In sum, the simple linkage sometimes drawn between industrialisation and sustained growth needed to be nuanced to take into account the realities of manufacturing and society in South Africa. In particular, more should be done:

- To understand and reverse the current trend of job losses in manufacturing, including through a shift to light industry and growth in regional markets, and to enhance indirect employment effects; and
- To understand what leads to stark wage inequalities in manufacturing and identify options for addressing them.

2. MANUFACTURING INEQUALITY

The available evidence shows that in the period 2000 to 2010, South Africa remained one of the most inequitable economies in the world. That inequality was underpinned by a combination of high levels of unemployment, unusually inequitable wage systems, and concentrated ownership. Manufacturing mirrored and contributed to this broader picture through slow employment growth, with job losses from 2008 to 2014; relatively unequal pay scales; and the dominance of a relatively small number of companies.
While the evidence clearly points to high levels of inequality by international standards, it does not permit an accurate analysis of changes since the transition to democracy. Before 1994, statistics on employment and incomes, including the Census, largely excluded Africans. After the transition to democracy, it took time to develop statistical systems that could generate more accurate information. As a result, consistent and reliable data are available only from around 2002.

This chapter first reviews overall inequality in South Africa. It then explores its immediate causes – unemployment combined with unusually unequal wage structures and ownership.

2.1 Overall inequality

Of the 90 countries that reported a Gini coefficient in the World Development Indicators between 2007 and 2011, South Africa had the second highest figure. That is, it had the second worst distribution of income of the reporting countries.

Moreover, South Africa was an outlier. For the 90 reporting countries, the average Gini coefficient (weighted by population) was .41. For South Africa, the Gini reported in 2009 was .63. As the following chart shows, only three of the 90 countries in the group reported coefficients in this range.

\[ \text{FIGURE 1: NUMBER OF COUNTRIES WITH GINI COEFFICIENT IN 5% RANGES, FROM .25 TO OVER .6, 2007 TO 2011} \]

Source: Calculated from World Bank (2014)

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1 Efforts to evaluate trends since 1994 essentially rely on divergent or inadequate data sources to try to piece together a picture. In a paper for the OECD, Leibbrandt, Wegner and Finn (2010) makes somewhat sweeping statements about trends in inequality based on a combination of academic surveys of under 10 000 households each for 1993 and 2008 and the official 2004 General Household Survey of over 30 000 households. While the paper assesses whether the surveys used comparable questions on income, it does not evaluate their reliability or the comparability of their sampling methods. In the event, the 1993 survey developed a sampling framework based on the highly incomplete 1990 Census, which excluded the “Independent” Bantustans. That made the weighting of the study more difficult. In addition, it most likely under-sampled the high income group. Bhorat, Leibbrandt, Maziya, Van der Berg and Woolard (2009) and Bhorat and Van der Westhuizen (2010) use the official Income and Expenditure Surveys for 1995 and 2005 to conclude that income distribution worsened from 1995 to 2005. While these surveys purport to form a series, they used very different methodologies, which makes comparability difficult. As Bhorat et al. (2009) points out, for instance, the 1995 survey apparently underestimated income from informal employment in poor households (Bhorat et al. 2009:19). Again, the main concern is that the 1995 survey may well have failed to capture realities for Africans in particular. Van den Berg et al. (2006) uses the All Media and Products (AMPS) survey, which is a private survey for marketing purposes, to conclude that the overall income distribution remained essentially unchanged from 1994 through the mid-‘00s. While AMPS has reported continuously since before 1994, the paper does not assess the representivity of its sample or the accuracy of responses, especially for very poor African households that have traditionally been excluded from marketing efforts in South Africa.
The immediate factors behind South Africa’s profound inequalities lay in low levels of employment, unusually inequitable pay scales, and concentrated ownership, all of which were entrenched by apartheid. The following sections consider how each of these factors appeared in manufacturing.

2.2 Employment and manufacturing

The preferred measure for joblessness is the employment ratio, which Statistics South Africa also calls the absorption rate. It measures the share of working-age individuals who say they are employed. In contrast, the unemployment rate defines as unemployed only those who do not have a paid job but want one. As a result, while it provides important information about the unmet demand for paid work, it is not particularly helpful in understanding household incomes.

At the time of the transition to democracy in 1994, the employment ratio was just under 40%, compared to an international norm of around 60%. Since then, job growth has been relatively strong, at around 2.5% a year. As a result, the total number of people in employment climbed from about nine million in 1994 to just over 15 million, although as noted the data for the 1990s are contested. By 2008 the employment ratio climbed to 45%. The Great Financial Crisis saw the loss of a million jobs, however, and pushed the employment ratio back down to 40%. Employment returned to over 15 million at the end of 2013, but the employment ratio remained at around 40% as a result of population growth.

**FIGURE 2: EMPLOYMENT RATIO FROM 1970 (A) TO 2013**

<table>
<thead>
<tr>
<th>Year</th>
<th>Employment Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>60%</td>
</tr>
<tr>
<td>1980</td>
<td>50%</td>
</tr>
<tr>
<td>1991</td>
<td>40%</td>
</tr>
<tr>
<td>1996</td>
<td>30%</td>
</tr>
<tr>
<td>2001</td>
<td>20%</td>
</tr>
<tr>
<td>2007</td>
<td>10%</td>
</tr>
<tr>
<td>2013</td>
<td>40%</td>
</tr>
</tbody>
</table>

**Notes:** (a) Before 1996, the Census did not fully cover Africans, providing only a large survey in 1970 and excluding those in the Transkei, Bophuthatswana, Venda, and Ciskei (TBVC) from 1980. Furthermore, the estimates assumed that almost all adults in the former Bantustans were employed as subsistence farmers if not otherwise. The figures here therefore represent estimates based on reinterpretations of the available data in line with more standard definitions for employment.

As the following charts show, using a characterisation originated by Palma (2010), from 1994 to 2008 South Africa was more or less at the norm for GDP growth, and better than the norm for job creation. Job losses in 2008 combined with a sharp economic downturn and relatively slow recovery meant that from 2008 to 2012 it lagged other middle-income economies in both aspects. Employment surpassed 2008 levels only at the end of 2013.

**FIGURE 3:** COMPARISON OF EMPLOYMENT AND GDP GROWTH FOR VARIOUS MIDDLE-INCOME COUNTRY GROUPS, 1994 TO 2008 AND 2008 TO 2012 (A)

Notes: (a) MIC refers to middle income countries. Professor Gabriel Palma provided the graphic approach, which he utilised in an input at the Competition Commission conference in Johannesburg in September 2014. (b) The data for all countries were standardised to ensure similar age ranges and definitions of employment in the original source, the ILO’s Key Indicators for the Labour Market (KILM). The result was that employment in 1994 for South Africa was reported at over 10 million, compared to national estimates of around 9.4 million. Furthermore, the employment figures for 2008 and 2012 are both lower than in national sources. For this graph, the national data for South Africa are used.


The unemployment gap after 1994 could be understood in terms of the employment structure left by apartheid policies, particularly pushing people off their land. From this standpoint, the key difference between South Africa and other middle-income economies emerged in the very small share of employment in agriculture, at under 10%, although 30% of the population lived in the rural areas. As a group, middle-income economies averaged almost 40% in agricultural employment.

The shortfall in agriculture was partially compensated by an unusually large share of services and retail employment. In contrast, employment in industry in South Africa was more or less at the norm for middle-income countries. Some 24% of employment was in industry, which includes mining as well as manufacturing, compared to an average of 22% for middle-income countries as a group.
While overall employment recovered after 2008, manufacturing employment continued to decline from 2008 through 2014. It was the only sector that continued to lose jobs after the third quarter of 2010. As a result, its share in total employment dropped from 14% in 2008 to 12% in 2012.

Sources: Except for South Africa, calculated from the World Bank World Development Indicators Series on middle and high income economies, percentage employment in agriculture, industry (includes construction, logistics and mining as well as manufacturing) downloaded from databank.worldbank.org in April 2014. For South Africa, calculated from Statistics South Africa Labour Market Dynamics 2010 Series on employment by main industry.

FIGURE 6: EMPLOYMENT BY MANUFACTURING INDUSTRY, 2008 TO 2013

Notes: (a) Non-metallic minerals, metals and fabricated metal products, petroleum and basic chemicals. (b) Excludes heavy chemicals and petroleum.


The fall in manufacturing employment followed a particularly sharp drop in output in 2008/9, with a lacklustre recovery from 2009 to 2013. Manufacturing production grew relatively strongly in the commodity boom of the ‘00s, rising by 5% a year from 2003 to 2008. In 2009, in the Global Financial Crisis, it contracted by 10%, the sharpest fall of any sector in South Africa. Thereafter, following an initial 5% recovery in 2010, it saw declining growth, dropping to under 1% in 2013. As a result of these trends, the share of manufacturing in total value added fell from 18% of the GDP in 2003 to 10% in 2013.

FIGURE 7: PERCENTAGE CHANGE IN PRODUCTION IN MANUFACTURING AND THE REST OF THE ECONOMY, 2003 TO 2013

2.3 Earned incomes

Earned incomes in South Africa overall were unusually inequitable by global standards, and manufacturing itself was more inequitable than the rest of the economy. From the early ‘00s, the data suggest that the share of remuneration, including for managers, in total value added in manufacturing climbed to high levels by global standards.

The ILO benchmarks inequalities in pay for employees (excluding employers and the self-employed) by comparing the pay of the 90th percentile of income earners to the 10th percentile. It published recent reports for only 37 countries, but even in this limited sample, South Africa showed much greater pay inequality than the norm, as the following chart shows. The average ratio, weighted by population, was seven for high-income economies and nine for middle-income countries. For South Africa, it was 21 for formal employees only (excluding informal, domestic and farm workers) and 23 for all employees.

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**Figure 8: Ratio of 10th to 90th Percentile of Wage Earners, Employees Only, 2009 to 2013 (A)**

Notes: (a) Latest data available for countries between 2009 and 2013. (b) Averages weighted by population.


Sectoral inequalities are generally lower than for the economy as a whole, where low-wage sectors such as domestic and agricultural work are effectively compared with high-wage, high-skill industries such as the financial sector. Nonetheless, manufacturing was amongst the more inequitable sectors. As the following chart shows, the ratio of wage inequality was 19 in manufacturing, making it third most inequitable amongst major sectors.
TABLE 1: RATIO OF 10TH PERCENTILE TO 90TH PERCENTILE OF WAGE EARNINGS (EMPLOYEES ONLY) BY INDUSTRY, 2013

<table>
<thead>
<tr>
<th>Sector</th>
<th>Wage ratio</th>
<th>Median wage</th>
<th>Number of employees (000s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>5.1</td>
<td>1,733</td>
<td>688</td>
</tr>
<tr>
<td>Mining</td>
<td>10.7</td>
<td>6,000</td>
<td>411</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>19.1</td>
<td>3,588</td>
<td>1,598</td>
</tr>
<tr>
<td>Construction</td>
<td>18.5</td>
<td>2,700</td>
<td>861</td>
</tr>
<tr>
<td>Trade</td>
<td>14.2</td>
<td>2,900</td>
<td>2,193</td>
</tr>
<tr>
<td>Business services</td>
<td>19.0</td>
<td>4,000</td>
<td>1,776</td>
</tr>
<tr>
<td>Community and social services</td>
<td>27.7</td>
<td>6,000</td>
<td>3,065</td>
</tr>
<tr>
<td>Private households</td>
<td>5.0</td>
<td>1,290</td>
<td>1,226</td>
</tr>
<tr>
<td>Utilities/logistics</td>
<td>22.5</td>
<td>4,100</td>
<td>892</td>
</tr>
</tbody>
</table>

**Source:** Calculated from Statistics South Africa Labour Market Dynamics 2013, series on employee earnings and main industry.

The unusually stark inequalities in wages in South Africa generally reflected the impact of apartheid work organisation. For decades, work was organised to provide “European” pay for skilled (white) workers, while deskilling and reducing pay for the majority. This system was linked to limitations on education, training and career-pathing for most black workers.

The system incorporated racial disparities in job titles, pay and promotions. As the following chart shows, in manufacturing in 2013, 30% of skilled production workers were non-African, compared to 23% in the rest of the private sector and 27% in the public sector. Two-thirds of managers in the private sector were non-African.

**FIGURE 9: PERCENTAGE OF AFRICANS EMPLOYED IN MANUFACTURING COMPARED TO THE REST OF THE PRIVATE SECTOR AND THE PUBLIC SECTOR, 2013, BY OCCUPATION**

**Source:** Calculated from Statistics South Africa Labour Market Dynamics 2013, series on population group, main occupation, nature of employer and main industry.

In 2012, the COSATU Workers Survey included 350 workers in manufacturing unions. In this sample, 45% of African workers said that their employers discriminated against workers based on race, and 37% said black workers were abused on the job (calculated from COSATU 2012).
FIGURE 10: SHARE OF AFRICAN UNION MEMBERS WHO SAY THAT THEIR EMPLOYERS DISCRIMINATE AGAINST OR ABUSE BLACK WORKERS ON THE JOB, 2012

Source: Calculated from COSATU (2012), specifically the questions relating to employer discrimination and abuse.

2.4 Access to assets

Ownership of productive assets in South Africa was also relatively concentrated, but as is often the case, the data were weak on this topic. While the implications for pricing and productivity have been explored quite extensively (see Fedderke & Simbanegavi 2008; Economic Analysis Directorate of the Gauteng Treasury 2009), there has been less analysis of the impact on inequality and employment conditions.

In manufacturing, commodity-based and heavy industries were generally dominated by a few large companies. Steel and heavy chemicals were mostly in the hands of former state enterprises that had been privatised but retained a dominant market position. In addition, the processing of staple foods and beverages was centralised compared to most countries because of the way the apartheid state regulated the value chain before 1994. In contrast, there were more small producers in equipment assembly, other chemicals and plastics as well as clothing and some types of food production.

Despite concentrated ownership overall, the share of remuneration in manufacturing value added increased sharply from the mid-’00s, reaching almost 70% - an unusually high level by global standards – in 2013. As noted, remuneration in manufacturing was highly skewed, and it is not clear to what extent the increase in overall remuneration benefited ordinary workers or managers.

The trend in remuneration relative to value added suggests that manufacturing employers bore much of the burden of the Global Financial Crisis in 2008/9. In contrast, in the rest of the economy, the share of remuneration remained almost unchanged at under 45% from 2008 to 2013.
2.5 Manufacturing equality and employment?

Industrialisation is without doubt crucial for long-term development in South Africa. The available evidence, however, shows that its direct contribution to equality in incomes and assets as well as to job creation, which are equally critical for sustainable growth, has remained limited over the past 20 years.

That conclusion does not say anything about the indirect effects, which are probably more important and positive (Tregenna 2007). Furthermore, understanding the contribution of manufacturing is hindered by the weakness of data on subsectors within manufacturing as well as information on ownership.

The inequalities in the workplace, specifically in manufacturing, in themselves threatened industrialisation. Month-long disputes in the metals industry in both 2013 and 2014 saw a fall of around 30% in auto production. Strikes in the platinum mines led to a sharp fall in exports and slower overall economic activity. In the event, the median income for employees in both industries was close to twice as high as the median for the economy as a whole. That suggests that workplace conflict reflected poor middle management, continued discrimination in the workplace and deep workplace and social inequalities rather than simply inadequate pay (Makgetla 2014).

The following section discusses some implications for industrial policy of high inequality and joblessness.
3. INDUSTRIAL POLICY AND INCLUSIVE GROWTH IN SOUTH AFRICA

From the 1970s, the dominant paradigm of industrial policy was shaped by interpretations of the experiences of Japan, Korea and Taiwan. Other industrial policies were generally evaluated in terms of their divergence or coincidence with these three economies.

As a consequence, understanding of industrial policy generally focused on accelerating exports of manufactures, historically starting with clothing and moving on to equipment and finally the auto industry. It was expected that growth in output for export markets, which were assumed to be virtually limitless for consumer goods in particular, would swamp the productivity effect, so that employment would grow even as costs fall.

Achieving these outcomes requires a focused industrial policy, driven by an active and responsive state that can ensure rising productivity and competitiveness. Academic debates centred on how best to shape incentives, the required private and public institutions, and the role of innovation.

From the early ‘00s, this industrial policy discourse provided a useful contrast to the (nominal) Washington Consensus. Above all, it underscored the need for a strong and interventionist state even where private investment remains the direct driver of the economy.

That said, in the ‘00s South Africa faced a very different situation from that of East Asia half a century ago, when the concepts of industrial policy and the developmental state emerged. The differences in terms of the international economic and political context and regional position can be understood, as well as the nature of the domestic economy. These are described here in schematic form.

In international terms, Asia profited from booming demand for consumer goods in the United States, Europe and Japan from the 1950s. It also benefited economically from high United States spending on the Korean and Vietnamese wars from the mid-1950s through to the early 1970s. Moreover, to encourage anti-communist allies, the United States and Europe provided relatively easy access to their markets for manufactures to East Asian economies through the 1980s.

In contrast, for most of the 1990s and then after 2008, economic growth in the global North was uncertain at best. The Chinese economy grew rapidly, but the country imported mostly raw materials rather than manufactures. As of 2014, moreover, the long term prospects for global growth appeared relatively bleak.
South Africa also faced the challenge of being a latecomer to global markets, as its economy opened up from 1989 with the transition to democracy. As a result, it had to compete with established manufacturing exporters in Asia, and faced constraints on manufactured and agricultural exports to the global North.

In the event, from 1994 imports of manufactures from China in particular surged in the South African market, while South Africa’s share in global manufactured exports stagnated. From 1995 to 2013, South Africa’s share in world manufactured exports fell from 0.33% to 0.29%. Its exports to China climbed almost 40-fold, but its exports of manufactures to China rose half as fast. South Africa’s biggest single export to China in the period 2000 to 2010 was unbeneficiated iron ore. (calculated from UNCTAD 2014, series on manufactured goods and total exports by South Africa and world).

South Africa also had less developed regional partners than those found in East Asia. The ratio of GDP per capita between South Africa and the countries of the Southern African Development Community (SADC) was 7.5 to one in 2011. In contrast, China’s GDP per capita was lower than the average for East Asia and the Pacific, while Brazil’s was just 1.5 times the rest of Latin America and the Caribbean (calculated from World Bank 2014, series on current GDP and population for relevant countries).

In short, South Africa could not count on booming export markets in the global North or the region to drive industrialisation. At the same time, on the domestic scene, high levels of unemployment and inequality made it harder to ensure shared benefits from productivity gains. That in turn hindered efforts to mobilise broad political support for industrial policies.
East Asia had close to full employment from the 1950s. Tenure reform after World War II meant that established smallholders could keep a larger share of their crop, but did not require new market institutions or revised agricultural practices. Their income was often supplemented but not displaced by manufacturing employment, which permitted an initial low-wage strategy.

More broadly, by 1960, the East Asian economies were characterised by relatively equitable income distribution and social cohesion, by class, ethnicity and within workplaces. Equality resulted both from tenure reform and also from substantial investments in education and infrastructure (Campos and Root 1996), which as described in the literature appear to have resembled the proposals in the Reconstruction and Development Programme.

Relatively equitable economies with low levels of unemployment provided a sound basis for industrial policy in several ways. Local markets for mass-produced manufactures were relatively strong, providing a domestic base for growth. Equally important, workers and communities experienced the benefits of growth directly. That made it possible to mobilise a national coalition around industrial strategy and to secure workplace peace.

In this context, it was also easier for government and business to agree on the efforts required for long-term national development. Moreover, given the relatively weak development of mining and agriculture, it was possible to prioritise support for manufacturing. In these circumstances, the state could discipline business without facing threats of capital flight or stirring fears about property rights or excessive over-regulation.

In contrast, the South African economy after 1994 was characterised by:

- Very high unemployment, especially in the rural areas, since colonialism and apartheid effectively replaced African smallholder agriculture with concentrated estate production.
- Unusually deep inequalities by class, within workplaces, and by race, with a well-established and prosperous mining industry accounting for over half of exports.
- Constrained local markets, since poor households could not afford to buy manufactures, especially equipment or clothing, on a substantial scale, while high-income households, which accounted for around half of all consumption, often preferred imports and services.
- Workplace conflict in key industries that, in 2013 and 2014, led to prolonged strikes on a scale sufficient to reduce overall GDP growth.
- Continued domination of industry by white-controlled and increasingly foreign companies, which made it difficult for the state to support national business consistently for both political and ideological reasons.

In these circumstances, efforts to discipline or even incentivise business were often interpreted by business leaders and the media as a threat to private ownership and the market-driven economy. Poor communication and mistrust between the state and business tended to undermine the effectiveness of industrial policy, which often suffered from poorly informed initiatives from the state combined with unconstructive responses from business partners.

In contrast to East Asia, too, the South African state had to bring about a shift from dependence on mining, rather than simply aiming to build up manufacturing. In the event, few mining-based economies have shifted to manufacturing as the lead export or employment sector in the past 50 years.

The extensive differences in starting position for South Africa compared to the paradigmatic countries in industrial policy point to the need to systematically supplement traditional industrial policy prescripts.
From conventional industrial policy, South Africa could take the understanding that:

- Manufacturing is critical to long-run growth and development, although it may not be the dominant source of employment;
- A strong and efficient state is needed that can take the risks associated with thinking ahead of the market, which means accepting that some failures will inevitably occur, while minimising those risks through expertise and responsiveness;
- Industrial policy must bring sufficient visible benefits to the majority to ensure broad political and social support; and
- Government must take a strategic approach to business in order to build trust while continuing to strive for changes in the economy. Achieving this aim requires a realistic vision, consistency and accountability, and a fundamental respect for the fact that in the long term business has to make profits.

At the same time, the following realities in South Africa required innovative responses.

- Given new global conditions, manufacturing by itself was unlikely to scale up enough to solve the unemployment challenge. Rather, industrial policy had to include efforts to maximise employment multipliers. That included not only stimulating employment in supplier and user industries, but also through growth in the labour force; the use of tax revenues; and the diffusion of innovation. Hirschman (1981) and Tregenna (2007) discuss the range of possible linkages and multipliers outside the value chain.
- If export markets for manufactures were likely to remain relatively slow growing and closed, then it became more important to find ways to generate new kinds of domestic and regional demand. The answer was not simply import substitution as understood in the 1960s and 1970s. Rather, the challenge was to identify viable products that could raise living standards and improve productivity for which there might be no demand as a result of deep income inequalities and narrowly focused production. The roll-out of solar water heaters in the early 2000s provides a case in point.
- In this context, support for the development of regional markets became particularly important. Key blockages to trade in southern Africa included weak infrastructure, discordant and often time-consuming regulations and market institutions. It was also important to consider how to develop mutually beneficial value chains in the region.
- Finally, the experiences of 2013/4 in particular demonstrated that the benefits of economic policies must be more equitably spread in order to permit sustained growth. That in turn required more equitable workplaces, especially in manufacturing, as well as broader ownership of productive assets.
Manufacturing Led Growth for Employment and Equality

References

ANCHORING GROWTH AND EMPLOYMENT: The Interaction between Manufacturing and Services in South Africa

Moses Obinyeluaku  
Christopher Sako

Abstract

Manufacturing has been identified as a key marker for growth and employment drivers in South Africa. Yet the sector itself is no longer a major source of employment creation internationally. Using co-integration, this paper assesses the relative importance of the manufacturing and service sectors in achieving long term growth and employment objectives in South Africa. The study finds that both variables are positively related in both sectors of the economy in the long term. However, the elasticity of employment with respect to real output in the services sector appears to be greater than that of manufacturing. For every 1% increase in real output in the services sector, employment increases by 0.86% compared to 0.6% in the manufacturing sector. It suggests that future growth and employment potential of manufacturing requires a structural shift towards more value-adding and labour-intensive manufacturing sectors which are more pro-poor. While a more rapidly growing community, social and personal services, business services as well as wholesale and retail services sub-sectors can unlock the future growth and employment potential of services.

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1. INTRODUCTION

South Africa has one of the highest unemployment rates, one of the lowest labour force participation rates, and exhibits one of the highest ratios of income inequality in the world. One in four South Africans in the labour force is currently unemployed. Of concern is that unemployment is highly concentrated amongst the youth, with 50 per cent of the youth remaining unemployed. In addition, labour force participation at 55 per cent is very low compared to international levels. The low share of individuals who are gainfully employed is one contributing factor to South Africa being one of the most unequal societies in the world as measured by the Gini coefficient, which is currently over .65. Episodes of elevated growth have not been sufficient to establish a declining trend in unemployment.

The New Development Plan (NDP), consistent with the New Growth Path (NGP), seeks to promote sustainable growth, employment and equity. It recognises that the necessary large-scale job creation requires tackling growth constraints. Meanwhile, in South Africa manufacturing has been seen as key for development as well as being an employment driver. According to government’s Industrial Policy Action Plan (IPAP), long term development needs to be underpinned by higher growth in production, led by the manufacturing sector.

Yet manufacturing itself is no longer a major source of employment creation internationally. There are three reasons for this provided in the literature. First is that final demand will increasingly shift to services as income grows, thereby raising the share of employment in service industries (Clark 1951). Second is that the shift will result in greater productivity growth and competitiveness (Baumol 1967, 2001). The final explanation of the rising share of employment in the service sector focuses on the inter-industry division of labour, arguing that manufacturing industries increasingly outsource their service activities to firms specialized in the provision of such services.

Drawing on this, the interaction between manufacturing and services has serious implications for the country’s industrial strategy, and would therefore need to be carefully explored. This paper investigates which sectors could make the greater contribution to future economic growth and employment in South Africa, identifying where the country can have greatest success in capturing high value opportunities based on its key strengths and capabilities. Co-integration analysis is used to estimate the long-term relationship between output and employment for South African manufacturing and services sectors.

Section 2 of the paper sets out certain characteristics of South African manufacturing and service sectors and the ways in which both sectors have evolved in response to increased globalisation. Section 3 discusses the empirical specification. Section 4 presents the results. Finally, section 5 presents conclusions.

2. SOUTH AFRICAN MANUFACTURING AND SERVICE SECTORS: A SYNOPSIS

This section provides some trends between real value-added output, employment, productivity and net export for South African manufacturing and service sectors. The goal is to gain insights into possible growth and employment sector drivers that may emerge from the data. It also offers some background information on the way in which both sectors have evolved in response to increased globalisation.

2.1 Output and employment

As with developed economies, there has been a marked shift in the structure of the South African economy away from manufacturing towards services. This is illustrated in Figure 1. Over time, the shift has been driven by the more rapid growth of services sectors, rather than a contraction in manufacturing output.
FIGURE 1: GVA AND EMPLOYMENT FOR SOUTH AFRICAN MANUFACTURING AND SERVICE SECTORS (2000-2012)

CONTRIBUTION TO OUTPUT (GVA)

CONTRIBUTION TO EMPLOYMENT

ANNUAL % CHANGE IN GVA

ANNUAL % CHANGE IN EMPLOYMENT
Table 1 provides a detailed breakdown of the contribution of different sectors to the South African economy. Between 2000 and 2012, business services, community services and wholesale and retail trade accounted for about 50 per cent of the South African output and 60 per cent of total employment. By comparison manufacturing contributed 18 per cent and 13 per cent to total output and employment respectively.

<table>
<thead>
<tr>
<th>Sector</th>
<th>Sub-sector</th>
<th>Output (GVA)</th>
<th>Change in share</th>
<th>Employment</th>
<th>Change in share</th>
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<tbody>
<tr>
<td>Manufacturing sector</td>
<td>Basic chemicals</td>
<td>13.6</td>
<td>-2.3</td>
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<td>-1.1</td>
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<td>Basic iron and steel</td>
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<td>1.8</td>
<td>48</td>
<td>0.9</td>
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<td></td>
<td>Basic non-ferrous metals</td>
<td>9.4</td>
<td>-3.8</td>
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<td>-0.3</td>
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<td></td>
<td>Machinery and equipment</td>
<td>13.5</td>
<td>2.4</td>
<td>108</td>
<td>1.5</td>
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<tr>
<td></td>
<td>Food beverages and tobacco</td>
<td>45.7</td>
<td>-1.4</td>
<td>226</td>
<td>-1.8</td>
</tr>
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<td></td>
<td>Electrical machinery and app.</td>
<td>7.3</td>
<td>-0.7</td>
<td>38</td>
<td>-2.0</td>
</tr>
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<td></td>
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<td>-2.0</td>
</tr>
<tr>
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<td>-1.5</td>
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<tr>
<td></td>
<td>Motor vehicles, parts and access</td>
<td>21.4</td>
<td>0.7</td>
<td>100</td>
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<td>Paper and paper products</td>
<td>9.3</td>
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<td>2.3</td>
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<td>Textiles, clothing and leather</td>
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<td></td>
<td>Plastic products</td>
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<td>-2.7</td>
<td>46</td>
<td>-2.7</td>
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<tr>
<td></td>
<td>Other manufacturing</td>
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<td>-0.8</td>
<td>441</td>
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<td>Service Sector</td>
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<td>207.2</td>
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<td>1 439</td>
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<td>Community, social and personal serv.</td>
<td>312.7</td>
<td>-0.6</td>
<td>3 168</td>
<td>1.2</td>
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<td>Finance and insurance</td>
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<td>2.9</td>
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<td>1 987</td>
<td>-3.4</td>
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<td>Whole economy</td>
<td>1457</td>
<td>100.0</td>
<td>10 102</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Although the manufacturing sector’s contribution to growth and employment is low compared to services, Figure 2 shows that both sectors exhibited a strong positive correlation in both output and employment.
Evidence suggests that pro-poor growth appears to coincide with low variability in output and vice versa. Figure 3 presents the data for manufacturing and services, using a coefficient of variation. Manufacturing output was highly volatile, compared to services. The volatility is traced to the nature of growth, which is led by commodity exports and the exogenously given prices. While the processes of globalisation introduced many opportunities to developing countries, it also made markets more vulnerable and introduced many economic shocks.

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The volatility is explained by the coefficient of variation in GVA growth, measured by standard deviation over mean ($\sigma / \mu$).
2.2 Productivity

The two main measures of productivity most commonly used are average labour productivity (ALP) and total factor productivity (TFP).\(^4\) Figure 3 shows that in general, manufacturing has higher labour productivity than services (with the notable exceptions of finance and insurance), particularly in basic chemicals, basic non-ferrous metals, and paper and paper products. Consistent with Figure 4, Figure 5 shows that the service sector lags behind the manufacturing sector in total factor productivity, particularly in the recent period.

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\(^4\) ALP is a measure of the value of output generated per employee or hour worked, whilst TFP is a measure of the additional value of output generated after accounting for changes in the raw inputs used (materials, capital, labour etc.). In principle TFP is a better measure of true productivity performance as it controls for a number of factors which also influence sector output, such as capital intensity. However, estimating TFP is difficult and the results are sensitive to the assumptions used.
2.3 Exports

The manufacturing sector accounts for around 53 per cent of South African exports, in particular basic iron and steel, motor vehicle parts and accessories, machinery and equipment and basic chemicals (Table 2). By comparison, services contribute only 16 per cent to total exports, driven by wholesale and retail trade, as well as business services.

Export values do not of themselves give a picture of the net contribution of exports from a particular sector to the economy. Figure 6 details the largest net export sectors in South Africa. It is notable that over the entire period under review, net exports in services is larger than that of manufacturing (with the exceptions of basic iron and steel, basic non-ferrous metals, food, beverages and tobacco, furniture, and paper and paper products).

| TABLE 2: SOUTH AFRICA EXPORTS BY SECTOR (AVERAGE, 2000-2012) |
|---------------------------------|-----|-------|
| **Sector**          | **Sub-sector**          | **Output (GVA)** | **%share** |
| Manufacturing sector | Basic chemicals         | 22.4             | 5.2        |
|                     | Basic iron and steel    | 42.7             | 10.0       |
|                     | Basic non-ferrous metals| 12.5             | 2.9        |
|                     | Machinery and equipment | 23.3             | 5.4        |
|                     | Food beverages and tobacco | 16.4         | 3.8        |
|                     | Electrical machinery and app. | 3.6       | 0.9        |
|                     | Furniture               | 3.5              | 0.8        |
|                     | Glass and glass products | 0.7              | 0.2        |
|                     | Motor vehicles, parts and access | 35.5         | 8.3        |
|                     | Paper and paper products | 6.5              | 1.5        |
|                     | Textiles, clothing and leather | 5.1            | 1.2        |
|                     | Plastic products        | 1.8              | 0.4        |
|                     | Other manufacturing     | 51.7             | 12.1       |
| Service Sector      | Business services       | 10.8             | 2.5        |
|                     | Community, social and personal serv. | 3.3         | 0.8        |
|                     | Finance and insurance   | 8.7              | 2.0        |
|                     | Wholesale and retail trade | 16.2         | 3.8        |
|                     | Other services          | 32.9             | 7.7        |
| Other Sectors       | Other sectors           | 130.18           | 30.4       |
|                     | Whole economy           | 427.6            | 100.00     |
Looking at sector performance over time, South Africa has consistently been a net exporter across all categories of services since 2000, with the exception of community, social and personal services.
3 THE MODEL AND ECONOMETRIC FRAMEWORK

A reduced form of the model of Kaldor’s alternative specification of Verdoorn’s Law is utilised in order to analyse the relationship between output and employment. Verdoorn’s Law postulates that there exists a significant positive relationship between the growth rate of labour productivity and output growth. Verdoorn’s Law and Kaldor’s alternative version of Verdoorn’s Law can be explained as follows:

\[ p_t = \beta_0 + \beta_1 y_t \]  
\[ e_t = \beta_0 + \beta_1 y_t \]

Verdoorn’s Law (3.1)  
Kaldor’s version of Verdoorn’s Law (3.2)

Where \( p_t \), \( e_t \), and \( y_t \) are the growth rate of labour productivity, employment, and output respectively in sector \( i \) of the economy. Given that the focus of this study is to test the long run relationship between employment and output in the manufacturing and services sectors, we use Equation 3.2 in levels in our empirical estimations. Therefore, the long term relationship in levels can be presented as follows:

\[ E_t = \beta_0 + \beta_1 Y_t + \varepsilon_t \]

Where \( E_t \) and \( Y_t \) are the level of employment and output respectively while \( \varepsilon_t \) is the error term. All variables are in natural logarithmic form where the coefficient \( \beta_1 \) is interpreted as the elasticity of employment with respect to real output. According to Kaldor (1975), the sufficient condition for static and dynamic economies of scale such that there is a statistically significant relationship between employment and output growth, requires the estimated coefficient \( \beta_1 \) to be statistically less than unity.

The long term relationship between the level of employment and real output is analysed based on the multivariate approach to co-integration analysis proposed by Johansen (1988, 1995). Accordingly, Equation 3.3 above can be interpreted as a co-integrating relationship between employment and real output. The Johansen approach is based on a stable VAR model of lag length \( p \) and is represented as follows:

\[ y_t = A_0 + A_1 y_{t-1} + A_2 y_{t-2} + ... + A_p y_{t-p} + u_t, \quad t = 1,2, ..., T \]

\[ y_t = (Y_t^i, E_t^i), \quad i = \text{manufacturing or services} \]

\[ A_1 \quad (\text{for } i = 1,2, ..., p) \]

Where \( A_i \) is a parameter matrix for the lagged endogenous variables, \( u_t = (u_1, u_2, ...) \) is a vector of error terms and is assumed to be a zero-mean independent white noise process with time-invariant, positive definite covariance matrix \( E(u_t u_t') = \sum u \). The vector \( A_0 \) represents deterministic terms (i.e. constant, a linear trend and/or dummy variables).

According to the Johansen approach to co-integration, the corresponding VECM for a given VAR in Equation 3.4 is given by:

\[ \Delta y_t = \Gamma_0 + \Pi y_{t-p} + \Delta y_{t-1} + ... + \Gamma_{p-1} y_{t-p+1} + u_t \]

\[ \Pi = -(I_2 - A_1 - ... - A_p) \]

\[ \Gamma_1 = -(A_1 - I) \] and \( \Gamma_2 = -(A_2 + \Gamma_1) \)

\[ \Gamma_3 = -(A_3 + \Gamma_2) ... \]
The impact matrix is given by $\Pi = \alpha \beta'$, where $\alpha$ is a vector of loading coefficients or the speed of adjustment parameters towards equilibrium and $\beta$ is a vector of parameters in the co-integrating relationship.

If the matrix $\Pi$ has row rank equal to zero, then there is no co-integration among the variables $Y$. In particular, if the matrix $\Pi$ has full rank then all linear combinations of $Y$ are stationary and Equation 3.5 would correspond to a VAR model in first differences with no co-integration. If, however, the matrix $\Pi$ is of reduced rank and the rank is not equal to zero ($r \neq 0$) then co-integration exists. As such, the number of co-integrating vectors depends on the row rank of the matrix $\Pi$.

This paper uses the two widely used likelihood ratio tests used to identify a number of co-integrating vectors as suggested by Johansen (1988), namely the trace-test and the maximum eigen-value test, shown below.

$$
\hat{\lambda}_{\text{trace}}(r) = -T \sum_{i=r+1}^{n} \ln(1 - \hat{\lambda}_i) \quad \text{: Trace test}
$$

$$
\hat{\lambda}_{\text{max}}(r, r+1) = -T \ln(1 - (1 - \hat{\lambda}_{r+1}) \quad \text{: Maximum eigenvalue test}
$$

where $\hat{\lambda}_i$ is the estimated eigenvalue from the estimated $\Pi$ matrix

$T$ is the number of usable observations.

4 EMPIRICAL ANALYSIS

4.1 Data

Quarterly South African data on employment and real output over the period 2000Q1-2013Q3 is used, due to data availability on employment which is only available for this period. Data on manufacturing and services sector employment is sourced from Statistics South Africa. Seasonally adjusted real value added is used as a proxy for real output for the manufacturing and services sectors and is sourced from the South African Reserve Bank.

4.2 Unit root test

Before estimating a VAR model, it is important to check the order of integration of the variables. Accordingly, the augmented Dickey-Fuller (ADF) test (Dicky & Fuller 1979) and the Kwiatkowski-Phillips-Schmidt and Shin (1992) unit root test (KPSS-test) were carried out in order to check the stationarity of the variables. The ADF test tests the null hypothesis that there is a unit root against the alternative of stationarity of time series that may have a constant, a deterministic linear time trend and seasonal dummy variables. On the other hand, the KPSS-test tests the null hypothesis that variable is stationary (i.e. $I(0)$) against the alternative that it is non-stationary (i.e. $I(1)$).

In general, both the ADF and KPSS tests indicate that all variables are non-stationary in levels and stationary in first differences, thus confirming that all the variables are integrated of order one ($I(1)$).

5 Despite the KPSS test indicating that employment is stationary at 5% and 10% significance level, we treat employment as non-stationary as per the ADF tests.
TABLE 3: UNIT ROOT TESTS

<table>
<thead>
<tr>
<th>Variable</th>
<th>ADF</th>
<th>KPSS</th>
<th>Conclusion:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>t-statistic (constant)</td>
<td>t-statistic (constant and trend)</td>
<td>t-statistic (constant)</td>
</tr>
<tr>
<td>$Y^m$</td>
<td>-1.54</td>
<td>-2.38</td>
<td>0.80**</td>
</tr>
<tr>
<td>$\Delta Y^m$</td>
<td>-4.76*</td>
<td>-4.77*</td>
<td>0.12</td>
</tr>
<tr>
<td>$Y^s$</td>
<td>-1.61</td>
<td>-0.50</td>
<td>0.88**</td>
</tr>
<tr>
<td>$\Delta Y^s$</td>
<td>-3.44*</td>
<td>-3.79*</td>
<td>0.30</td>
</tr>
<tr>
<td>$E^m$</td>
<td>-2.66</td>
<td>-2.06</td>
<td>0.59**</td>
</tr>
<tr>
<td>$\Delta E^m$</td>
<td>-5.71*</td>
<td>-5.85</td>
<td>0.25</td>
</tr>
<tr>
<td>$E^s$</td>
<td>-0.38</td>
<td>-1.98</td>
<td>0.86**</td>
</tr>
<tr>
<td>$\Delta E^s$</td>
<td>-3.90*</td>
<td>-3.85</td>
<td>0.058</td>
</tr>
</tbody>
</table>

Note: ADF 5% Critical values of -2.91 (constant) and 3.50 (constant and trend) from MacKinnon (1994, Table 20.1). KPSS 5% critical value of 0.463 (constant) and 0.146 (constant and trend) from Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1). *Rejection of null hypothesis at 5% significance level of ADF test. **rejects null at 5% significance level of KPSS test. $\Delta$ indicates the first difference operator.

4.3 Co-integration results

Given that all variables are non-stationary and integrated of the same order, it is possible to investigate short term and long term dynamics in VECM framework. To test for co-integration, two unrestricted bivariate VAR models which form the basis for the VECMs are estimated separately for the manufacturing and services sectors. Control for the recent global economic crisis is done by including a dummy variable corresponding to the financial crisis (2007Q1-2009Q4) in the estimated VAR models.

- **VAR lag length selection − Manufacturing sector:** In order to determine the optimal number of lags for a VAR (p), various lag order selection criteria is used based on a maximum lag order of $P_{\text{max}} = 8$. The Akaike Information Criterion (AIC) and LR-test statistic, Hannan-Quinn (HQ) criterion, Final Prediction Error (FPE) suggest an optimal lag length of two while the Schwartz Information Criterion (SIC) suggests a lag of one for the manufacturing sector VAR model. In order to induce well-behaved error terms, a lag order of two is chosen. In particular the VAR (2) residuals satisfy the normality assumption, and do not show signs of autocorrelation and ARCH effects.

- **VAR lag length selection − Services sector:** Similarly, the Hannan-Quinn (HQ) criterion Schwartz Information Criterion (SIC) suggest an optimal lag length of two while the LR-test statistic, Akaike Information Criterion (AIC) and the Final Prediction Error (FPE) suggest a lag of five. In order to induce well-behaved error terms, a lag order of five is chosen. In particular the VAR (5) residuals satisfy the normality assumption, and do not show signs of autocorrelation and ARCH effects.

Co-integration results are reported in Tables 4 and 5, and are based on the Johansen’s trace test and maximum eigen-value test.
TABLE 4: JOHANSEN CO-INTEGRATION TESTS: TRACE TEST

<table>
<thead>
<tr>
<th>$H_0$</th>
<th>Manufacturing</th>
<th>Services</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>$r = 0$</td>
<td>Trace statistic</td>
<td>Critical value</td>
<td>P-value</td>
<td>Trace statistic</td>
<td>Critical value</td>
</tr>
<tr>
<td>34.16</td>
<td>25.87</td>
<td>0.004</td>
<td>47.07</td>
<td>25.87</td>
<td>0.000</td>
</tr>
<tr>
<td>$r \leq 1$</td>
<td>9.64*</td>
<td>12.52</td>
<td>0.144</td>
<td>4.21*</td>
<td>12.52</td>
</tr>
</tbody>
</table>

Note: Critical values from Johansen (1995, Table 15.4). * Significant at 5%.

TABLE 5: JOHANSEN CO-INTEGRATION TESTS: MAXIMUM EIGEN-VALUE TEST

<table>
<thead>
<tr>
<th>$H_0$</th>
<th>Manufacturing</th>
<th>Services</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>$r = 0$</td>
<td>Max-Eigen statistic</td>
<td>Critical value</td>
<td>P-Value</td>
<td>Max-Eigen statistic</td>
<td>Critical value</td>
</tr>
<tr>
<td>24.51</td>
<td>19.39</td>
<td>0.008</td>
<td>42.86</td>
<td>19.39</td>
<td>0.000</td>
</tr>
<tr>
<td>$r = 1$</td>
<td>9.64*</td>
<td>12.52</td>
<td>0.144</td>
<td>4.21*</td>
<td>12.52</td>
</tr>
</tbody>
</table>

Note: Critical values from Johansen (1995,, Table 15.4). * Significant at 5%.

The estimated results of the parameters of the impact matrix $\Pi = \alpha \beta'$ are presented in Tables 6 and 7 with t-statistics in parentheses where the coefficient of employment has been normalised to one. Table 6 presents results for the manufacturing sector while results for the services sector are presented in Table 7.

TABLE 6: MANUFACTURING – CO-INTEGRATION VECTOR AND LOADING PARAMETERS FOR VECM WITH ONE LAGGED DIFFERENCES AND CO-INTEGRATING RANK R=1

<table>
<thead>
<tr>
<th>$\hat{\beta}'$</th>
<th>$E^m$</th>
<th>$Y^m$</th>
<th>$t$</th>
<th>Constant</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>$-0.6$</td>
<td>$0.0009$</td>
<td>0.58</td>
</tr>
<tr>
<td>$[3.8]$</td>
<td>$[1.9]$</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| $\hat{\alpha}$ | | | |
|---------------|-------|-----|
| $-0.8$ | $[-5.2]$ |

Note: t-statistics in parentheses.

TABLE 7: SERVICES – CO-INTEGRATION VECTOR AND LOADING PARAMETERS FOR VECM WITH FOUR LAGGED DIFFERENCES AND CO-INTEGRATING RANK R=1.

<table>
<thead>
<tr>
<th>$\hat{\beta}'$</th>
<th>$E^s$</th>
<th>$Y^s$</th>
<th>$t$</th>
<th>Constant</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>$-0.8$</td>
<td>$0.00003$</td>
<td>3.40</td>
</tr>
<tr>
<td>$[2.8]$</td>
<td>$[0.019]$</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| $\hat{\alpha}$ | | | |
|---------------|-------|-----|
| $-0.6$ | $[-7.2]$ |

Note: t-statistics in parentheses.
The co-integrating vectors have been rearranged in order to obtain economic interpretation as follows:

**Manufacturing:**

\[ E^m = 0.6 \ Y^m - 0.00009t - 0.8 + e_{t-1} \]  \hspace{1cm} (4.1)

**Services:**

\[ E^s = 0.6 \ Y^s - 0.000003t - 3.0 + e_{t-1} \]  \hspace{1cm} (4.2)

Where \( e_{t-1} \) represents the error correction term and is stationary. The results indicate that in the long term, employment and real output are positively related in both sectors. In particular, the long run elasticity of employment with respect to real output is significantly less than unity in both the manufacturing and services sectors, suggesting that for every 1% increase in real output, employment must grow by less than 1% as suggested by Kaldor (1975). According to Kaldor’s second law, the manufacturing sector exhibits static and dynamic economies of scale; however, our results suggest that Kaldor’s second law also applies to the services sector. The result that the services sector also exhibits static and dynamic economies of scale is not unique to the South Africa economy. In their analysis of a sample of Indian states, Dasgupta and Singh (2005) establishes that Kaldor’s first law also applies to the services sector. Our results indicate that the elasticity of employment with respect to real output in the services sector is greater than that of manufacturing. For every 1% increase in real output, employment in the services sector will grow by 0.86% compared to 0.60% in the manufacturing sector. The estimated output-employment elasticity for the manufacturing sector compares fairly with results obtained by Bhorat (2009) but is however lower than the estimates obtained by Fedderke and Mariotti (2002) and Oosthuizen (2006), who estimate it at 0.86% for the period 1970-1997 and 0.76% for the years between 1995 and 2004, respectively.

The rate of adjustment in both sectors is negative and statistically significant. However, employment in the services sector adjusts at a faster rate (i.e. 0.65% per quarter) compared to the manufacturing sector (i.e. 0.58% per quarter). This further suggests that when employment is in disequilibrium due to external shocks, manufacturing employment will take longer to return to its equilibrium level. This is not surprising for the case of South Africa where employment in the manufacturing sector remains sluggish following the recent recession in 2009, while the services sector has to some extent remained resilient.

5 CONCLUSION

A sector-based approach continues to play an important policy role as a tool in the government’s industrial strategy. This paper assesses the relative importance of the manufacturing and services sectors in achieving long term growth and employment objectives in South Africa. The results from the co-integration analysis show that in the long term, employment and real output are positively related in both the manufacturing and the services sectors. However, the elasticity of employment with respect to real output in the services sector appears to be greater than that of manufacturing.

South Africa’s broader exposure to the rest of the world has not in itself induced the necessary structural changes in the economy to significantly alter the export basket beyond the range of products that reflect South Africa’s static comparative advantage in mineral resources and commodities. In order to mitigate further aggravation in manufacturing account deficit and foster future growth and employment potential of manufacturing, a structural shift towards higher growth in more value adding and higher labour-absorbing manufacturing sectors which are more strongly pro-poor is required. At the same time, a more rapidly growing community, social and personal services, business services as well as wholesale and retail services sub-sectors can unlock the future growth and employment potential of services.

The results point towards the direction of future enquiry to better understand the direct and indirect channels through which South African manufacturing growth can impact on economy-wide growth, and stimulate employment creation in the services sector.
References

ADVANCED MANUFACTURING AND JOBS IN SOUTH AFRICA: An Examination of Perceptions and Trends

Mr Garth Williams
Dr Shawn Cunningham
Professor Deon De Beer

Abstract

This paper is part of an emerging body of work on advanced manufacturing in South Africa. Other ongoing work includes:

- The Implementation and Outcomes Evaluation of the National Advanced Manufacturing Technology Strategy, an evaluation undertaken jointly by the Department of Science and Technology and the Department of Performance Monitoring and Evaluation in The Presidency, and

- The Advanced Manufacturing Research, Development and Innovation Roadmap Project, a project led by the Department of Science and Technology in collaboration with the Department of Trade and Industry.
1. **OVERVIEW**

Advanced manufacturing has been recognised globally as being necessary to reverse de-industrialisation and to create decent well-paying jobs. However, lingering perceptions regarding the negative correlation of advanced manufacturing and technological advancement on employment creates resistance to the adoption of advanced manufacturing practices by industry. These perceptions are particularly evident in South Africa against the backdrop of declining employment and falling manufacturing growth as a proportion of national growth, where adversarial management-worker labour relations are contributing to current and projected job reductions through mechanisation.

Combinations of new and old knowledge and technologies (components of advanced manufacturing) are increasingly being recognised as advanced and specialised factors of production to complement traditional factors in the manufacturing sector. Evidence of this can be found in international private sector studies and in the global government manufacturing policy discourse which recognises talent-driven innovation and advanced technologies as the most important drivers of manufacturing competitiveness.

This paper explains how the effects of advanced manufacturing, technological advancement and innovation on employment are far from simple and causal. From a theoretical perspective there is no consensus in academia on the effects on employment, with multiple factors contributing to job creation and job destruction in relation to different types of innovation. The literature also indicates that the effect on jobs varies depending on whether one examines the effects at a firm, industry or sector level. Results also seem to vary depending on the industry or services sector selected.

However, empirical evidence indicates that there is a strong and positive correlation between product innovation and direct job creation in the manufacturing sector, although there seems to be a slightly negative correlation between process innovation and direct jobs. In addition, the proportion of indirect jobs to direct manufacturing jobs increases dramatically as manufacturing becomes more high-technology and advanced due to forward and backward (extensive supply chains) linkages and a sophisticated manufacturing services sector.

Making use of two examples, the paper dispels several entrenched notions regarding advanced manufacturing and jobs. In the first example, it is illustrated how advanced manufacturing could revitalise a low-tech sector characterised by a large number of low-skilled jobs. In the second example, a high-tech firm that is also labour-intensive is presented.

It is imperative for South Africa to embrace and adopt advanced manufacturing approaches alongside conventional manufacturing methods for economic growth, employment and international competitiveness. Talent-driven innovation and advanced technologies need to become more important from the perspective of South African manufacturing stakeholders. The advanced manufacturing of today will become the conventional manufacturing of tomorrow, hence the South African manufacturing sector needs to rapidly embrace and adopt advanced manufacturing approaches in order to improve competitiveness and avoid further job losses and de-industrialisation.

The country has an established manufacturing base and good public-funded science and technology capabilities. What is required is for the public sector, the private sector and labour to work together for the manufacturing sector to become more competitive and thereby grow and create more jobs, and several policy recommendations are made in this regard.
2. INTRODUCTION

South Africa is plagued by persistently high unemployment, increasing inequality and chronic poverty. To ameliorate these challenges the South African government has identified employment-intensive growth as a priority as explained in the New Growth Path, the National Development Plan, and the National Industrial Policy Framework and associated Industrial Policy Action Plans. Furthermore, government has identified manufacturing as a key sector to not only drive economic growth but also to create jobs.

It is well known that the South African manufacturing sector’s contribution to growth and employment has been in decline for decades, which indicates that the sector is becoming progressively less competitive. The competitiveness of local manufacturers has historically been based primarily on traditional factors of production such as cheap electricity, low-cost labour and plentiful raw materials as well as industry protection such as incentives and trade barriers. This historical competitive edge has largely been eroded as the manufacturers’ cost base has risen due to increasing administered prices and wages, without concomitant increases in productivity. South Africa’s economy has also been affected by increased globalisation through being exposed to cheaper imported goods on the open market, with the country’s industrial and trade policy instruments having to be amended in order to be compliant with World Trade Organisation rules.

Locally, government (specifically the Department of Science and Technology and the Department of Trade and Industry) has recognised the importance of developing the country’s advanced manufacturing capabilities alongside conventional manufacturing, and for the economy to transition from being a resource-based economy to becoming a knowledge-based economy through technological innovation (DST 2002, DST 2003, DTI 2002, DTI 2007). The importance of advanced manufacturing and a competitive manufacturing sector underpinned by talent-driven innovation and advanced technologies is also acknowledged by the governments and private sector companies in countries and regions such as the United States of America, the United Kingdom, the European Union and the People’s Republic of China.

However, there are perceptions that the adoption of advanced manufacturing approaches and the use of advanced technologies in the manufacturing sector are associated not only with low employment-intensive growth but also leads to job destruction. These perceptions will be scrutinised and the links between advanced manufacturing approaches and job creation will be examined.

3. GLOBAL MANUFACTURING TRENDS

3.1 Historical trends and the effects of off-shoring

Manufacturing in the last century was characterised by labour-intensive production and heavy engineering, with workers having a narrowly defined skill set and fixed job responsibilities, and such workers were easily obtainable (DBIS 2009, p. 3 and Pietrantonio, Snyder & Stanlick 2013). This mode of manufacturing was dominated by input factors of production (labour, materials, capital equipment and energy) together with achieving greater efficiencies and productivity.

The emergence of globalisation naturally led to the gradual relocation of production to developing countries where lower wages could be paid, raw materials were cheaper and/or electricity costs were lower (Deloitte 2013b, p. 15 and Pietrantonio, Snyder & Stanlick 2013). This trend started with the ‘off-shoring’ of the assembly of low technology (‘low-tech’) commoditised goods such as furniture, clothing and textiles, but has subsequently expanded into medium technology (‘medium-tech’) and even high technology (‘high-tech’) goods like computers and mobile phones as the manufacturing capacity of these regions matured and became more sophisticated (OSTP 2011, pp. 1-2). In many cases the design, research and development (R&D), logistics and distribution remained in the industrialised countries, while the assembly and component manufacturing were outsourced to the lowest-cost producers.
Off-shoring of production has had a significant effect for both developed and developing countries. With regard to developed countries, off-shoring has led to job losses and shrinkage of manufacturing contribution to gross domestic product (GDP). For example, in the United States of America (USA) the contribution of manufacturing to GDP dropped from 27% in 1957 to 11% in 2009, and manufacturing employment shrank from 17.6 million jobs in 1998 to 11.6 million jobs in 2010 (OSTP 2011, p. 1). In addition, the USA’s share of high-tech exports declined from 20% in the late 1990s to 11% in 2008, and the country’s trade balance in advanced technology manufactured products moved from a surplus to a deficit in 2001, with trade deficits of $17 billion and then $81 billion in 2003 and 2010 respectively (OSTP 2011, p. 2).

Off-shoring to developing countries has enabled these countries to not only industrialise and grow, but also to develop high-tech industries of their own. For example, China’s share of world high-tech manufacturing increased from 3% in 1995 to 19% in 2010, with a 50% share in computers, 26% in communications and 17% in pharmaceuticals and semiconductors (Pouris 2012). The country’s trade balance in high-tech products transitioned from a deficit to a surplus position in 2001 followed by a trade surplus of about $13 billion in 2003 and then approximately $130 billion in 2008 (OSTP 2011, p. 3).

Developed countries have also discovered that off-shoring has had unintended consequences. In addition to the loss of low-value jobs in the USA high-tech sector (for example, in assembly), in certain sectors the country has also seen the loss of more sophisticated engineering and advanced manufacturing activities; the loss of knowledge, skilled people and supplier infrastructure; and the loss of investment and employment in manufacturing R&D (OSTP 2011, pp. 3-5). The short-term gains associated with off-shoring of low-tech, labour-intensive manufacturing activities have therefore had a profound long-term impact on the USA’s manufacturing sector from a synergistic and systemic perspective.

Companies are now realising that the historical comparative advantages of cheap labour and materials do not translate into a strategy for sustained and long-term manufacturing competitiveness (Deloitte 2013b, p. 15). In addition, companies have observed rising labour costs in rapidly developing countries like China, higher logistics and transportation costs (due to elevated global oil prices) and increasing risks (stock in transit on ocean-going vessels taking several months to get to market). They have also identified the need for production operations to be closer to the market, having realised the advantages of co-locating production with R&D and expressing concerns regarding product quality (Deloitte 2013b, p. 15 and GOS 2013, p. 25).

These factors, together with the availability of low-cost shale gas in the USA, have led some manufacturing companies to gradually ‘re-shore’ high-tech production back to the USA (Deloitte 2013b, p. 6). Global brands such as General Electric, Motorola, Texas Instruments, Intel and Apple have either announced plans to invest in state-of-the-art manufacturing facilities in the USA, or are actively undertaking such activities. Additionally, firms in the USA are able to counteract high labour costs with high labour productivity (Deloitte 2013b, p. 15). The trend of re-shoring production has also been observed in the United Kingdom (UK) (GOS 2013, p. 25).

During the 2010 USA Congressional Elections both the Republican and Democratic parties attempted to attract voters by accusing their opponents of supporting policies that make it easier for companies to ‘ship jobs overseas’ (Wharton 2011). The Wall Street Journal reported on research conducted by the Massachusetts Institute of Technology in 2012 which showed that firms were under political as well as market pressures to move part of their production back to the USA (WSJ 2012). The American government also realised that off-shoring had left the USA manufacturing sector vulnerable to the 2007/8 Global Financial Crisis, and that it was difficult to create manufacturing jobs in an environment of high unemployment and a de-industrialising economy.

The effects of rising labour costs in China led to China itself off-shoring its labour-intensive manufacturing activities to lower-cost developing countries in recent years (Davies 2012). This trend is set to continue with

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1 Re-shoring or on-shoring “involves the repatriation of production from low-cost locations; investment in onshore production to enhance capability; and sourcing of components from onshore, rather than from overseas” (GOS 2013, p. 25).
forecasts of job losses in labour-intensive manufacturing of up to 85 million jobs by 2022 as a result, together with predictions that China will continue to become a more efficient and higher-value manufacturing country (Ibid). This transition echoes the job losses, off-shoring of labour-intensive manufacturing and a move to advanced manufacturing which took place in Japan in the 1960s and South Korea in the 1980s.

In addition to the emerging re-shoring corporate trends, governments of developed countries and regions such as the UK, the European Union (EU) and the USA have either begun developing policies or have developed policies to re-establish leadership in advanced manufacturing in order to reverse de-industrialisation and create decent, well-paying jobs (GOS 2013, p. 8 and OSTP 2011, p. ii). For example, recent policy recommendations to the President of the USA centre on enabling innovation, securing the talent pipeline and improving the business climate for advanced manufacturing firms (OSTP 2012, p. v). Notably, there is a realisation in the USA that low-cost, basic manufacturing will not regain its former prominence in the country’s economy (Giffi 2012, p. 24). This sentiment is largely echoed in the policy discourse of other developed economies.

3.2 Advanced and specialised factors of production for manufacturing competitiveness

As stated in Section 2.1, manufacturing competitiveness has historically been achieved predominantly through achieving greater production factor efficiencies and higher productivity and efficiencies in an ongoing incremental effort within firms and global supply chains. Porter (1998) explains that for each economic activity, goods are produced with a combination of factors that reflect the factor endowments of the entity in question. Thus, goods that can be produced with a relatively high proportion of labour to capital tend to be manufactured in countries where labour is relatively abundant. Arrow (1999) adds that knowledge is increasingly becoming an important factor of production that affects the ability of firms to remain competitive. While capital and labour are considered private goods, growth is achieved through increases in knowledge.

The importance of non-traditional factors of production are increasingly being recognised (Keeble & Nachum 2002, Porter 1998, p. 78 and Zack 1999). Competitive advantage is dependent on combining new knowledge and improved technologies - the so-called advanced and specialised factors of production (Daniels & Bryson 2002, Di Cagno & Meliciana 2005, Florida 2002 and Powell & Snellman 2004) (see Table 1). These advanced and specialised factors must be integrated into existing industries. Florida (2002) argues that governments now recognize that knowledge, creativity and other soft factors (such as quality of housing, diversity of social activities and the overlaps between different knowledge bases) are becoming more important in driving innovation and the technological upgrading of not only industries, but whole regions. This is part of the reason why innovation seems to emerge disproportionately in urban areas where people from different backgrounds interact. These soft factors are especially relevant for innovation that depends on a talented and highly mobile workforce.

<table>
<thead>
<tr>
<th>Factor type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor conditions</td>
<td>Covers natural resources, climate, location, unskilled and semi-skilled labour, and debt capital</td>
</tr>
<tr>
<td>Generalised factors</td>
<td>Includes the transport system, debt capital and well-motivated and qualified employees who can be employed in a wide range of industries</td>
</tr>
<tr>
<td>Advanced factors</td>
<td>Includes modern communications infrastructure, highly educated personnel such as graduate engineers and computer scientists, and university research institutes in sophisticated disciplines</td>
</tr>
<tr>
<td>Specialised factors</td>
<td>Involves narrowly skilled personnel, infrastructure with specific properties, knowledge bases in particular fields, and other factors with relevance to a limited range or even just to a single industry</td>
</tr>
</tbody>
</table>

2 Adapted from Porter (1998).
Contemporary manufacturing competitiveness is determined by factors such as an appropriately skilled workforce and technological change which results in smarter products and production processes, and also creates jobs that are highly skilled and well paid (DBIS 2009, p. 3, Giffi 2012, p. 24, GOS 2013, p. 8 and OECD 2013, p. 6). At the heart of contemporary manufacturing are technologies such as digital manufacturing, novel advanced materials, nanotechnology, biotechnology, additive manufacturing (AM) and information and communications technologies (ICTs) (ibid). Technologies such as AM have the potential to disrupt traditional supply chains through customisable, on-demand and cost-effective single unit production manufacturing in the consumer’s home. Many of these new technologies are possible because of the way that physical technology is combined with deep knowledge in different fields.

Knowledge does not ‘hang in space’, and is often embodied through a diversely skilled workforce and carried by humans. The more knowledge is codified and becomes ubiquitous and thus easier to access from anywhere, the greater the importance of tacit knowledge shaped by experience and the unique combination of regional factors and the environment in which they interact (Cooke & Memedovic 2006, Cunningham 2012, p. 64 and Fagerberg & Verspagen 2007). Asheim and Gertler argue that the more knowledge-intensive economic activities become, the more geographically concentrated the activities tend to be. This is due to tacit knowledge that is not easily articulated or recorded as it is best shared through face-to-face interaction between partners who already share some basic commonalities (Fagerberg et al. 2005, p. 293). Indeed, one of the true benefits and characteristics of clustering is a concentrated and common labour pool, with workers interacting and sharing knowledge and experience outside the bounds of the firm (such as in social or professional settings.)

A recent survey conducted with international chief executive officers revealed that talent-driven innovation3 is the most important driver for manufacturing competitiveness in countries (Deloitte 2013b, p. 6). Table 10.2 reveals that the traditional direct factors of production are ranked 3rd (labour and materials) and 6th (energy). This is a sign that internationally, companies are moving away from making investment decisions based solely on cheap labour and materials, and that in the long term, strategies for manufacturing competitiveness need to be underpinned by skilled, talented and highly productive human capital and innovation (DBIS 2009, p. 1, Deloitte 2013b, p. 6, Giffi 2012, p. 10 and Kaplan 2007, p. 15).

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**TABLE 2: RANKING OF GLOBAL DRIVERS OF MANUFACTURING COMPETITIVENESS**

<table>
<thead>
<tr>
<th>Index</th>
<th>Rank</th>
<th>Index score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Talent-driven innovation</td>
<td>1</td>
<td>10.00</td>
</tr>
<tr>
<td>Economic, trade, financial and tax system</td>
<td>2</td>
<td>8.42</td>
</tr>
<tr>
<td>Cost and availability of labour and materials</td>
<td>3</td>
<td>8.07</td>
</tr>
<tr>
<td>Supplier network</td>
<td>4</td>
<td>7.76</td>
</tr>
<tr>
<td>Legal and regulatory system</td>
<td>5</td>
<td>7.60</td>
</tr>
<tr>
<td>Physical infrastructure</td>
<td>6</td>
<td>6.47</td>
</tr>
<tr>
<td>Energy cost and policies</td>
<td>7</td>
<td>6.25</td>
</tr>
<tr>
<td>Local market attractiveness</td>
<td>8</td>
<td>3.99</td>
</tr>
<tr>
<td>Healthcare system</td>
<td>9</td>
<td>2.48</td>
</tr>
<tr>
<td>Government investments in manufacturing and innovation</td>
<td>10</td>
<td>1.00</td>
</tr>
</tbody>
</table>

The above finding suggests that nations cannot increase their growth without a talent supply that provides capacity with the appropriate advanced skills and in the requisite quantities (Giffi 2012, p. 12). Hence a nation’s ability to attract, develop and retain talent with advanced skills is not only important but will become an increasingly competitive arena in future.

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3 The two highest sub-components in the survey were ‘quality and availability of scientists, researchers and engineers’ (1st out of 40) and ‘quality and availability of labour’ (2nd). Other sub-components are ‘quality of primary and secondary schools to produce student populations targeted in science, technology, engineering, and math’ (15th), ‘quality of college/university partnerships in research and innovation’ (28th) and ‘effective and efficient immigration policies and processes to attract and retain talent’ (40th).

4 Adapted from Deloitte (2013b, p. 7).
The importance of talent-driven innovation reflects the changed skills requirements of manufacturing globally. In the past, workers would be required to possess technical skills for narrowly defined duties, whereas in future, workers need to have a far broader (multi-skilled) technical competency, undertake knowledge-based work and possess ‘soft’ skills (GOS 2013, p. 22 and Pietrantonio, Snyder & Stanlick 2013).

Manufacturing firms continue to update their equipment and introduce new technologies into the workplace, thus requiring workers with more advanced skills, but there is a serious shortage of appropriately skilled and qualified workers internationally. The industry need for advanced skills is reportedly accelerating for workers across the spectrum from factory floor operators to ‘white-collar’ workers (university-educated), with workers needing not only to acquire advanced skills but to renew and maintain them continuously (Eggers & Hagel 2012).

Internationally on the supply side, lagging workforce development and the fact that the education sector experiences difficulty keeping pace with the skills demanded (i.e. skills rapidly becoming outdated) is contributing to the skills shortage (Eggers & Hagel 2012, IFC 2013, pp. 96-97 and McDougle & Furr 2013a). In South Africa, manufacturing companies are concerned about a perceived decline in the quality of graduates from local higher education institutions, and high-level graduate skills are in short supply (Kaplan 2007, p. 15).

In the USA, 6 million manufacturing jobs have been shed in the last decade, but a recent study revealed that 600 000 manufacturing jobs are unfilled due to companies not being able to secure workers with the required skills (Eggers & Hagel 2012). A shortage of sufficiently skilled labour also exists in the economic sectors connected with the EU’s 6 key enabling technologies (KETs) due to the highly multi-disciplinary nature of KETs. In the area of nanotechnology and photonics, there are estimates that 400 000 and 80 000 additional qualified experts will be needed in the EU by 2015 in the two fields respectively in order to meet the skills needs of the anticipated rapid industry growth together with the expected retirement of skilled workers (EC 2012, p. 6).

Internationally there are an estimated 45 million job seekers joining the labour force each year (IFC 2013, pp. 96-97). However, they need to acquire the right skills to secure a job. The International Finance Corporation estimates that advanced economies will experience a surplus of 32 to 35 million workers without a university education by 2020, with estimates of approximately 58 million in developing countries (Ibid).

The above challenges (demand exceeding supply) in relation to meeting the skills needs of contemporary manufacturing demonstrate the strong correlation between technological advancement and employment in manufacturing. There is also some proof that KETs are facilitating the creation of high quality jobs in small and medium enterprises. In the photonics sector, the bulk of the 5 000 European companies are SMEs (EC 2012, pp. 3-4). In the field of nanotechnology, estimates show that there has been a 25% increase between 2000 and 2008 in the number of workers globally to 160 000, while in the micro- and nanoelectronics industry (and associated downstream ICT industries), more than 700 000 jobs were created in the last decade in Europe (Ibid).

These priorities are reflected in government policy of key countries and regions. For example, the EU has committed €1.2 billion for a “Factories of the Future” research programme to support the re-industrialisation of the region’s manufacturing base (McDougle & Furr 2013b, p. 7). With a budget of nearly €80 billion available over 7 years (2014 to 2020), the EU’s Horizon 2020 framework programme supports the systemic integration of research and innovation activities (but specifically focuses on the KETs of micro-/nanoelectronics, nanotechnology, photonics, advanced materials, industrial biotechnology and advanced manufacturing technologies), thereby facilitating the conversion of knowledge into marketable goods and services (European Commission and EC 2012, pp. 8, 10).

In conclusion, this section underlines the rising importance of the so-called advanced and specialised factors of production (new knowledge and advanced technologies) over the more traditional factors of production (labour, materials, capital equipment and energy). Firms and governments are increasingly acknowledging the increased importance of knowledge (particularly tacit knowledge) and talent. More resources are
being directed towards talent-driven innovation (innovation via a skilled workforce which can produce new knowledge and with the skills to work in a sophisticated manufacturing environment) and the deployment of advanced technologies within firms (with these technologies often brought about through R&D). The increased importance of the combination of new knowledge and advanced technologies are often more visible in the fast growth of hi-tech industries, products and solutions and is particularly visible in urban areas.

The provision of advanced factors of production places different pressures on governments and industries. For governments, the pressure is to create public goods that go beyond the basic factors, and conditions that support experimentation and ongoing learning. This affects issues such as publicly funded research, education policy, structural change and institutional reform. For industries, the challenge is to integrate new thinking, different knowledge domains and new technologies into existing organisations, markets and technologies.

4. TRENDS IN SOUTH AFRICAN MANUFACTURING

It is well-known that the manufacturing sector’s contribution to South Africa’s GDP and direct employment has been in a slow decline for decades. Industry lobby organisations such as the Manufacturing Circle (MC) predict that the situation is likely to persist into the future unless it is addressed in order to improve the sector’s competitiveness (MC 2012, p. 2). A leading financial newspaper suggests that the economy will de-industrialise within the next decade if growth remains slow and the stubbornly high unemployment rate persists (‘Service economy is not enough’ Business Day, 26 June 2013). South Africa’s manufacturing sector can be described as diverse, but the scale of production is low and declining. Many South African manufacturers now depend on supply chains from Asia. South African manufacturers have also been affected by increased import competition and the volatility of the Rand exchange rate.

Rodrik (2006, p. 14) notes that the relative profitability of the South African manufacturing sector decreased by around 30% between 1980 and 2004. It can be argued that the relatively lower profit margins in the domestic manufacturing sector could explain why the sector has struggled to attract widespread foreign direct investment. Elsewhere, Rodrik (2006, p. 9) argues that the manufacturing sector’s inability to create low and semi-skilled jobs was at the centre of South Africa’s unemployment and insufficient growth problems. For instance, Rodrik argues that a strong decline in the relative price of manufactured goods was the predominant cause for the decrease in manufacturing employment (2006, p. 20).

A poll of MC members revealed that overall, manufacturing firms would be reducing their employment levels during the course of 2014 (MC 2013b). Furthermore, a growing portion of the MC member firms that indicated future job cuts expect such cuts to constitute 15% or more of their workforce (ibid). Reasons cited for this trend included a lack of workforce skills, the inability to fill vacancies due to high labour costs, production scale-backs due to “non-competitive pricing”, plant shutdowns due to high fixed costs and subdued demand. Many multinational companies operating in South Africa also bemoan the onerous administrative burden regarding international expert immigration, which makes it difficult to compensate for local skills gaps using mobile international expertise.

Most telling, however, is a self-reported growing trend by manufacturers to mechanise and automate (MC 2013b). This is reportedly due to a volatile and destabilised labour force environment combined with manufacturers’ perceptions that their workers “had a poor attitude to productivity and work in general”, together with high wage increase expectations and the resultant response by manufacturers to protect and maintain their levels of production (Greve 2013). The knock-on effect of the automation trend is job redundancy, but at the same time skills shortages in automation and robotics are being observed and some companies are having to train their staff to manage automated systems (MC 2013a).
The MC maintains that an average manufacturing growth rate of 10% or more is the solution for sustainable long-term and job-inclusive growth (Abedian et al 2011, p. 6). The MC has set four goals in order to achieve such a growth rate and to become more globally competitive, specifically:

- A supportive and investor-friendly business environment;
- Being the gateway for exports to Sub-Saharan Africa but competing with imports on an equal footing domestically;
- Beneficiation of natural resources; and
- Locally-manufactured products being highly-regarded and preferred by South Africans.\(^5\)

The actions recommended in support of these four goals appears to make no mention of improving or enhancing the innovative capacity of the local manufacturing sector through the adoption of advanced manufacturing practices, apart from aiming to “Promote and maintain a skills pipeline”. This is in contrast to the global trends of embracing new knowledge and advanced technologies (advanced and specialised factors of production as per Section 2) in order to create new solutions for old and new problems. These four goals imply that the MC, representing many leading domestic manufacturers appears to have a traditional perspective that sees jobs being created through higher growth, but does not elaborate how this will be brought about.

To illustrate the differences between South African and global manufacturing, a study by Deloitte revealed that South African manufacturers ranked cost and availability of labour and materials, and energy cost and policies 1\(^{st}\) and 3\(^{rd}\) respectively as determinants of manufacturing competitiveness (Deloitte 2013a, p. 10) (Table 3). Internationally manufacturers rank talent-driven innovation as the most important determinant of manufacturing competitiveness, with cost and availability of labour and materials in third place (Deloitte 2013b, p. 6). South Africans rank talent-driven innovation as the 7\(^{th}\)-most important driver of competitiveness in stark contrast to their international counterparts.

This reveals that the historical, low-cost paradigm within South African manufacturers of focusing on the traditional factors of production persists into the present. It appears as though local manufacturers have largely not made the necessary transition to a new paradigm to deal with the effects of globalisation and the removal of protectionist barriers through the inclusion of advanced and specialised factors of production (new knowledge and advanced technology). In order to become globally competitive South Africa’s manufacturers need to focus on being innovative through the adoption of advanced manufacturing practices in addition to being focused on costs.

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**TABLE 3: COMPARING THE SOUTH AFRICAN MANUFACTURING FIRM PERSPECTIVE ON COMPETITIVENESS DRIVERS WITH THAT OF GLOBAL MANUFACTURING**\(^6\)

<table>
<thead>
<tr>
<th>Index</th>
<th>Global Rank</th>
<th>South African Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Talent-driven innovation</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Economic, trade, financial and tax system</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Cost and availability of labour and materials</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Supplier network</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Legal and regulatory system</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>Physical infrastructure</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Energy cost and policies</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>Local market attractiveness</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>Healthcare system</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Government investments in manufacturing and innovation</td>
<td>10</td>
<td>8</td>
</tr>
</tbody>
</table>

\(^5\) Adapted from MC (2012, p. 3).

\(^6\) Adapted from Deloitte (2013a, p. 10).
In response to the steady decline in manufacturing activity, the Industrial Policy Action Plan (IPAP) of the Department of Trade and Industry (the dti) has a target of 2 447 000 additional indirect and direct jobs by 2020 (Davies 2010). Out of this figure, 350 000 direct jobs are projected to emanate from the manufacturing sector (EDD 2011). The IPAP, as well as the Department of Economic Development’s New Growth Path sees an expanded manufacturing sector as the primary and central driver of the economy (DTI 2013), not only for the direct employment-intensive nature of manufacturing, but also because of the sector’s multiplier effects and potential to create a more equitable economy (Coleman 2013).

5. WHAT IS ADVANCED MANUFACTURING?

There is no internationally accepted definition of advanced manufacturing according to a 2010 situational analysis of the South African advanced manufacturing industry commissioned by the dti. The report proposed a definition for advanced manufacturing as a “collection of high value adding manufacturing processes, management techniques, technologies and knowledge capital that occupy the top-tier in manufacturing industries and drive competitiveness in the local and global economies” (Frost 2010). The report furthermore associates a combination of sophisticated computer controls; concentrated bodies of expertise; advanced processes; high value products; processes, products and technologies that are not easily replicable; focused R&D and being industry-leading/industry-changing with advanced manufacturing.

the dti subsequently adopted the above definition of advanced manufacturing, which is reflected in the Department’s 2013 IPAP (DTI 2013). The IPAP furthermore states that high-value goods and services require a minimum set of features, namely, “advanced manufacturing technologies, the development and exploitation of intellectual property (IP), a sufficient IP protection regime and globally competitive financial and support instruments”, and that advanced manufacturing integrates other advanced technologies such as high-performance computing, automation and control systems, high-precision manufacturing linked to intelligent production systems, and sustainable and environmentally friendly processes and technologies (Ibid).

In the USA, the President’s Council of Advisors on Science and Technology defines advanced manufacturing as a group of activities that depend on the use and coordination of information, automation, computation, software, sensing and networking, and/or make use of cutting edge materials and emerging physical or biological scientific capabilities (OSTP 2011, p. ii). Examples of these capabilities include nanotechnology, chemistry and biology. Furthermore, the USA’s definition of advanced manufacturing includes new methods of making existing products or making new products emerging out of new advanced technologies (Ibid). This definition also makes it clear that advanced manufacturing is not a sub-sector of an economy but it describes a cross-cutting activity in the economy.

The Department for Business Innovation and Skills in the UK has a similar description of advanced manufacturing. It categorises businesses that use R&D, new technologies, state of the art equipment, a high degree of design and highly skilled people (including scientific skills) to make technologically complex products, processes and associated services of high value as advanced manufacturing firms (DBIS 2009, p. 1). Furthermore, the Department states that advanced manufacturing is often based on new industrial platform technologies that have multiple commercial applications such as composite materials to replace metals in the shipbuilding, aerospace, car manufacturing and construction sectors, spanning the spectrum from large aerospace companies all the way to small companies created through the spin-out of university research (Ibid). This definition makes it clear that more advanced manufacturing approaches will displace or substitute more traditional manufacturing activities.

The Chinese Academy of Sciences views market analysis, product design, machining, assembly, sales, maintenance, services and recycling as important for advanced manufacturing alongside conventional manufacturing processes (Wang et al. 2010). Furthermore, it believes that future technology development for
advanced manufacturing will be determined primarily by “informationisation” (ubiquitous information) and “greening” (green manufacturing) as well as by globalisation, “intelligentisation” and integration of multi-disciplines. The ubiquitous information theme would be underpinned by technologies such as industrial wireless networks, sensor networks, radio frequency identification and micro-electromechanical systems, whereas the green manufacturing theme entails resource- and energy-efficient manufacturing through pollution reduction and within the entire product life cycle (from design through to recycling).

Elements of the above definitions and descriptions of advanced manufacturing are evident in the Advanced Manufacturing Technology Strategy (AMTS) of the Department of Science and Technology (DST). The innovation pillar of the 2002 National Research and Development Strategy (NRDS) entailed the creation of five technology missions to promote economic and social development, including an Advanced Manufacturing Technologies and Logistics Strategy in support of the dti’s Integrated Manufacturing Strategy (IMS) (DST 2002, p. 42). Importantly, the IMS recognised the need to move from raw material-intensive manufactured goods towards increasingly knowledge-intensive goods and services, supported by the provision of the necessary human capital and appropriate technology strategies to improve the manufacturing sector’s competitiveness (DST 2002, p. 5 and DTI 2002, pp. 28, 30). The IMS also states that South Africa’s future competitiveness will in part hinge on the ability of the manufacturing sector to innovate and to master advanced manufacturing technology domains (ibid).

The AMTS focuses on the technology areas of advanced materials, product technologies, production technologies, logistics, cleaner production technologies and ICT in manufacturing (DST 2003, p. 11) across several industrial sectors. The strategy entailed utilising the science base for human resource development (HRD) and knowledge generation together with industry-focused R&D and technological innovation.

The strategy recommends a focus on manufacturing to achieve higher growth rates to extract greater value from a move to higher value-added manufacturing activities, the export of manufactured goods, and downstream value-addition relating to South Africa’s finite natural resources (DST 2003, p. 6). The ultimate aim of the AMTS is to assist in improving the competitiveness of the South African manufacturing sector via targeted programmes that have an impact on industry development, world-class manufacturing, and innovation and R&D, all underpinned by HRD (DST 2003, p. 12).

For the purposes of this paper, advanced manufacturing is defined as follows:

Advanced manufacturing is an approach that:

- Depends on the use and integration of information, knowledge, state of the art equipment, precision tooling, automation, computation, software, modelling and simulation, sensing and networking;
- Makes use of cutting edge materials, new industrial platform technologies, emerging physical or biological scientific capabilities and green manufacturing philosophies; and/or
- Uses a high degree of design and highly skilled people (including scientific skills) from different disciplines and in a multi-disciplinary manner.

Advanced Manufacturing includes a combination of the following:

- Product innovation: Making new products emerging out of new advanced technologies (including processing technologies);
- Process innovation: New methods of making existing products (goods or services); and

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7 The automotive and transport, cultural and craft, clothing and textiles, metals and minerals, chemicals, aerospace and the capital goods sectors were deemed to hold the greatest potential for growth and impact on the overall SA manufacturing sector at the time (DTI 2002 and DST 2003, p. 11)
8 Primarily an amalgamation of the definitions of Advanced Manufacturing in OSTP (2011) and DBIS (2009), but also incorporating elements of Wang et al. (2010).
9 Such platforms have multiple commercial applications, e.g. composite materials, and exhibit high spill-over effects.
10 E.g. nanotechnology, biotechnology, chemistry and biology.
• Organisational innovation or business model innovation: Combining new or old knowledge and technologies with traditional factors of production\textsuperscript{11} in non-traditional fields or disciplines in unique configurations.

Although some sub-sectors such as biotechnology or genetic engineering are by their very nature more advanced, advanced manufacturing is not viewed as a sub-sector of the economy, but rather as a cross-cutting approach. It can be foreseen that more advanced manufacturing approaches will eventually affect all sub-sectors.

The implication of this definition is that the emphasis should be on ensuring that more of South Africa’s traditional manufacturers embrace advanced manufacturing approaches proactively, or that new and more advanced manufacturers emerge that will challenge traditional incumbents. For government, the priority should be to support the creation of more advanced and specialised factors of production (new knowledge and advanced technologies) (see Section 2), while the private sector should search and exploit opportunities to combine new and old knowledge and technologies to solve existing problems, take advantage of emerging opportunities and fill the gaps that are unique to the regional context. The policy recommendations are elaborated on in Section 9.

6. PERCEPTION OF THE NEGATIVE IMPACT OF ADVANCED MANUFACTURING ON JOBS

When the importance of advanced manufacturing is mentioned in public, some commentators impulsively respond that the increased use of advanced manufacturing approaches is undesirable because it displaces labour. Part of the sensitivity of this topic relates to the incorrect, colloquial (and often interchangeable) use of the terms ‘technology’ and ‘advanced’. While it cannot be denied that new technology often substitutes for labour, we believe that this matter is far more nuanced and should be explored in more detail.

6.1 ‘Promoting advanced manufacturing will replace people with technology’

Intuitively one is inclined to equate technological advances and associated increases in productivity with a concomitant decrease in employment because fewer workers are required for the same production outputs (IFC 2013, p. 18).

In addition, the conventional view is that the benefits of innovation accrue disproportionately to stakeholders that control the distribution channels of inputs and outputs, shareholders, managers and highly skilled workers in technically sophisticated enterprises, with the broader labour pool not benefiting fairly from the benefits (Dutz et al. 2011, p. 3). This view is echoed in local media reports (‘SA’s workers in a parlous state’ Business Day 4 November 2013 and Gleason 2013) of an Organisation for Economic Co-operation and Development (OECD) study which reportedly concluded that rapid advances in technology\textsuperscript{12} are primarily responsible for the steady fall of labour’s share of income since the 1980s in contrast to the increasing gains enjoyed by the owners of capital from productivity gains over the same period.

However, an examination of the primary material (OECD 2012) that the journalists above are reporting on reveals that the report in fact ascribes as much as 80% of the decline in the labour share to total factor productivity (TFP) growth and capital deepening. The authors of the relevant chapter of the OECD report then casually links TFP growth and capital deepening to the replacement of workers with machines brought on by innovation through the spread of ICTs without providing any references in support of this opinion, nor explaining the rationale behind the supposed linkages between cause and effect.

\textsuperscript{11} Labour, materials, capital goods, energy, etc.

\textsuperscript{12} ‘Technology’ in this context includes advances in materials, robotics, communication and computing.
In this particular instance, not only have the authors of the OECD report tenuously linked worker substitution directly with the spread of ICTs, but the local media has misinterpreted this link further and substituted “the spread of ICTs” with “rapid advances in technology”. Such reporting reinforces the simplistic misperception that technological advancement leads directly to job destruction.

The fears that technological change will lead to mass job losses and unemployment have been in evidence since the dawn of the Industrial Revolution. A famous example occurred in the early 19th Century when textile artisans protested against the deployment of stocking frames, spinning frames and power looms, all labour-saving machinery in England.\(^\text{13}\) The main objection of these ‘Luddites’ was that the machinery could be operated by less skilled (and therefore cheaper) labourers, leading to job losses amongst skilled workers.

In South Africa there are persistent perceptions that the introduction of advanced technologies in the manufacturing sector either does not create jobs\(^\text{14}\) or actually leads to job losses through automation (Burger 2012 and Wild 2012). In Wild (2012), Laubscher states that while it is imperative that South Africa develops advanced technologies for the manufacturing sector to be internationally competitive, that these same technologies will lead to job redundancies and would thereby undermine the country’s strategies to address the over-supply of unskilled labour. The Minister of Science and Technology, the Honourable Derek Hanekom (MP) (2013) expressed concerns that technological advancement and innovation may result in job losses and contribute to widening inequality, particularly in light of the high costs of tertiary education.

However, Cunningham, Jacobs and Vorster (2010) found that in the electronics sector there is a strong positive relationship between the use of advanced technologies (and especially highly qualified people) and employment for low-skilled workers. A firm that develops an electronics product with a few engineers could easily create several dozens of jobs for lower skilled workers in a production environment that combines state of the art equipment with more traditional jobs such as assembly, packaging and distribution (see Section 6.2 on multipliers).

It is also important to recognise that manufacturing is not homogeneous as regards the proportion of capital- and labour-intensiveness. Zalk (2014, pp. 4-5) describes three categories of manufacturing that inherently have varying potential for direct employment creation in relation to capital investment, as follows:

- **Primary manufacturing which is inherently capital- and energy-intensive**: These manufacturing operations reside within the ‘Minerals-Energy-Complex’ (MEC) sector and offer little scope to substitute labour for capital. Production entails converting primary resources into semi-processed goods, e.g. steel, chemicals and aluminium. However, the role of such operations is to foster greater employment in sectors that are medium to highly labour-intensive through the supply of intermediate goods.

- **Manufacturing in which capital and labour are complementary**: These operations typically exhibit a concomitant rise in employment with capital investment. Examples include the fabrication of metals and plastics; capital and transport equipment; and parts of agro-processing and the automotive value chain.

- **Manufacturing which is intrinsically labour-intensive**: Examples include the South African clothing and footwear sectors which often experience severe distress as they bear the brunt of increased competition from imported, low-priced, labour-intensive goods due to a massive global increase in unskilled labour. However, employment declines can be arrested and employment gains through a strategic focus on achieving higher quality, reliability and shorter delivery times.

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\(^{13}\) Source: Wikipedia.org.

\(^{14}\) In Wild (2012) Dr Paul Potgieter, the Aerosud Group Managing Director states that high-tech industries cannot be mass employers due to high quality and repeatability requirements which are assured through mechanisation and automation.
6.2 Inconsistent use of terminology, conflation of concepts and incorrect use of terms

Section 4 sought to clarify what is meant by ‘advanced manufacturing’ through proposing a definition for the concept. This section highlights the interrelatedness of the concepts of innovation, technology, knowledge and high-, medium- and low-tech products or sectors, and how they differ from and contribute to an advanced manufacturing approach. While these concepts are interrelated, they are not interchangeable. It is therefore important to take note of this when examining how these factors impact on jobs.

Technology

The commonly-held understanding of technology narrowly refers to technical artefacts (typically consumer electronics such as smartphones or tablet computers), hardware or computer software. However, this does not reflect the complexity of how a technical artefact is used, specifically the need for knowledgeable people to use artefacts to make a product, and the necessary organisational methods to configure the knowledgeable people and the artefacts to make a product (Cunningham 2012).

In Cunningham (2012), Enos (1991) defines technology broadly to include four components, viz. technical hardware (machines and equipment in a specific configuration make goods or provide a service), know-how or knowledge (comprising scientific, technical and codified knowledge, and formal qualifications), organisation (specifically the managerial methods that links the ‘hardware’ and ‘know-how’ components and that integrates the other elements into a firm or organisation) and the product or process (goods or services produced). These components are depicted graphically in Figure 1 below.

**FIGURE 1. GRAPHICAL DEPICTION OF THE FOUR COMPONENTS OF TECHNOLOGY**

The knowledge-based economy

The concept of technology and the role of technological innovation need to be viewed in the context of the knowledge-based economy. The concept of a knowledge-based economy was introduced to South African in

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It would be a mistake to treat the knowledge-based economy as a new separate economy. The knowledge-based economy is a concept that is infiltrating all aspects of our lives.
the NRDS within the context of transitioning the South African economy from being reliant on natural resources towards becoming a knowledge-based economy in order to accelerate economic growth, create wealth on a sustainable basis and improve the quality of life of South Africans (DST 2002).

The effect of the increasing knowledge intensity on the economy has been discussed in Section 2 (as part of the advanced and specialised factors of production), and again as an element of technology in the above subsection. However, it is worth addressing the concept of a knowledge-based economy briefly.

The notion of the knowledge-based economy seeks to integrate knowledge into traditional (neo-classical) economics. Classical input-output economic theory was viewed as not being sufficient to explain long-term growth over and above the production factors of labour, capital, materials and energy, and the resulting outputs of the economy (OECD 1995 in Godin 2003).

This new economic growth theory recognises the knowledge base as an additional factor of production (Ibid). Knowledge-based economies are characterised by a high degree of investment in innovation (including R&D); in the production, distribution and use of new knowledge; and in the enhancement and/or acquisition and diffusion of existing knowledge, intensive use of acquired technology and a highly educated workforce (Foray & Lundvall 1996, OECD 1996, OECD 2001 and Webb 2001 in Godin 2003, pp. 11-12). This does not imply that industrialised countries no longer manufacture basic products, but that they typically do so by combining new knowledge and advanced technologies.

Some commentators are of the opinion that knowledge (human capital and structural capital) is the prime determinant of economic development (Edquist 2001 and Lundvall 1992). Therefore knowledge may conceivably be seen as a far more important resource in the modern economy than physical capital (machinery and buildings), and hence the most important process in the world today is learning (Ibid). Furthermore, if knowledge and learning are the primary determinants of economic growth and development then the best strategy for economic growth is one that strengthens the knowledge base of a country (Johnson & Lundvall 2001 and Edquist 2001). Indeed, Lundvall asserts that the success of individuals, firms and national systems is determined by the capacity to learn and adapt within a context of an accelerating rate of change (Lundvall 1996).

**Innovation**

According to the OECD, an innovation is the implementation of a new or significantly improved product (good or service) or process, a new marketing method, or a new organisational method in business practices, workplace organization or external relations (OECD 2005). Product innovation takes place when the new or improved product is introduced into the market; whereas processes innovation, marketing method innovation or organisational method innovation takes place when they are brought into actual use in the firm’s operations (Ibid). Innovation can at the lowest level be new to the firm, new to the market, or new to the world, but innovation can only take place at the firm level. An innovation can be brought about through R&D or without R&D.

**Low-tech, medium-tech and high-tech**

The United Nations Industrial Development Organisation (UNIDO) makes use of the classifications developed by Sanjaya Lall for categorising manufactured goods according to their International Standard Trade Classification (ISIC) description and code, and the OECD technology classification method (UNIDO 2013, p. 60). Table 4 below shows the classification of various goods into low-tech, medium-tech and high-tech categories.

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The OECD’s technology classification method is based on R&D intensity relative to value added and gross production statistics.

UNIDO’s high-tech product category is a combination of the OECD’s high-tech and medium- to high-tech product definitions; UNIDO’s medium-tech product category uses the OECD’s medium- to low-tech product definition; and UNIDO’s low-tech product category uses the OECD’s low-tech product definition.
TABLE 4: PRODUCT CATEGORIES AND ASSOCIATED TECHNOLOGY GROUPINGS¹⁹

<table>
<thead>
<tr>
<th>International Standard Industrial Classification (ISIC)</th>
<th>ISIC code (Revision 3)</th>
<th>Technology group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food and beverages</td>
<td>15</td>
<td>Low-tech</td>
</tr>
<tr>
<td>Tobacco products</td>
<td>16</td>
<td>Low-tech</td>
</tr>
<tr>
<td>Textiles</td>
<td>17</td>
<td>Low-tech</td>
</tr>
<tr>
<td>Wearing apparel, fur, leather products and footwear</td>
<td>18, 19</td>
<td>Low-tech</td>
</tr>
<tr>
<td>Wood products (excluding furniture)</td>
<td>20</td>
<td>Low-tech</td>
</tr>
<tr>
<td>Paper and paper products</td>
<td>21</td>
<td>Low-tech</td>
</tr>
<tr>
<td>Printing and publishing</td>
<td>22</td>
<td>Low-tech</td>
</tr>
<tr>
<td>Furniture; manufacturing, not elsewhere classified</td>
<td>36</td>
<td>Low-tech</td>
</tr>
<tr>
<td>Coke, refined petroleum products and nuclear fuel</td>
<td>23</td>
<td>Medium-tech</td>
</tr>
<tr>
<td>Rubber and plastic products</td>
<td>25</td>
<td>Medium-tech</td>
</tr>
<tr>
<td>Non-metallic mineral products</td>
<td>26</td>
<td>Medium-tech</td>
</tr>
<tr>
<td>Basic metals</td>
<td>27</td>
<td>Medium-tech</td>
</tr>
<tr>
<td>Fabricated metal products</td>
<td>28</td>
<td>Medium-tech</td>
</tr>
<tr>
<td>Chemicals and chemical products</td>
<td>24</td>
<td>High-tech</td>
</tr>
<tr>
<td>Machinery and equipment, not elsewhere classified; office, accounting and computing machinery</td>
<td>29, 30</td>
<td>High-tech</td>
</tr>
<tr>
<td>Electrical machinery and apparatus; radio, television and communication equipment</td>
<td>31, 32</td>
<td>High-tech</td>
</tr>
<tr>
<td>Medical, precision and optical instruments</td>
<td>33</td>
<td>High-tech</td>
</tr>
<tr>
<td>Motor vehicles, trailers, semi-trailers and other transport equipment</td>
<td>34, 35</td>
<td>High-tech</td>
</tr>
</tbody>
</table>

Summary

Section 4 proposes a definition for advanced manufacturing. The definition includes the elements (organisation, hardware and knowledge) and objects (products and processes) of technology, combinations of new and old knowledge and technology as additional advanced and specialised factors of production through organisational and/or business model innovation, product innovation and process innovation. It is also clear from the information presented above that the categories of low-tech, medium-tech and high-tech apply to products (and also to firms or sectors), primarily for import-export trade data purposes.

A firm that makes high-tech goods may not necessarily employ advanced manufacturing approaches. For example, an electronics firm which imports components and merely assembles them may well be classified as a high-tech firm, but due to the absence of new technologies and innovation, the production that takes place within such a firm would not be classed as advanced manufacturing.

On the other hand, firms may well make low- or medium-tech products, but their production operations may be described as advanced manufacturing. For example, a company in the food and beverages sector may make use of biotechnology platform technologies, use highly-skilled workers and undertake product, process and organisational/business model innovation, in which case this ‘low-tech’ firm does truly undertake advanced manufacturing. Another example is in the medium-tech foundry industry. A foundry using an AM platform combined with computer aided design and simulation software can make production moulds to test a new product which is subsequently cast using traditional approaches. In this instance advanced manufacturing is used to make medium-tech products.

With regard to inclusive job creation, high-tech companies that use advanced manufacturing approaches can create jobs for workers at all skills levels, not only for high-skilled university graduates. This may entail low-
skilled workers using sophisticated tools or production methods in operations. Equally, low-tech companies that use advanced manufacturing approaches can contribute not only to job preservation but also to job creation. We will illustrate the positive correlation of the use of advanced manufacturing in a low-tech sector and a high-tech firm using two examples in Section 7, specifically the use of AM in the footwear sector and high-tech composite products in the aerospace sector.

A counter-factual argument would be that if South Africa does not invest in innovation and the increased use of more advanced manufacturing approaches, the result would be a less competitive manufacturing sector leading to even more local job losses.

7. ARGUMENTS IN SUPPORT OF ADVANCED MANUFACTURING

Arguments can be made in support of advanced manufacturing as being critical for the wealth and prosperity of a country. For instance, many low-skilled workers have found work in hi-tech sectors due to the high multiplier effects of the manufacturing sector. Innovation in new products or new markets also directly creates new jobs, new career options, and more opportunities for economic diversification. Lastly, advances in manufacturing will also better use finite resources in the country, thus increasing productivity, wages and thereby wealth.

7.1 The observed effect of innovation on jobs

The fears of significant job losses as outlined in Section 5.1 have not materialised. Commentators such as Rogoff have suggested that the flexible nature of market economies has absorbed the effects of technological changes (Rogoff 2012). In WEF (2014), Shibulal states that, “Technology is often blamed for unemployment, but jobs are not disappearing. They’re evolving. Losses in one sector often mean gains in another.”

Section 5.1 examined the often unfavourable perceptions of technological advancement on jobs. Now that the concepts of technology, innovation, the knowledge-based economy, low-tech, medium-tech, high-tech and advanced manufacturing have been elaborated on in Sections 4 and 5.2, this section will examine the theoretical basis of how technological advancement could affect employment, and will also refer to empirical studies undertaken in industry, primarily in relation to the manufacturing sector.

Firstly, the issue of how technological advancement affects employment is long-running and has been the subject not only of robust public debate but also of research at a theoretical and an empirical level (Freeman & Soete 1997 in Peters 2005, p. 1). In fact, there is no consensus amongst academia regarding the effects of innovation on employment (IFC 2013, p. 19).

From a theoretical perspective there are several ways in which innovations and higher productivity can destroy existing jobs (displacement effects) or create new jobs (compensation effects). Product and process innovations also influence employment differently (Freeman & Soete 1997 in Peters 2005, p. 1 and IFC 2013, p. 19). The nett effect on employment ultimately depends on several firm-, sector- and country-specific factors, and also whether employment is measured at a firm, industry or country level (IFC 2013, p. 19).

The OECD (2013, pp. 94-96) posits a causal link between the inputs of product and process innovation and the resulting mix of job destruction (displacement effect) and job creation (compensation effect) (Figure 2). The report maintains that complex product innovation is determined primarily by formal R&D, while process innovation relates primarily to embodied technological change\(^20\) (ETC), with a combination of R&D and ETC resulting in both product and process innovation.

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\(^{20}\) The OECD states that ETC refers to innovation embodied in new equipment, and that process innovation relates to ETC “acquired by investment in new machinery and equipment and by purchasing external technology incorporated in licences, consultancies and know-how” (2013, p. 94).
Simplistically, product innovation is seen to create new jobs due to the creation of new markets, whereas process innovation leads to job losses due to fewer workers required to produce the same output using new machinery (*Ibid*). However, in reality the effects are not that simple. Product innovation may also cause job losses in the sector that produces the ‘old’ products which are displaced by the ‘new’ products. In addition, process innovation is also associated with several compensating mechanisms (see below) which may offset job losses brought about through mechanised labour savings.

In the OECD (2013, p. 95) Vivarelli (2013) describes several labour-compensating mechanisms\(^\text{22}\) of technological change as follows:

- **Through new machines.** The same process innovations that displace workers in the product industries where the new machines are introduced create new jobs in the capital industries where the new machines are produced.
- **Through decreases in prices.** Although innovations involve the displacement of workers, these innovations lead to a decrease in the unit costs of production, and in a competitive market this effect leads to decreasing prices; in turn, decreasing prices stimulate new demand for products and so additional production and employment.
- **Through new investments.** In cases where the competitive convergence is not direct, during the gap between the decrease in costs – due to technological progress – and the consequent fall in prices, extra-profits may be accumulated by innovative entrepreneurs. These profits are invested, creating new output and new jobs.
- **Through declines in wages.** Where there is demand for labour, the direct effect of job-destructive technologies may be compensated within the labour market. Assuming free competition and full substitutability between labour and capital, technological unemployment implies a decrease in wages and this should induce a reverse shift back to more labour-intensive technologies.

\(^{22}\) This bulleted list is a direct quotation from OECD (2013).
• **Through increases in incomes.** Trade unions may redistribute part of the innovation rent back to the workforce and thus a portion of the cost savings due to innovation can be translated into higher wage income and hence higher consumption. This increase in demand leads to an increase in employment, which may compensate for the initial job losses due to process innovations.

An example of the ‘decreases in price’ labour-compensating mechanism of technological change relates to the development and introduction of automotive assembly lines by Henry Ford (IFC 2013, pp. 17-19). As a radically disruptive process innovation, the assembly line rendered automotive production much less labour-intensive compared with the craftsmanship-based single unit or batch production of the day where only the affluent could afford to purchase automobiles. However, cheaper cars created a strong market demand over time and therefore substantially increased the market size. This innovation essentially laid the foundation for a global automobile industry, which led to significant direct job growth in automotive production, in supply chains and in support services.

Concerning the level at which employment effects are measured, jobs might be lost in some firms due to productivity improvements, but there may be gains at the industry or country level (IFC 2013, pp. 17-19). In IFC (2013, p. 19), Nordhaus (2005) reports that more rapid productivity growth in manufacturing led to higher rather than lower employment at the industry level, although some job losses may occur in individual companies or sub-sectors. He concluded that the displacement effects are more than offset by the compensation effects of lower prices and an improved global competitiveness of the industry. For instance, a manufacturing firm that decreases its production workforce due to efficiency improvements often in effect creates indirect jobs in packaging, transport and logistics.

A large and international manufacturing firm study found that there was higher employment growth in firms which innovate in products or processes and have achieved higher productivity compared with non-innovative firms (Dutz et al. 2011). The results support the notion that not only is innovation a strong driver of employment growth, but that innovation-driven growth is inclusive (that is, it also absorbs unskilled workers).

Another study concluded that product innovation in manufacturing firms is linked to increases in employment in a 1:1 ratio with sales growth, whether the firm adopts a ‘first product to market’ approach or a product imitation strategy (Peters 2005). However, the study also concluded that process innovations are associated with a slight employment reduction for manufacturing firms.

Several studies have also shown that product innovation is positively correlated with employment growth irrespective of the type of industry (Alvarez et al. 2011, Harrison et al. 2008, Mairesse, Zhao & Zhen 2009 and Peters 2005 all in IFC 2013, p. 19).

### 7.2 Multipliers and wages in the manufacturing sector

This section examines the multiplier effects associated with the manufacturing sector. The focus is primarily on jobs multipliers, although other economic multipliers will also be discussed. The wage rates of average and high-tech manufacturing are also discussed.

Countries that have appreciable advanced manufacturing capabilities exhibit good economic multipliers in the manufacturing sector (Deloitte 2013b, p. 29). The higher economic multipliers of the manufacturing sector compared to other sectors are attributed to substantially larger supply chains (COC 2011a and McDougle & Furr 2013b, p. 3). For instance, in the USA an additional value add of $1.40 is created in other sectors for every dollar of value created in manufacturing (*Ibid*). The next closest sectors are Information and Agriculture at approximately $1.15 additional value added.

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23 The study involved 26 000 firms across 71 countries including OECD and developing countries.

24 The study involved 2 200 German manufacturing and services firms between 1998 and 2002.

25 In this instance product innovation included the introduction of a new product to a market and also firms that pursue product imitation strategies, i.e. new to the firm but not new to the market.
In research commissioned by the MC, Abedian et al. claims that the manufacturing sector can create significant economic spillovers and is amongst the top three sectors in the country with the highest multiplier effects\(^\text{26}\) (2011, p. 5). They estimate that R1 invested in the South African manufacturing sector will create an additional value add of R1.13 (Table 5) (Abedian et al., p. 15). Furthermore they argue that the close relation between agriculture and manufacturing (especially in the agro-processing sector) will lead to strong indirect benefits as well (\textit{ibid}).

**TABLE 5: OUTPUT MULTIPLIERS OF A R1 INVESTMENT IN SELECTED SOUTH AFRICAN SECTORS\(^\text{27}\).**

<table>
<thead>
<tr>
<th>Sector</th>
<th>Multiplier (output)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>R1.79</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>R1.13</td>
</tr>
<tr>
<td>Construction</td>
<td>R0.81</td>
</tr>
<tr>
<td>Wholesale and Retail</td>
<td>R0.72</td>
</tr>
<tr>
<td>Mining</td>
<td>R0.60</td>
</tr>
<tr>
<td>Finance</td>
<td>R0.49</td>
</tr>
<tr>
<td>Transport &amp; Communication</td>
<td>R0.03</td>
</tr>
<tr>
<td>Electricity</td>
<td>R0.03</td>
</tr>
</tbody>
</table>

Abedian et al. estimates that approximately three decent and sustainable jobs will be created as a result of a R1 million additional investment in the manufacturing sector (Abedian et al. 2011, p. 15). This is in contrast with estimates of almost 11 jobs in the labour-intensive agricultural sector and 0.1 jobs in the capital-intensive transport and communication sector and the electricity sector for the same level of additional investment (\textit{ibid}). Table 6 shows the employment effects as a result of an additional R1 million investment in selected South African sectors.

**TABLE 6: NUMBER OF JOBS CREATED FOR A R1 MILLION INVESTMENT IN SELECTED SOUTH AFRICAN SECTORS\(^\text{28}\).**

<table>
<thead>
<tr>
<th>Sector</th>
<th>Multiplier (no. of jobs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>10.5</td>
</tr>
<tr>
<td>Wholesale and Retail</td>
<td>3.3</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>3.0</td>
</tr>
<tr>
<td>Construction</td>
<td>2.5</td>
</tr>
<tr>
<td>Finance</td>
<td>1.0</td>
</tr>
<tr>
<td>Mining</td>
<td>0.5</td>
</tr>
<tr>
<td>Transport &amp; Communication</td>
<td>0.1</td>
</tr>
<tr>
<td>Electricity</td>
<td>0.1</td>
</tr>
</tbody>
</table>

A country with a strong manufacturing base exhibits a high jobs multiplier effect on the supporting services sector\(^\text{29}\) (COC 2011b and Zalk 2014, p. 6). In fact it is believed that the manufacturing sector has a higher jobs multiplier than any other economic sector, and that the manufacturing sector jobs multiplier is rising primarily due to smarter and more advanced manufacturing (Bernaden pp. 3, 7).

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\(^{26}\) These are output, employment, export earnings and fiscal revenue multipliers.

\(^{27}\) Source: Abedian et al. (2011, p. 15).

\(^{28}\) Source: Abedian et al. (2011, p. 15).

\(^{29}\) These sectors include banking, logistics, education, call centres and healthcare (Deloitte 2013b, p. 29).
The reason for the rise in jobs multiplier effects in advanced manufacturing is because such manufacturing entails investments in R&D and HRD which results in the development of product and process technologies and associated increased productivity and innovation, thereby creating a similar high skills demand in sectors which support manufacturing (Bernaden p. 1 and Deloitte 2013b, p. 29).

Table 7 below shows a range of manufacturing activities and their associated multiplier effects, showing that as manufacturing becomes more sophisticated the jobs multiplier rises. It reveals that in general manufacturing, for every one direct manufacturing job created there are approximately 1.6-2.5 indirect jobs created. However, as manufacturing becomes more sophisticated, the number of indirect jobs created rises to between 4 and 15 for every one direct manufacturing job. This is largely in line with a statement by Majaja\textsuperscript{30} (in Wild 2012) that advanced manufacturing activities typically create 7 indirect jobs in associated supply chains and service industries for every direct manufacturing job.

<table>
<thead>
<tr>
<th>Type of manufacturing</th>
<th>Jobs multiplier</th>
</tr>
</thead>
<tbody>
<tr>
<td>General manufacturing\textsuperscript{32,33}</td>
<td>1.58-2.5</td>
</tr>
<tr>
<td>High-tech manufacturing\textsuperscript{34}</td>
<td>3.5</td>
</tr>
<tr>
<td>Microprocessor electronics manufacturing\textsuperscript{35}</td>
<td>4.1</td>
</tr>
<tr>
<td>Jet engines\textsuperscript{36}</td>
<td>7-8</td>
</tr>
<tr>
<td>Electronic computer manufacturing\textsuperscript{37}</td>
<td>15</td>
</tr>
</tbody>
</table>

The rider in this instance is that the above high-tech manufacturing firms need to exhibit advanced manufacturing characteristics, have strong and extensive supply chains (implying a well-established supply base) and forward linkages, and a network of sophisticated service providers which provide the necessary support. Without an advanced manufacturing approach, extensive supply chains and sophisticated service providers the indirect jobs multipliers will never be realised. For example, a high-tech electronics manufacturer that merely imports sub-components and assembles the inputs into products, and is supported by overseas service providers will not create many indirect jobs, even though the firm would be classified as a high-tech company.

In addition to the advantageous jobs multipliers of manufacturing generally and combinations of high-tech manufacturing specifically, wages in high-tech manufacturing are much higher than conventional manufacturing, which in turn are still higher than wages in sectors such as the services industry (COC 2011b, McDougle & Furr 2013a and OSTP 2011, pp. 9). A career in manufacturing historically translated into low wages for low-skilled workers, but this is no longer necessarily the case.

In the USA, manufacturing wages are approximately 22% higher than wages in services (OSTP 2011, p. 9). Additionally, workers in high-tech manufacturing industries in the USA earn 50-100% more than the average wage rates in all other fields (OSTP 2011, p. 9), and in the UK high-tech manufacturing workers earn 27% higher wages than the average of all manufacturing and approximately 47% higher wages than low-tech manufacturing (DBIS 2009, p. 4).

\textsuperscript{30} Chief Director: Advanced Manufacturing at the dti.

\textsuperscript{31} Cautionary disclaimer: “Studies highlight that multipliers are highly dependent on the regional, local and industry context. Furthermore, they vary with the maturity of the company, the distribution channel model used by a specific client as well as the cost and availability of labor.” (IFC 2013, p. 30).

\textsuperscript{32} In the USA. Source: Bernaden (p. 7).

\textsuperscript{33} In the USA. Source: Giffi (2012, p. 5).

\textsuperscript{34} Specifically regions like California. Source: DeVol et al. (2009) in Bernaden (p. 7).

\textsuperscript{35} Specifically Intel Corporation, USA. Source: Josephson (2011) in Bernaden (p. 6).

\textsuperscript{36} Specifically General Electric Aviation, USA. Source: Bernaden (p. 5).

\textsuperscript{37} Source: DeVol et al. (2009) in Bernaden (p. 7).
8. SELECTED CASE STUDIES ILLUSTRATING JOB CREATION IN ADVANCED MANUFACTURING FIRMS

In this section two different examples are provided that illustrate how advanced manufacturing may be useful to a low-tech sector, and how low-skilled people might participate in an industry that is generally labelled as being advanced or high-tech.

8.1 Applying advanced manufacturing in a low-tech sector: Footwear

The footwear sector is estimated to be the third most labour-intensive sector in South Africa, only exceeded by the clothing and furniture sectors (DTI 2012 in De Beer & Emslie 2012). Global footwear industries have restructured significantly, with a geographic shift of production towards developing countries that have lower production costs, more specifically labour costs. The most significant growth has been shown by Chinese footwear companies, and as a consequence, most developed countries have reduced local footwear manufacturing in volume terms. Globally the manufacturing of footwear for exports has quadrupled (Ibid).

Figure 3 shows that the long decline in local footwear unit production from 1988 to 2005 has only recently reversed. The South African footwear sector has not been able to take advantage of the substantial growth in the South African market over the last decade due to increased international competition (mainly from the East). Even though local production has grown since 2005, employment in the sector has been in decline since 2004. Had the industry been more competitive, production output may have grown more than it has done, and the decline in employment may have been reversed (De Beer & Emslie 2012).

The global footwear sector follows a buyer-driven value chain, resulting in growing pressure on producers concerning buyer demands for price, variety and quality. As global production shifts to lower-cost locations, cost pressures are sustained on the industry as a whole. As a result, footwear manufacturers are not able to compete on the basis of price or gross margin (the pre-eminent tool used by most retailers) as new, lower-cost locations are continuously identified (De Beer & Emslie 2012).

However, retail chains around the world are seeking alternative supply chain models, realising that the ‘price-first’ model is misleading due to hidden costs and risks as alluded to in Section 2.1: these include rising logistics and transportation costs, risks associated with long lead times and large inventory holdings due to production being far from the market, and environmental considerations. This had led to several alternative avenues through which local firms can compete, including guaranteed quality, small-batch production runs and short lead times to market (Ibid).

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38 As measured by number of jobs created per unit of capital invested.
Previous analysis indicates that the South African footwear sector is uncompetitive with regard to a lack of skills, ageing equipment, the development and application of technology and high labour costs relative to Asian competitors (Ibid). The sector is regarded as a low-tech industry that employs large numbers of low skilled workers. Many of the domestic footwear companies have old shoe designs and utilise outdated production methods.

With this in mind and to assist the industry to improve its competitiveness, the Vaal University of Technology (VUT) embarked on an applied research project. The work performed to date included demonstrating how advanced manufacturing techniques can be used for accelerated prototype development, rapid production tooling development and quick production of functional samples for prospective clients.

The VUT demonstrated to the local footwear industry that aesthetic product prototypes and repeatable samples could be delivered to buyers within 3-4 days of receiving a 2-dimensional design, compared with the current turnaround time of 12-16 weeks. This was done by combining computer aided design (CAD) skills, virtual 3-dimensional (3D) modelling and ‘growing’ aesthetic (i.e. not functional) samples and functional tooling inserts on the VUT’s AM equipment.

The VUT also assisted a footwear manufacturer to digitise one of its old designs so that the design could be modernised. This entailed digitising an original shoe using a 3D scanner. The 3D model was then restyled and improved in line with contemporary shoe trends using virtual 3D modelling software. The redesigned shoe components were grown in Nylon Polyamide using VUT’s AM equipment and then hand-sewn together with the conventional components to create a functional prototype of the newly designed shoe.

In addition to the much faster turnaround times for the development of prototypes and samples, the tooling inserts made by AM were designed to be compatible with the manufacturer’s existing factory equipment. The use of 3D scanning, modelling and AM also shows the potential for footwear manufacturers to update their old product designs and also create totally new designs using these techniques.

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Through this process the VUT showed several firms how advanced manufacturing approaches could be integrated into their current systems, tooling and manufacturing equipment for rapid product development and quick lead times to market. It shows the potential for a traditional and low-tech sector to become more competitive through the adoption of advanced manufacturing approaches, without the need to replace its existing production equipment and systems. In addition, this example illustrates how the adoption of advanced manufacturing practices need not displace traditional jobs, but how it can potentially contribute not only to job preservation but also to increasing volumes and employment opportunities.

8.2 Case Study: Creating careers for low-skilled workers in an advanced manufacturing high-tech company: Advanced composite materials

AAT Composites Pty (Ltd) is an advanced composites manufacturing company that produces high-tech components and assemblies for the aerospace and top-end automotive sectors. It has a turnover in the region of R250 million per annum and 100% of its production is exported, indicating that the company is globally competitive.

The company has an in-house Engineering Division that undertakes product design and prototyping, development of product-specific manufacturing procedures as well as tooling development. The Engineering Division also provides engineering support to the Operations Division for production.

Even though advanced composites manufacturing is classified as a high-tech sub-sector, it is also very labour-intensive, particularly with regard to semi-skilled labour. A key distinguishing feature of the advanced composites manufacturing within AAT Composites is that their production cannot be fully automated like other high-tech industries due to the diverse product mix made by the company. Companies that manufacture large structures with large curvatures such as airplane wings make use of robotics to make such components, but it is more difficult to automate the production of a diverse range of smaller components that have tight curvatures.

Out of the headcount of 425 at AAT Composites there are only 36 people who have tertiary qualifications (20 engineers, 5 technologists and 11 artisans). Excluding the top management and administrative staff of 20 people, the rest of the staff in the Engineering Division, Operations Division and Quality Division are semi-skilled workers constituting roughly 85% of the workforce.

AAT Composites recruits unskilled school-leavers from the community within close proximity to the company. These workers can progress through the ranks of the company and can choose from several career path options.

School leavers are screened for kinaesthetics/motor skills aptitude and placed on an internal formalised training programme before being deployed as operators, primarily within the Operations Division. The first level of training is to obtain basic skills in composites manufacturing specific to the above occupational job categories. Thereafter the workers receive product-specific training.

Operators within the Operations Division that show potential, initiative and aptitude are identified for career advancement and/or educational advancement. They may become Specialist Operators or move into a production line management role (Team Leader, Shift Manager or Section Manager). In terms of educational advancement, Operators may also register for an apprenticeship programme. After completing the required theoretical training and undertaking a trade test at an external college, they become in-house Artisans, and may then move on to supervisory and management positions within the company, or remain as Artisans.

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40 At an operator or equivalent level, including team leaders and supervisors.
Operations Division Operators may also move into the Engineering Division. The first step is to be promoted to a Technical Assistant, entailing work such as doing lay-ups for prototypes, configuration of operating procedures and engineering drawings. Technical Assistants who show an aptitude for 3D computer modelling may receive CAD/CAM training and be promoted to CAD/CAM Technicians which entails the implementation of product and tooling designs by Engineers and Technologists. The company is also considering a further step, wherein CAD/CAM Technicians may receive further training and become Designers who are responsible for the conceptualisation of new products and tooling.

During the period 2011-2013 there was a total of 145 Operators within the Operations Division who were promoted internally to higher positions within the production environment. Currently the Engineering Division has 3 Technical Assistants and 4 CAD/CAM Technicians who were once Operators. The majority of the CAD/CAM Technicians also have the potential to be developed into Designers.

The example of AAT Composites demonstrates that a high-tech company that makes use of advanced manufacturing approaches can also be labour-intensive. This disproves the notion that high-tech companies that adopt an advanced manufacturing approach are primarily capital-intensive, only employ highly-skilled workers and do not create low-skilled jobs. It is also important to note that this company is not only using sophisticated equipment and deep insight into composites, but that the way the company develops its internal knowledge and competency base itself is very innovative, thus the company’s production activities fit the working definition of advanced manufacturing as proposed in Section 4.

In addition, the nature of employment creation within AAT Composites is highly inclusive. School-leavers with no tertiary qualification of any kind have several career path options within the company, either via a technical route in production or engineering, or the management route within production. School-leavers also have the opportunity to obtain an apprenticeship qualification and become an artisan.

9. CONCLUSIONS

Combinations of new and old knowledge and technologies are increasingly being recognised as advanced and specialised factors of production to complement traditional factors in the manufacturing sector for high growth and the creation of decent, well-paying jobs. Evidence of this can be found in international private sector survey reports and in the global government manufacturing policy discourse which recognises talent-driven innovation (which is underpinned by multi-disciplinary skills and results in knowledge production) and advanced technologies as the most important drivers of manufacturing competitiveness.

Despite advanced manufacturing being recognised globally as important to reverse de-industrialisation and to create decent, well-paying jobs, lingering perceptions regarding the negative correlation of advanced manufacturing and technological advancement on employment have created resistance to the adoption of advanced manufacturing practices by industry. These perceptions are particularly evident in South Africa against the backdrop of declining employment and a reducing manufacturing growth rate as a proportion of national growth, where adversarial management-worker labour relations are contributing to current and projected job reductions through mechanisation. However, it should also not be assumed that organised labour will resist the introduction of advanced manufacturing approaches, particularly in light of advantageous multiplier effects.

The effects of advanced manufacturing, technological advancement and innovation on employment are far from simple and causal. From a theoretical perspective there is no consensus in academia on the effects on employment, with multiple factors contributing to job creation and job destruction in relation to different types of innovation. The effect on jobs varies depending on whether one examines the effects on jobs at a

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41 Computer aided design and computer aided manufacturing.
firm, industry or sector level. Results also seem to vary depending on the industry or services sector selected. It can be concluded that perceptions of advanced manufacturing, innovation and technological advancement are negatively influenced by the inconsistent use of terminology, conflation of concepts and incorrect use of terms.

However, there is empirical evidence of a strong and positive correlation between product innovation and job creation in the manufacturing sector, although there seems to be a slightly negative correlation between process innovation and jobs. In addition, the proportion of indirect jobs to direct manufacturing jobs increases dramatically as manufacturing becomes more high-tech and advanced due to the extensive forward and backward (extensive supply chains) linkages and a sophisticated manufacturing services sector.

Several entrenched notions regarding advanced manufacturing and jobs using actual examples have been dispelled. In the local low-tech and traditional footwear sector there is evidence that the adoption of advanced manufacturing practices would improve the industry’s competitiveness through much faster product development compared with traditional methods, and that the use of advanced manufacturing methods in conjunction with existing production equipment would potentially lead not only to job preservation but also job growth.

In the instance of an advanced composites manufacturing company it is explained how a high-tech company is not only very labour-intensive, but that employment in the company is truly inclusive with most of the workforce being semi-skilled. The company hires unskilled school-leavers and offers various career path options to Operator-level workers to advance via promotion to senior levels and/or advance through obtaining a tertiary qualification. This disproves the myth that high-tech and advanced manufacturing companies only employ highly-skilled workers and not low-skilled workers.

The working definition of advanced manufacturing as explained earlier in this chapter incorporates advanced and specialised factors of production, namely new knowledge and advanced technologies, which are of utmost importance for economic competitiveness, economic growth and job creation. It also incorporates all forms of innovation as well as the imperatives of appropriate multi-skills development for talent-driven innovation and knowledge production. It should also be noted that advanced manufacturing is not an economic sub-sector. It is an approach that must be fostered across the entire manufacturing sector, irrespective of firm size or sub-sector.

10. POLICY IMPLICATIONS

Pouris (2012) reports that knowledge-intensive services industries and high-tech manufacturing industries have grown faster than other segments of the economy. He notes that their combined contribution to global economic output was approximately $18.2 trillion in 2010, representing approximately 30% of world GDP (Ibid). As a result, governments are recognising that funding the development of complex and emerging technologies to support these industries through innovative products and services will not only result in high-value output and improved competitiveness but also generate well-paying jobs (Giffi 2012, pp. 12, 24, OECD 2013, p. 6, OSTP 2011, p. ii and Pouris 2012).

Future value is seen to accrue through wholly unanticipated breakthroughs, but also via existing or emerging technologies, all of which will transform manufacturing as we know it (GOS 2013, pp. 20-21). For example, AM and other technologies such as new materials, computer-controlled tools, biotechnology and green chemistry together with direct customer input into product design will allow for cost-effective, fast and personalised production, which in turn will disrupt conventional manufacturing productions and supply chains (Ibid).
The EU has a focus on multidisciplinary and cross-cutting KETs\textsuperscript{42} for a wide range of product (goods and services) and process innovations.\textsuperscript{43} It defines KETs as “knowledge-intensive and associated with high R&D intensity, rapid innovation cycles, high capital expenditure and highly skilled employment” (EC 2012, pp. 2-3). Interestingly, studies have reportedly shown that public investments in KETs can produce returns four-fold that of the initial investment in the form of taxes and social security contributions, and that the application of KETs contributes significantly to job creation (EC 2010 in EC 2012, p. 3). The UK has a similar approach, but has a broader focus with technologies for manufacturing categorised into pervasive and secondary technologies.\textsuperscript{44}

South Africa needs to embrace and adopt advanced manufacturing approaches alongside conventional manufacturing methods for economic growth, employment and international competitiveness. Talent-driven innovation and advanced technologies need to become more important from the perspective of South African manufacturing stakeholders. The advanced manufacturing of today will become the conventional manufacturing of tomorrow, and so the South African manufacturing sector needs to rapidly embrace and adopt advanced manufacturing approaches in order to improve competitiveness and prevent further job losses and de-industrialisation.

With regard to public sector policy implications, the state should support innovation and the creation of advanced and specialised factors of production in a coordinated and streamlined fashion. Specifically, the state needs to invest in appropriate multi-disciplinary skills development across the board for the manufacturing sector, from encouraging and supporting workplace training, to learnership and apprenticeship programmes, technician training, and all the way to postgraduate studies and post-doctoral fellowships. Doing so will serve to increase the knowledge base of the country and improve South Africa’s capacity for talent-driven innovation which, alongside advanced technologies, is seen by eminent economists and innovation policy practitioners as the most important determinants of economic success.

Public sector funding should be dedicated to the development of new and advanced technologies, including platform technologies for the manufacturing sector, as the private sector will initially tend to under-invest in technology development. These technologies should be developed in a prioritised fashion with due consideration given to existing public sector research and development capabilities, market needs and other ‘top-down’ considerations such as localisation and public sector procurement. Public sector investment in platform technologies must create positive externalities and spill-overs. Due regard also needs to be given to international technology trends and drivers.

A critical question is how the State can increase the absorptive capacity of the private sector to adapt and integrate advanced manufacturing technologies into their enterprises, taking advantage of pre-existing ‘hidden’ technology platforms already in place within public-funded institutions like science councils and higher education institutions.

The state needs to take stock of existing policy levers and implementation actors across departments in order to map the manufacturing-related instruments and institutions to identify gaps and opportunities for growth, jobs and enterprise creation. Opportunities need to be identified where the introduction of advanced manufacturing approaches has the greatest potential for preservation and creation of direct jobs together with high indirect job multipliers.

\textsuperscript{42} The EU’s KETs are micro-/nanoelectronics, nanotechnology, photonics, advanced materials, industrial biotechnology and advanced manufacturing technologies (recognised as a ‘cross-cutting’ KET) (EC 2012, p. 3).

\textsuperscript{43} The main sectors where KETs find application include the automotive, food, chemicals, electronics, textiles, energy, environment, pharmaceuticals, construction, aerospace and telecommunication sectors (EC 2010 in EC 2012, p. 3).

\textsuperscript{44} Pervasive technologies: ICT, sensors, advanced and functional materials, biotechnology and sustainable/green technologies. Secondary technologies: Big data and knowledge-based automation, the Internet of things, advanced and autonomous robotics, additive manufacturing (also known as 3D printing), cloud computing and the mobile internet. Source: GOS (2013, p. 21).
The indirect jobs multiplier potential associated with advanced manufacturing will only be realised if local supply chains and service providers are developed and strengthened. This has implications for supply chain development programmes, particularly in respect of South Africa’s public procurement and technology localisation programmes, and the designation of local content levels.

New science and technology, industrial and education policy instruments may need to be designed and created and existing instruments reviewed and re-focused if necessary. The existing and new instruments would certainly need to be supported through substantial fiscal allocations over and above the Medium Term Expenditure Framework allocation. While it would be advantageous for additional resources to be allocated to implementing such an approach, simply re-focusing existing efforts in a co-ordinated manner would make for a good start.

The US government announced a $1 billion Advanced Manufacturing Partnership (AMP) programme in July 2012 which proposed the creation of 15 innovation institutes covering a range of advanced manufacturing technologies to revitalise manufacturing in the USA (White House 2012a). The AMP seeks to bring industry, universities and government together to co-invest in emerging technologies and skills to support a vibrant domestic advanced manufacturing sector that would create high quality jobs.

The pilot phase of this initiative is a public-private institute for manufacturing innovation which entails a $30 million investment by the USA government over 3 years, with industry co-funding of $40 million (White House 2012b). The National Additive Manufacturing Innovation Institute (NAMII) was selected through a competitive process, and the winning consortium included manufacturing firms, universities, community colleges and non-profit organizations.

With regard to the private sector, manufacturers need to continuously search for and exploit opportunities based on combinations of new and old knowledge and technologies. This applies not only to product and process innovation, but especially to organisational and/or business model innovation. This is particularly important when introducing new knowledge in the form of skilled workers and sophisticated new equipment to traditional and/or distressed industries where the barriers to the adoption of change (which are needed for success or even survival) are high.

Investment in new technologies is prone to market failures related to coordination costs. When a new technology emerges, or a new competency is needed, firms typically find it costly to coordinate multiple investments which depend on investments by other economic actors. This is exacerbated by an uncoordinated public sector which at times has policy instruments with competing priorities. The state needs to work closely with the private sector to address coordination issues.

South Africa has an excellent platform for a new approach to manufacturing. The country has an established manufacturing base and good public-funded science and technology capabilities. What is required is for the public sector, the private sector and labour to work together for the manufacturing sector to become more competitive and thereby grow and create more jobs.

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MARKUPS IN SOUTH AFRICAN MANUFACTURING
Are they high and what can they tell us?

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Abstract
The paper interrogates recent academic work that argues that markups and hence rents in South African manufacturing sectors are high, and that there is an unambiguous negative relationship between markups and productivity growth. The extent to which these claims bear up to scrutiny is important because they have found expression in both national policy documents and policy prescriptions of international financial institutions (IFI’s). This in turn has led to policy prescriptions that urge further product market liberalisation. The paper demonstrates considerable methodological and data problems with the academic research that underpins claims of high manufacturing margins and its posited unidirectional relationship with productivity growth. The paper presents data that suggests that markups and hence rents in South African manufacturing are very modest in comparison with very large markups in a range of non-tradable sectors, and argues that a far more sophisticated approach to the relationship between markups, rents and growth is required.
1. INTRODUCTION

This paper critically reviews recent contributions that aim to estimate the magnitude and impact of manufacturing markups in the South African economy, with a particular focus on an influential article by Aghion, Braun and Fedderke (2008) (henceforth ABF). ABF makes three major claims about markups or price-cost margins (PCMs) in South Africa manufacturing. First, they claim that South African manufacturing PCMs have been – between the mid-1970s and the mid-2000s – higher than in the rest of the world (C1). Second, it is claimed that South African manufacturing PCMs have been ‘non-reducing’ over this period (C2). Third, ABF claim that there is a large negative correlation between higher PCMs and manufacturing productivity growth, and that higher PCMs cause lower manufacturing productivity growth (C3). The influence of these claims has spread beyond the academic literature. The ABF paper has been cited in South African policy documents and in documents intended to influence policy, including those produced by international finance and multilateral institutions.

This paper critically assesses the three core claims set out above and examines the extent to which the approach followed by ABF adds to an understanding of manufacturing growth. Section two begins by locating ABF’s paper in relation to debates about South African industrialisation. It then briefly outlines the ABF approach to estimating PCMs and to analysing the relationship between manufacturing PCMs and productivity growth.

Section Three deals in some detail with claims that South African manufacturing PCMs are high by international comparison (C1) and ‘non-reducing’ (C2). ABF’s measure of PCMs using the same cross-country sectoral dataset that they used is replicated. South African aggregate manufacturing PCMs have since 1993 been consistently lower than developing and transition economy averages and have generally been lower than advanced economy averages. Serious methodological problems in ABF’s use of cross-country data on listed firms are identified. ABF’s key measure of PCMs using a South Africa sectoral dataset are replicated. Aggregate manufacturing PCMs are lower than in most other broad sectors of the economy since 1993 while PCMs have declined dramatically since 2004. There are also wide variations amongst manufacturing sectors. Trends in sectoral profitability – as measured by the net operating surplus – are found to be consistent with own estimates of sectoral trends. This indicates that – on its own terms – the application of the ABF method to three datasets cannot sustain the core claim C1: that South African PCMs have been higher than the rest of the world. In relation to core claim C2: that manufacturing PCMs have been ‘non-reducing’, the results show that aggregate manufacturing PCMs have been the lowest of all sectors since 1993 – apart from gold mining – and have declined dramatically since 2004. With access to ABF data it would be possible to understand the reasons for the discrepancies between the various results. However, repeated requests for access to the data went unanswered.

Section four deals with ABF’s attempts to establish a causal link between PCMs and manufacturing productivity growth and their claim C3: that there is a large and negative relationship between PCMs and manufacturing productivity growth. It is observed that their regressions suffer from significant problems. Most important is their inability to adequately control – using instrumental variables – for spurious correlation arising from potential endogeneity. In other words they are unable to reject the possibility that the relationship between PCMs and manufacturing productivity growth may run in the opposite direction: from higher PCMs to higher productivity growth.

Section Five briefly considers the policy conclusions arising from ABF’s claims. It discusses a broader and richer literature which is more useful in shedding light on the evolution of South African industrialisation and leads to very different policy implications. It sketches ways in which research on the relationship between dynamic competitive processes and South African industrialisation could more usefully develop.

Section Six concludes that ABF’s three core claims are questionable. PCM estimations in isolation are likely to add little value to an understanding of the relationship between dynamic competitive processes and South African industrialisation. There is a broader and richer literature which provides a more satisfactory basis for future research in this area.
2. LOCATING THE ESTIMATION AND INTERPRETATION OF MANUFACTURING MARKUPS IN SOUTH AFRICA’S INDUSTRIALISATION DEBATE

The evolution of corporate structure and conduct and its impact on South African economic performance is an important area of enquiry and was an important part of the debate leading up to South Africa’s democratic transition in 1994. This debate was characterised by sharply differing views on the role of corporate structure and conduct in explaining the industrial stagnation of the late apartheid period – from the mid-1970s through to democracy in 1994. Differing views on the causes of stagnation necessarily gave rise to differing policy prescriptions. Notwithstanding these differences there was a broad consensus in the literature that the late-apartheid economy was dominated by a handful of very large and interlinked conglomerates with extensive holdings across most sectors of the economy, including much of manufacturing. Similarly, there was a broad consensus that a key weakness of the apartheid-era South African economy was its failure to develop a more dynamic and diversified manufacturing export base (Feinstein 2005, Fine and Rustomjee 1996, Hirsch 2005, Joffe et al. 1995, McCarthy 1999).

The slowdown and ultimate stagnation of apartheid-era manufacturing since the mid-1970s has been widely characterised as a failed import substituting industrialisation (ISI) strategy (Feinstein 2005, Hirsch 2005, Joffe et al. 1995, McCarthy 1999) in which South Africa had exhausted import replacement opportunities in relatively ‘easy’ ISI sectors of light manufacturing, but had fallen at the hurdle of ‘hard’ ISI sectors, such as capital goods. Amongst these researchers product and factor market distortions featured prominently – albeit not with equal weight – as a major cause of the ‘failure of ISI’.

ABF’s analysis of South African manufacturing PCMs sits firmly within a neoclassical ‘market distortions’ framework. Within this framework economic rents – generated by pricing power in particular – lead to allocative inefficiencies which are detrimental to economic growth, with some limited exceptions. Policy implications of this body of work tend to emphasize further liberalization of trade, capital and labour markets.

Contrasting sharply with the ‘market distortion’ premise are Fine and Rustomjee (Fine and Rustomjee 1996) and others (Freund 2010, Mohamed and Roberts 2008) who view the modern South African economy as having emerged around a Mineral-Energy-Complex (MEC) both as a set of core sectors as well as an evolving system of capital accumulation. Much of South African manufacturing is closely linked to the mining and energy sectors, engaged in the capital-intensive processing of minerals into semi-processed intermediate inputs. As a system of accumulation the MEC involved a process of post-war conflict, compromise and ultimately increasing ‘inter-penetration’ of English and Afrikaner conglomerate capital structure. In this process the black majority of the population was excluded from any meaningful opportunities for capital accumulation (Innes, 2007). It is argued that post-apartheid economic restructuring has been heavily influenced by the evolution of the MEC in the context of the rapid ascendance of the financial sector, both globally and domestically (Ashman and Fine 2013; Mohamed and Roberts 2008). Investments by large private conglomerates and large state-owned enterprises (often in the form of joint ventures) played the predominant role in shaping industrial structure. Scale-intensive resource processing industries rapidly scaled the technological learning curve but lighter industries and capital goods did not. Tariff policy played a secondary role and was deployed more or less on demand to protect smaller scale industries in the absence of any coherent overarching industrial strategy for their development. Broadly, Fine and Rustomjee contends that the structure of MEC-based conglomerates represented both a problem and an opportunity to restructure the South African economy upon attainment of democracy. These conglomerates needed to be re-oriented to serve domestic basic needs and export markets, building on the resources, capabilities and economies of scale and scope that had been – however imperfectly and problematically – developed under apartheid. These of course were not the only views. For instance Bell (1995) argues that opportunities for
import replacement had not been exhausted and that there remained significant scope to pursue an import replacement strategy.

To a large degree the ‘market distortions’ views found expression in post-apartheid economic policy. It was believed that the removal of product and factor market distortions would allocate capital more efficiently, and raise the level of investment and employment (Department of Finance 1996). Wide-ranging trade and capital account liberalization was effected and competition policy was revamped. It was anticipated that these reforms would raise investment levels inter alia by opening up industrial sectors to greater foreign direct investment as well as to increasing small and medium enterprise participation.

Over the past decade, there has been several attempts to estimate the magnitude of South African manufacturing markups or price-cost margins (henceforth PCMs) and to establish a relationship between PCMs and broader measures of economic performance, such as productivity growth (Philippe Aghion et al. 2008, Edwards and van de Winkel 2005, Johannes Fedderke et al. 2007, J. W. Fedderke 2013, Gilbert and Du Plessis 2013). These have drawn on theoretical developments in measuring pricing power pioneered in relation to advanced economies (Hall 1988, Martins and Scarpetta 1999, Roeger 1995).

The focus is on the ABF paper, primarily because the paper has exerted considerable influence in South African policy circles. It originates from a working paper produced as part of the output of an International Panel on Growth commissioned by South Africa’s National Treasury (Aghion et al. 2006, Hausmann 2008). It has been widely cited in South African policy documents and in documents intended to influence policy including those produced by international finance and multilateral institutions (International Monetary Fund 2011, Klein 2011).

ABF adopts two techniques to estimate PCMs. The first – and more recent – “Roeger” technique estimates PCMs through a neoclassical growth model aimed at separating out the discrete contribution of imperfect competition embodied in the equation’s residual (Hall 1988). This Solow Residual, or sum of what is unexplained about growth, is traditionally attributed to all manner of ‘technological change’, often in the form of total factor productivity (TFP): the portion of growth not attributable to capital and labour in the model (Solow 1956). As Solow makes absolutely clear, this model is predicated on assumptions that include perfect competition and full employment.

Roeger (1995) refined Hall’s technique to bypass an inherent endogeneity problem: namely that markups are themselves likely to be correlated with the error term of the equation. The underlying intuition (or assumption) is that the difference between quantity (primal) and price-based (dual) measures of the SR are a reflection of the level of imperfect competition that is the extent to which prices exceed marginal cost or the PCM. The difference between the two – the Nominal Solow Residual (NSR) – cancels out the error term and thus side-steps the endogeneity problem.

The second technique is one or other variant of a proxy of the Lerner Index intended to represent the degree of monopoly power of an industry (Lerner 1934). While estimates based on the Roeger method feature strongly in ABF’s representation of the level of pricing power, it is in fact proxies of the Lerner index which enter into the ABF regressions which seek to explain manufacturing productivity growth as a function of markups. The proxies adopted by ABF estimate the gap between price and average rather than marginal cost and do not include intermediate inputs. The derivation of the NSR and its relation to the PCM is set out in some detail in Martins and Scarpetta (1999) and Edwards and van der Winkel (2005). The relevant equations are set out in Appendix A of this paper. All estimates of PCMs are extremely sensitive to key underlying assumptions. Martins and Scarpetta highlight that PCM estimates will be biased upwards if intermediate inputs are not taken into consideration (1999, p. 7). Intermediate inputs – costs which are necessarily incurred in any real-world production environment – are not included in ABF’s estimation. They also indicate that “there is no good measure of the rental rate of capital” and propose a method to arrive at what they consider a reasonable estimation of this rate (1999, p. 7 and 15).
ABF draws on three datasets to produce estimates of PCMs and related measures of markups and profitability: a UNIDO International Industry Statistics Indstat2 (henceforth Indstat2) country and sector data set, a Worldscope country and firm database of listed companies and a TIPS/SASID (Trade and Industrial Policy Strategies / South African Standardised Industry Database (SASID) which is a South Africa-specific sector dataset. They seek to account for manufacturing productivity growth taking PCMs as the major explanatory variable and using two alternative measures of productivity: value added per worker and total factor productivity (TFP). Various instrumental variables are introduced to attempt to deal with the potential endogeneity problems, specifically that the PCM is itself likely to be correlated with the error term of the regression.

ABF makes three major claims in relation to markups or price-cost margins (PCMs) in South African manufacturing. First, that margins in South African manufacturing – between the mid-1970s and the mid-2000s – have been higher than the rest of the world (C1). Second, that South African PCMs have been ‘non-reducing’ over this period (C2). Third, that there is an unambiguous and large negative correlation between higher PCMs and manufacturing productivity growth (C3).

3. SOUTH AFRICAN AND INTERNATIONAL MANUFACTURING MARKUPS

SA and international PCMs using the UNIDO Indstat dataset

The UNIDO Indstat2 dataset comprises series that include value-added, output and wages for aggregate manufacturing and 22 manufacturing sectors classified according to International Standard Industrial Classification (ISIC) codes and covering over 100 countries since 1963. It covers the period up to 2010. Citing the lack of reliable capital stock data in Indstat2, ABF does not estimate PCMs based on the Roeger methodology. They compute a proxy of the Lerner index using equation (A4) below which is an estimate of divergence between price and average rather than marginal cost. As shown in Figure 1 below, ABF presents five-year averages of South African manufacturing PCMs side by side with labour productivity growth measured by value added per worker. They argue that Figure 1 represents evidence of “a falling level of competitive pressure” over 1976-2000 (2008, p. 752) with the associated inference of a causal relationship with slowing labour productivity growth over the same period.

Remarkably, however, ABF makes no direct mention or comparison of South African manufacturing PCMs – computed using equation (A4) – with the PCMs of other countries. They provide no comparison of South African PCMs with the world mean or median values or indeed the PCM value for any other country or group of countries. This is all the more extraordinary given that their paper is littered with claims that all three datasets demonstrate that South African markups are higher than elsewhere in the world.

“Markups are significantly higher in South African manufacturing than they are in corresponding industries worldwide … Our results are robust to three different data sources, two alternative measures of productivity growth, and three distinct measures of the markup” (2008, p. 741).

“Consistently over the three datasets, markups are significantly higher in South African industries than they are in corresponding industries worldwide” (2008, p. 742).

There is consistent evidence of pricing power in South African industry that is greater than international comparators, and which is non-declining over time. Results prove to be robust across three distinct datasets, covering both industry-level data as well as firm-level evidence, two alternative measures of pricing power, alternative measures of firm profitability, and hence for alternative levels of aggregation (2008, p. 746).
“Consistently across the three datasets, we found that: (i) markups remain significantly higher in South African industries than in corresponding industries worldwide…” (2008, p. 764).

“The only reference to a world average we can detect is indirect: in presenting the ratio of listed firm PCMs to “all firm” PCMs which obscures the underlying world average computed” (Philippe Aghion et al., 2008, pp. 744–5).

**FIGURE 1:** ABF PRICE–COST MARGIN LEVELS AND LABOUR PRODUCTIVITY GROWTH FOR SOUTH AFRICAN MANUFACTURING, ROLLING HALF-DECADE SUB-PERIODS: 1976–2000

In order to calculate and compare PCMs and draw meaningful and robust conclusions across multiple countries and sectors, considerations of data quality and integrity are paramount. ABF does raise some specific concerns in relation to data reliability and availability. For instance they raise concerns in relation to:

- Non-availability and quality of capital stock data in the UNIDO and Worldscope datasets (747)
- The quality of the TIPS data since 1996 based on an assumption that the 2001 large sample manufacturing survey was not incorporated into its sectoral disaggregation and that this is the cause of consequent large standard deviations in the Solow Residual (750)
- Unspecified concerns about outliers and truncation of the Worldscope firm level data (748, 752)
- A timing mismatch between variables used for their instrumentation strategy in relation to estimating the relationship between PCMs and productivity growth (749).

However, they neglect far more fundamental problems with the Indstat2 dataset. Values for manufacturing variables are missing for South Africa and many other countries for a number of years. Observations are missing both at the level of aggregate manufacturing and to a greater extent at the level of specific two digit ISIC sectors. The problem is particularly acute for the 1990s which is a critical period for any assessment of PCMs. This era was characterized by fundamental changes in economic policy and industrial structure, including extensive trade and capital account liberalization and far-reaching corporate restructuring. There are a number of years during the 1990’s for which the data required to calculate PCMs is either missing or registers implausibly large swings and cannot be considered accurate, as is evident in Figure 2 below. This
is because missing data makes it impossible to calculate PCMs for aggregate manufacturing for 1992, 1994, 1995 and 1997. The 1998 PCM displays an implausibly large increase which on closer examination is driven by a massive and clearly erroneous ‘collapse’ of manufacturing output in the UNIDO data which is not reflected in corresponding StatsSA data. This casts doubt on the meaning of the five-year averages presented by the ABF for the critical 1991-1995 and 1996-2000 periods.

To establish what can be gleaned from the Indstat2 dataset the ABF’s proxy of the Lerner index as set out in equation (A4) is replicated across all countries and years for which this is possible. Given the extensive data problems already discussed – missing and unreliable data at the aggregate manufacturing level which is even more pronounced at the sub-sectoral level –this exercise is limited to aggregate manufacturing. Before dealing with the results of this exercise, more detail is provided on how the Indstat2 dataset is compiled.

Industat2 is compiled in the first instance from data provided by national statistical authorities (NSAs). In the South African case this is Statistics South Africa (StatsSA). UNIDO state that they do not make changes to the data supplied by NSAs except to aggregate total manufacturing values from sectoral values and to convert sector data into the ISIC classification where necessary. Missing data is hence a function of non-reporting by NSAs and it is clear that StatsSA has not consistently provided data to UNIDO over the years. Communication with StatsSA also highlights the significant change in their data collection methodology from 1993 onwards as they made efforts to conform to the international System of National Accounts (SNA) (Statistics South Africa 1999). StatsSA therefore cautions on the direct comparability of data prior to 1993 with data thereafter. Therefore the focus in this paper is on the period from 1993 onwards.

Figure 2 below shows annual South African PCMs in relation to mean and median averages for Advanced and Developing/Transition country groupings between 1963 and 2010, for all the years for which data is available. In addition to illustrating the volatility of the data, Indstat2 clearly shows that South African PCMs have been below Developing/Transition economy averages since 1993 and, in general, have also been below Advanced economy averages.

**FIGURE 2: PRICE-COST MARGIN ESTIMATES FOR SOUTH AFRICAN MANUFACTURING, ADVANCED AND DEVELOPING / TRANSITION ECONOMIES, 1963-2010**

Sources: UNIDO, Statistics South Africa  Note: Value for South Africa for 1998 is 0.46 and has been truncated
Thus using the same dataset and methodology as ABF, these results do not support their core claim C1: that mark-ups are significantly higher in South African manufacturing than worldwide. Access to ABF’s data may have shed light on the reasons why their findings differ so markedly from the findings in this paper.

SA and international PCMs – Worldscope dataset

Since ABF did not respond to requests for access to their data the authors were unable to directly interrogate the Worldscope dataset of listed companies. However, some fundamental methodological problems in relation to their findings when using this dataset are highlighted.

ABF effectively uses two sets of measures to represent markups in relation to the Worldscope dataset. The first is a calculation of the PCM based on equation (4). The difference between the average PCM computed for South African listed firms: 0.12 is nominally larger than that arrived at for an average of 56 countries: 0.11 (2008, p. 758). However, ABF gives far greater prominence to selected financial ratios in their exposition and in presenting cross-country comparisons in graphical format, as reproduced in Figure 3 below. Relying on Net Income/Sales as their primary financial ratio they state that South African listed firms “exhibit 50 percent higher profitability when this is measured with Net Income: Sales, Net Income: Assets, and Net Income: Equity ratios” (2008, p. 752). These ratios feature in graph form while subordinated to a footnote is the statement that “we note that the Gross-Margins, Market:Book Ratios, and Price:Earnings Ratios of South African firms are lower than their international counterparts” (2008, p. 752). In a subsequent contribution Fedderke (2013) highlights the return on assets of listed firms (the net income to asset ratio), arguing that this represents evidence that South African markups are more than double the world average.

![FIGURE 3: ABF’S FIRM PROFITABILITY OVER TIME: SOUTH AFRICA AND AVERAGE OF 60 COUNTRIES, WORLDSCOPE DATABASE, 1980–2004](source: Philippe Aghion et al., 2008, fig. 4)
ABF contends that they find no significant differences in profitability between ‘large’ and ‘small’ listed firms although they provide no definition of firm size or the threshold that separates large from small. Listed firms differ in obvious ways from their unlisted counterparts. They are likely to be larger and a priori one would expect them to command greater market power on average than unlisted firms. There is therefore a problem with the implicit assumption adopted by ABF that trends in the PCMs and profitability of listed firms are representative of the broader population of predominantly unlisted manufacturing firms. This problem re-emerges in Fedderke (2013). Fedderke estimates PCMs of Chinese and Indian firms from firm level databases. However, the Indian dataset is of listed firms while the Chinese dataset is of a broader sample of manufacturing firms. A great deal of caution should therefore be exercised before drawing conclusions from the comparison of results arising from these two datasets. Furthermore, and as Fedderke concedes, the extensive role of the State and presence of State Owned Enterprises in China plays a substantial role in reducing cost structures in manufacturing, particularly in relation to intermediate inputs delivered to the Chinese manufacturing sector.

There is a major methodological problem in defining the subset of listed firms and of the activities of these firms that should be included as part of the manufacturing sector. For instance, if firms are classified as manufacturing because they form part of one or more of a stock exchange’s major indices such as “Industrials”, “Consumer Goods” and “Health Care” this would result – in the South African case – in the inclusion of many firms that either are not manufacturers or for which manufacturing only constitutes a small part of turnover and profit. For instance, there are a number of listed firms within the Johannesburg Stock Exchange (JSE) Industrials index whose profit is driven entirely or predominantly by importation and distribution of industrial products. Although the authors did not have access to the list of firms ABF includes, the number of South African listed firms in their sample – between 92 and 96 – in their regression testing the relationship between PCMs and growth (2008, p. 757) is much greater than the number of listed firms that are (or have been, in the case of delisted firms) solely or predominantly manufacturers (see Appendix B). Many listed South African firms have operations outside of South Africa, requiring the separation of domestic estimations of margins and profitability from listed operations. Furthermore, over recent years there has been a widespread increase in the acquisition by non-financial corporations (NFCs) of various forms of financial assets (Crotty 2006), which also need to be stripped out before it is possible to make a meaningful assessment of the margins and profitability of domestic listed manufacturing operations. Robust cross-country comparison would require a dataset corrected for these factors – not just for South Africa but for all countries in the dataset.

As pointed out by Gilbert and Du Plessis (2013), comparisons of the financial metrics of listed companies are subject to survivorship bias. Survivorship bias arises when a sample is drawn only from firms that are currently listed and does not include firms that were previously listed but have fallen off the index due to events such as bankruptcy, de-listing or merger. Correcting for survivorship bias, Gilbert and Du Plessis contest ABF’s finding that the profitability of South African listed firms are higher than those in the rest of world, using the USA as a proxy. In Fedderke (2013) there is neither a recognition of Gilbert and Du Plessis’ critique nor correction for survivorship bias. However, Gilbert and Du Plessis also neglect the firm and activity classification problem. They do not distinguish between manufacturing and non-manufacturing firms in their comparison or correct for other distorting factors including manufacturing versus non-manufacturing operations, domestic versus international and financial versus non-financial activities. Gilbert and Du Plessis list 98 “South African Industrial Firms” (reproduced in Appendix B) which includes many that are clearly not manufacturers such as firms engaged primarily in importing; logistics and distribution; information technology; telecommunications; retail; construction; television; and media.

An assessment of margins, profitability and economic performance of listed firms should take account of the specific structural features of the South African economy. As discussed below, South Africa’s post-apartheid political settlement ushered in a series of changes to economic policy that have resulted in widespread economic restructuring. It would be difficult to interpret cross-country comparisons and time-series
of listed firm data without understanding this context of restructuring and correcting the data for misclassification of sectors and economic activities.

**Use of South African data: the South African Standardised Industry Database**

In addition to the cross-country dataset discussed above, ABF uses a South Africa-specific SASID dataset to estimate markups, using both the Roeger methodology as in equation (A1) and a proxy of the Lerner index as in equation (A5). ABF makes extensive use of a Pooled Mean Group Estimation (PMGE) technique for deriving period averages of PCMs, on the grounds of “controlling for both industry effects and dynamic adjustment to equilibrium over time” (2008, p. 750). This involves an assumption that all South African manufacturing sector PCMs display a homogenous long run mark-up across all sectors with only short term variations around this trend between 1970 and 2004. This seems a particularly inappropriate assumption given the extensive restructuring of the South African economy over such a long period that has included major structural economic and political breaks.

Figure 4 below shows the ABF estimate of a 54% aggregate average manufacturing PCM for the entire 1971–2004 period and “rolling decade” or overlapping 10-year averages, derived from the Roeger method. Based on these estimates, ABF argues that there is “no robust evidence of a declining trend in the level of the mark-up … for South African manufacturing” and that for “individual three-digit manufacturing sectors the evidence is again of consistently significant mark-ups” (2008, p. 750) as presented in an appendix.

It is important to note that the Roeger method is very sensitive to underlying assumptions such as the treatment of intermediate inputs and returns to scale. Exclusion of intermediates and the assumption of constant returns in the production function both lead to increases in PCM estimates (Martins and Scarpetta 1999, p. 7). ABF does not include intermediate inputs in their estimation. In previous papers both Edwards and van der Winkel (2005) and Fedderke (2007) find that inclusion of intermediate inputs result in a dramatic reduction in their estimates of PCMs.

**FIGURE 4:** ABF’S ESTIMATED AVERAGE MARK-UP FOR SOUTH AFRICAN MANUFACTURING, ROLLING DECADE SUB-PERIODS

Source: Philippe Aghion et al., 2008, fig. 1
However, it is the proxy of the Lerner index derived from computation of equation (A5) and not the “Roeger” results which are used in ABF’s regression of the relationship between productivity and markups. They compute the Lerner index proxy using equation (A5) as “a consistency check of our results, given the potential for high volatility in the SR [Solow Residual]” of their Roeger-based results. ABF raises concerns about the volatility of the SR in their estimations from 1996 onwards using the Roeger method and attribute this to data quality problems, particularly that variables may have been derived using a dated input–output table.

Unlike the Roeger-based estimates of PCMs they do not present the Lerner proxy results explicitly but state that they are “[c]onsistent with the remainder of the results reported thus far” and in a footnote that “[f]ull results [are] available from the authors upon request”.

Using the SASID dataset ABF’s alternate measure of the Lerner index using equation (A5) from 1970 through to 2012 was calculated. Two main trends are apparent. First, Figure 5 below illustrates that since 1993 aggregate South African manufacturing PCMs are consistently lower than all other broad sectors of the South African economy, with the exception of gold and uranium mining. Second, since 1993 manufacturing PCMs have never exceeded a maximum of 10% and have declined dramatically since 2004. In fact by 2012 manufacturing approaches an aggregate 0% markup. In contrast, the sectors with PCMs between 30 and 40% in 2012 were: Coal mining, Other mining, and Wholesale and retail; between 20 and 30%: Business services, Finance and Insurance, Catering and Accommodation, Services excluding Medical and Dental, Transport and Storage, Electricity, Gas and Steam, Medical, Dental and Veterinary services, and Water supply; between 10 and 20%: Agriculture, forestry and fishing, Communication, Civil engineering and other construction, and Building construction.

**FIGURE 5: SOUTH AFRICAN PCMS BY BROAD SECTOR, 1976-2012**

Source: SASID
Table C1 (appendix) shows that within manufacturing itself there is considerable variation in PCMs. There is a clear general trend of declining PCMs both at the aggregate manufacturing level as well as across the bulk of manufacturing sectors from the 1993-1997 period as compared with the 2003-2007 period and a much sharper decline in the 2008-2012 period. Thus, far from confirming ostensibly “high” and “non-reducing” markups as presented in Figure 4 (and Table A2 of ABF (2008, p. 767)) there is in fact a wide divergence between the results derived by ABF from calculating PCMs using the Roeger methodology and the authors’ estimations replicating their proxy of the Lerner index.

Furthermore, any attempt to account for the significant differences between these results also has to confront the reality-check of a very close correspondence between PCMs calculated according to equation (5) and measures of aggregate sector profitability such as the net markup or net operating surplus (NOS), as defined by Quantec – the compilers of the SASID database the NOS is the net operating surplus of an industry as a percentage of total intermediate inputs plus labour remuneration plus consumption of capital for that industry. It excludes all net indirect taxes (“EasyData,” n.d.).

The disparity between ostensibly “non-reducing” manufacturing markups in a context of declining sector profitability has been raised by Rodrik (2008). Rodrik notes the declining relative profitability of manufacturing in relation to the ‘FIRE’ (Finance, Insurance and Real Estate) sectors of the South African economy. Figure 6 and Table C2 demonstrate very similar trends with respect to sector profitability to the trends for PCMs. This indicates that aggregate manufacturing and various individual manufacturing sectors of the South African economy have been subject to declining relative profitability since 1993 and that most have seen absolute declines in profitability. However, it is critical to emphasise that an aggregated picture of margins or profitability of manufacturing as a whole or a specific individual manufacturing sector should not detract from an appreciation of heterogeneity within each sector.

**FIGURE 6: SOUTH AFRICAN NET OPERATING SURPLUS BY BROAD SECTOR, 1976-2012**

*Source: SASID*
4. THE RELATIONSHIP BETWEEN PRICE-COST MARGINS AND PRODUCTIVITY

ABF seeks to explain sector productivity growth as a function of their PCM estimates of markups. They use labour productivity and Total Factor Productivity (TFP) as the dependent variable for their cross-country estimations and for the South Africa-specific estimates, respectively. Both sets of regressions use proxies of the Lerner index as measures of PCMs.

ABF acknowledges that their regression results are subject to potential endogeneity or spurious regression problems. That is, PCMs may be correlated with the error term of their regression if higher productivity drives higher markups and not the other way around. They therefore seek to control for this problem by using instrumental variables. Instruments must be correlated with the explanatory variable (PCMs) but not with the error term of the regression.

In relation to their regressions using PCMs based on the cross-country Indstat2 sector and Worldscope listed firm datasets, they introduce various measures of import penetration: total imports over output; “the opening of the economy to trade”, industry tradability, and tariff levels (2008, p. 758). They concede that:

Our attempt to control for endogeneity was thus mostly unsuccessful. This means that the OLS evidence above should be interpreted cautiously for, even if we used lagged margins, the lack of good instruments did not allow us to rule out that the relation goes from productivity to margins and not the other way round. (2008, p. 758)

It is particularly striking – given the prominence ABF affords to the claim that South Africa-listed firms display higher PCMs than worldwide – that ABF finds no statistically significant relationship between South African productivity growth and PCMs of listed firms (2008, p. 759). Again it should be emphasised that this does not imply that some SA listed firms do not enjoy high margins and profit levels.

In relation to their regression on the South Africa-specific SASID dataset, ABF adopts a wide range of instrumental variables: computed effective rates of protection, scheduled tariff rates, export taxes and an estimate of anti-export bias (2008, p. 761). However, problems arise with their efforts at instrumentation:

In terms of the quality of our instruments, while all instruments report a low correlation with our measure of productivity growth, only scheduled tariff rates and export taxes show statistically significant partial correlations with the Lerner index measure, and the absolute magnitude of the correlation of all of the trade protection measures with the price-cost margin measure is low (2008, p. 761).

Thus the basis for establishing a causal relationship between price-cost margins and productivity growth is at best ambiguous. Indeed, one area of research identified is “to push further on the search for good instruments for product market competition” (2008, p. 764). Aghion et al. (2013) seeks to address the instrumentation problem indirectly within a model which tests the relationship between trade liberalisation and productivity growth within a General Method of Moments modelling framework, “[c]ontrolling for the impact of product market competition” (2013, p. 444). However, this also encounters problems. In addition to the issues already raised in relation to the measurement of PCMs, Aghion et al.’s measure of PCM gains statistical significance only at the expense of one of their selected measures of trade liberalisation losing its statistical significance, raising questions about the underlying framework. Thus the definitiveness with which ABF reaches the conclusion “that a reduction in mark-ups … should have large positive effects on productivity in South Africa” (2008, p. 764) goes far beyond the evidence actually presented.
5. SOUTH AFRICAN POLITICAL ECONOMY AND ECONOMIC RESTRUCTURING: INDUSTRIAL STRUCTURE, CONDUCT AND PERFORMANCE

It is therefore argued that understanding the complex inter-relationship between industrial structure, conduct and economic performance requires drawing on a broader base of literature and evidence to inform future research.

Economic development is a process of fundamental structural change in which the labour force in developing countries moves from lower to higher productivity activities and in which industrialisation plays a fundamental part. The major source of productivity growth at the initial and intermediate stages is the mastery of existing technologies (Amsden 1992; Lall 1992). This process requires both resources and incentives to undertake the learning processes involved (Khan 2010; Khan and Jomo 2000). It also requires co-ordination mechanisms across private and public investments to identify and realise new industrial opportunities (Hirschman, 1988). Large firms and business groups have played a central role as agents of rapid technology acquisition and diversification (Amsden 2003; Chandler et al. 1999; Studwell 2013). Competition and rivalry are important parts of rapid technology acquisition and industrial diversification, but the required competition bears little resemblance to the textbook definition of perfectly competitive markets (Amsden 1997). Some measure of domestic market dominance combined with strong domestic rivalry and pressures to export give rise to a powerful set of incentives that both provide resources (effectively rents) to invest in capability acquisition as well as pressures to ensure these rents are deployed to do so rather than being dissipated (Amsden 2003; Khan 2010; Khan and Jomo 2000). The scope and shape of industrial restructuring is fundamentally shaped not simply by pre-existing ‘endowments’ and industrial structure but by the detailed specifics of a country’s political economy and the shifting balance of economic and political forces. Modern theorists have described the impact the balance of these forces has on favouring certain economic activities in relation to others variously in terms of ‘systems of accumulation’ (Ashman and Fine 2013), ‘political settlements’ (Khan and Jomo 2000) or ‘elite bargains’ (Di John and Putzel 2009).

Economic reforms intended to raise private investment levels by removing various product and factor market distortions have not succeeded in this objective, but have certainly resulted in widespread corporate and industrial restructuring since 1994. However, there has unfortunately been a parallel decline in academic research focussed on the detail of sectoral and corporate structure relative to the research output during the apartheid period and early years of democracy (Chabane 2006, p. 550).

Nevertheless, some key structural changes can be identified which have a bearing on industrial structure, conduct and performance. Capital account liberalisation since 1994 has contributed to a fundamental shift in relative prices in the South African economy. Long-term capital – much of it embodied in the large conglomerates which became able to shift their primary stock market listing offshore – has left South Africa to be replaced by a much stronger reliance on volatile short-term capital inflows. These inflows have induced long periods of currency over-valuation which have turned the exchange rate against tradable sectors such as manufacturing. They have also provided some of the funding for households to purchase increasing volumes of imported consumer goods – as commercial banks matched short term inflows to similarly short term credit extension to households (Zalk 2013).

This external “Dutch Disease”-type effect has been combined with an internal “Dutch Disease”-type effect with the relative profitability of non-tradable activities and the financial sector in particular increasing relative to manufacturing profitability (Rodrik 2008 and Zalk 2013).
The rise of the “shareholder value” movement both internationally and in South Africa has placed pressure on conglomerate groups to focus on their “core” business lines and divest “non-core” assets. This led to a process of ‘unbundling’ of cross-sector holdings by conglomerates but also to ‘rebundling’ within a number of sectors which have either retained or further entrenched the market power of the largest incumbents. A key question is the impact this process has had on the capabilities of the industrial subsidiaries that were disposed of during this process.

Trade liberalisation has had a differential impact on industrial capabilities and performance. Many capital-intensive resource-processing industries that were close to the global technological frontier have not been impeded by a liberalised trade environment. These are effectively the apartheid infant industries which have grown up in sectors such as petro-chemicals and steel. Privatisation of these state-nurtured natural monopolies into unregulated markets has allowed them to exert pricing power at the expense of downstream industries. Competition policy – itself the outcome of a deeply contested process with dominant firms – has powers to deal with conduct but not pre-existing market structure. Multiple tiers of legal appeal have resulted in the ‘gaming’ of the competition system (Makhaya and Roberts 2013). Simultaneously, the more vulnerable downstream value-adding and labour-intensive sectors have suffered as a result of trade liberalisation from intensive margin squeezes on their sales – due to import competition – and from the monopolistic pricing of their inputs.

In short, South Africa’s post-apartheid economic reforms – ostensibly to remove market distortions and thereby raise levels of firm entry, competition and growth – have had some extremely negative consequences. Capital account liberalisation has shifted relative prices against manufacturing. Trade liberalisation has allowed certain firms to “protect their positions and the supra-competitive returns they earn from them” (Makhaya and Roberts 2013, p. 557) while many value-adding and labour-intensive sub-sectors and firms have been subject to price and cost margin squeezes with attendant firm closures, job losses and precariousness of many existing firms.

6. CONCLUSIONS

This paper leads to a number of conclusions. There is no credible evidence marshalled by ABF that South African manufacturing markups are particularly high, either by international standards or in relation to other sectors of the South African economy. A narrow focus on sectoral PCMs detracts on the one hand from significant heterogeneity within sectors and on the other hand from broader structural patterns within the South African economy which influences the trajectory of the manufacturing sector. Evidence of any clear relationship between markups and productivity growth is at best tenuous. There is thus a sharp contrast between the tentativeness of the evidence base and the definitiveness of the conclusions drawn by ABF.

There are a number of fruitful ways in which research on the complex interactions between industrial structure, conduct and performance can be taken forward. In particular there is a need for detailed sectoral research which explores rather than assumes how various forms of economic rents are accrued in particular sectors and the uses to which they are deployed and relates these processes to the specifics of South Africa’s political economy.
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APPENDICES

Appendix A – Equations

The PCM (µ-1) can be estimated using equation (1):

\[ NSR = (\mu - 1) \cdot \alpha \cdot [\Delta(w + l) - \Delta(r + k)] \]

where: parameters are in natural logs; NSR is the nominal Solow residual; \( \mu = P/MC \) (P=price, MC=marginal cost and \( \mu = 1 \) denotes perfect competition); \( \alpha \) is the labour share in value-added; \( \Delta \) is the difference operator; \( \Delta(w + l) \) is the log change in the wage bill and \( \Delta(r + k) \) is the rental price of capital, which is estimated separately:

\[ R = (i - \pi + \delta) \cdot P_1 \]

where: \( i \) is the yield on 10 year government bonds, \( \pi \) is the expected rate of inflation, \( \delta \) is the rate of depreciation

By rearranging the penultimate equation through which (1) is derived it can also be directly computed:

\[ \mu - 1 = \left[ \frac{\Delta(p + q) - \alpha \cdot \Delta(w + l) - 1 - \alpha \cdot \Delta(r + k)}{\alpha \cdot [\Delta(w + l) - \Delta(r + k)]} \right] \]

where: \( \Delta(p + q) \) is the log change in real value-added and \( (1-\alpha) \) is capital's share in value-added.

Estimation using the Roeger method requires reliable data on each of these variables. Citing lack of reliable capital stock data in both the UNIDO and Worldscope datasets, ABF set out two alternative measures of the PCM in the form of proxies of the Lerner index (Lerner, 1934). These are:

\[ PCM_1 = \frac{\text{value added} - \text{total wages}}{\text{sales}} \]  

and

\[ \frac{pY - W - rK}{pS} \]

where: \( pY \) is nominal sector manufacturing value added (MVA); \( W \) is the sectoral wage bill (average wage rate x no. of workers); \( r \) is the real interest rate plus the sector depreciation rate; \( K \) is the nominal sector capital stock; \( pS \) is nominal sector output or sales.
## Appendix B – Gilbert and Du Plessis survivorship-bias corrected list of “South African Industrial Companies”

<table>
<thead>
<tr>
<th>#</th>
<th>Company Name</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Abercom Group Limited</td>
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<td>2</td>
<td>Adcock Ingram Limited</td>
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<td>3</td>
<td>AECI Limited</td>
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<td>4</td>
<td>African Cables Limited</td>
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<td>5</td>
<td>African Oxygen Limited</td>
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<td>6</td>
<td>Allied Electronics Corporation Limited</td>
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<td>7</td>
<td>Allied Technologies Limited</td>
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<td>8</td>
<td>Alpha Limited</td>
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<td>Amalgamated Beverage Industries Limited</td>
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<td>10</td>
<td>Anglo American Industrial Corporation Limited</td>
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<td>Anglo American Properties Limited</td>
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<td>12</td>
<td>Anglovaal Industries Limited</td>
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<td>13</td>
<td>Aspen Pharmcare Holdings Limited</td>
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<td>14</td>
<td>Barloworld Limited</td>
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<td>15</td>
<td>Beverage &amp; Consumer Industry Holdings Limited</td>
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<td>16</td>
<td>Bidvest Group</td>
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<td>17</td>
<td>Blue Circle Limited</td>
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<td>C G Smith Limited</td>
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<td>Cadbury Schweppes (South Africa) Limited</td>
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<td>Charter - Sterling</td>
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<td>98</td>
<td>Woolworths Holdings Limited</td>
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</table>

*Source: Gilbert and Du Plessis (2013)*
## Appendix C - Data

### Table C1: South African Manufacturing PCMs, 5 year annual averages and inter-period changes, 1993-2012

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*Source: SASID*
Table C2: South African Manufacturing Net Operating Surplus, 5 year annual averages and inter-period changes, 1993-2012

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Source: SASID
FIRM DYNAMICS
Growth and Survival in South Africa

Prof J. Paul Dunne
Rethabile Masenyetse
School of Economics, University of Cape Town

Abstract
A major concern as an economy develops is the evolution of its industrial structure, with a mixture of firms of different sizes being important for innovation and sustainable growth. There is, however, little research on the evolution of the company sector within developing and emerging economies. This paper uses data on a panel of companies listed on the Johannesburg Securities Exchange (JSE) in South Africa with a special focus on those involved in the manufacturing sector during the period 2000 to 2010 from the DataStream service to analyse the changing size distribution, concentration rates and reasons for non-survival. Using the law of proportionate effects framework (following Dunne and Hughes (1994) and others) it evaluates the relative growth rates of large and small companies in general and at sectoral level. Overall, the results suggest that smaller firms are growing faster than larger ones, and more interestingly, it is the very smallest of the small and medium firms that are growing fastest. The policy implications for job creation interventions are not straightforward considering the differences in absolute numbers of the employment generated by small and large firms. It is recommended that greater efforts should be directed towards improving the general business environment, while paying attention to the low survival of smaller firms.
1. INTRODUCTION

One of the major economic challenges facing the post-apartheid government in South Africa is the persistently high unemployment rate, inequality and relatively low economic growth. The severity of these challenges is apparent when South African macroeconomic performance is compared against other emerging market economies. During the period 2002 to 2011, South African GDP grew by an average of 3.6 per cent and only experienced a recession of 1.5 per cent in 2009, largely due to the second-round effects of the global financial crisis. This was similar to Brazil, which grew by an average 3.7 per cent during the period, but considerably less than China and India, which registered average growth of 10.3 per cent and 7.7 per cent respectively. A similar pattern is observed in the growth of GDP per capita. Over the same period unemployment in South Africa averaged 24.4 per cent, much higher than the single digit rates observed in Brazil, China and India. Persistent high unemployment is seen as one of the major failures of the incumbent African National Congress government. Over the years the Government adopted a number of policy initiatives aimed at addressing these challenges. The policies range from the Reconstruction and Development Policy (RDP) and Growth Employment and Redistribution (GEAR) in the late 1990s to the more recent New Growth Path (NGP), National Industrial Policy Framework (NIPF) and National Development Plan (NDP). The NDP is intended as the policy framework to achieve an average economic growth target of 5 per cent per annum, which is just 1.5 per cent from the current average, but it is not clear how this will substantially affect employment.

In order to fully understand the dynamics of the South African economy, it is important to appreciate that its economic structure is closer to that of developed than developing countries (Fedderke 2013). About 67 per cent of total output is contributed by the services sector, with finance, real estate and business services subsectors representing the bulk of the services sector. The secondary sector is the second largest sector in the economy, accounting for 19 per cent of GDP in 2010, while the manufacturing subsector accounted for 12.9 per cent of GDP in 2010 and has been on a downward trend since the 1970s. The primary sector is the smallest of the three and accounted for 10.6 per cent of GDP in 2010, with the mining and quarrying subsector dominant, accounting for 7.5 per cent of GDP. Mining is the traditional bedrock of the South African economy and continues to play a pivotal role in the economy.

The performance of manufacturing has been the subject of discussion in both policymaking and academic circles (Bell 1995). The sector is relatively diversified covering automotive, textiles and clothing, carbon and stainless steel and chemicals, with 94 products accounting for 75 per cent of exports in 2007. This is very high by African standards, with most developing countries merchandise exports dominated by a few products, mainly primary commodities. The leading industry, the automotive industry, has largely benefited from incentives provided by the government, as has the textile and clothing sector because of its high

In contrast, as well as being the largest employer in 2010, the tertiary sector was the only one that experienced employment growth from 2000 to 2010. It grew by 16 per cent over the decade, while the primary and secondary sectors fell by 42 per cent and 11 per cent respectively. There is an issue in interpreting the sectoral employment changes. It is not completely clear the degree to which the changes are structural or simply represent displacement. The change in employment in services is in ‘other services’ and when this has been examined in more detail the big change is in labour brokers, but it is not known which sectors the labour brokers provide labour for (Tregenna 2010).

While it is clearly important to analyse the development of the economy at a sectoral level so as to identify the areas of growth and decline of potential growth in employment, it does not reveal the dynamics within the sectors. The sectors are made up of companies of different sizes and a changing distribution of firms over time can have important implications for an economy. A tendency towards increased (or decreased) concentration

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1 These concerns are discussed in the recent International Monetary Fund (IMF) assessment which concludes that South African economic growth underperforms relative to its peer emerging economies.
within an industry can have implications for competitiveness, innovation, employment and trade in an industry and in the economy as a whole. Studies have looked at competition and different aspects of the industrial structure in South Africa including Fedderke (2013), Fosu (2013), Fedderke and Naumann (2011), Fedderke and Szalontai (2009) and Aghion et al (2008). None of these considered the relationship between firm growth and size, despite the emphasis given to this in the general industrial economics literature.

This paper focuses on this issue and considers the changing distribution of companies in South Africa over the period 2000-2010, using data collected from Datastream and other sources, of companies listed on the JSE. It follows the work of Dunne and Hughes (1994) and others in using the law of proportionate effects (LPE) framework and considers the implications for South Africa. The next section presents the relevant theoretical background and related empirical research on firm growth and survival in emerging and developing countries. Section three discusses the data used and the method of collection, the distribution of firms and their growth and survival over time, with section four analysing the relationship between size and growth to establish whether there is any systematic pattern, using the law of proportionate effects (Gibrat’s law) approach followed by an analysis of the relationship between firm growth and employment creation in section five. Section six presents some conclusions and policy implications.

2. ANALYSIS OF FIRM GROWTH AND SIZE

There is extensive literature on the theory of firm growth and market structure that has been reviewed in a number of articles, including Hart (2000), Sutton (1997) and Trau (1996). This presents the neoclassical theory of the firm as providing the basic starting point towards understanding the theory of firm growth, with assumptions that firms are profit maximising and there exists some equilibrium size of the firm. Firms can grow up to this size and beyond which there is no incentive for further growth or shrinkage, determined by the U-shaped average cost curve. This would imply that faster growing smaller firms are firms moving towards the minimum efficient level. This has been seen as unsatisfactory as there is no evidence indicating the convergence towards the equilibrium size and neoclassical theory has been extended to allow for imperfect competition and economies of scale. Despite these developments Hart (2000) argues that there have been a number of institutional factors advanced since the 1960s to explain the observed faster growth of small firms that render the neoclassical view inadequate. This includes the evidence that average cost curves are more likely to be L-shaped particularly for larger firms and the potential for managerial theories of the firm to successfully explain performance. The dissatisfaction about the neoclassical approach led to more institutional approaches, but also the stochastic approach which argues that the determinants of firm growth rates are complex and determined by a range of factors and behaviour that make treating growth as a random shock on initial firm size. While the approach has been criticised as atheoretical, it has been widely used in empirical work analysing the growth of companies and the changing size distribution of firms. It uses the framework of testing Gibrat’s law, the law of proportionate effects (LPE), on company data that is outlined below and adopted in this study (Dunne & Hughes 1994 and 1993, Sutton 1997, Caves 1998).

While initial studies supported the LPE, recent studies have continually rejected it (Hart 2000). The evidence from emerging and developing markets, however, has been scanty, partly because of the unavailability of firm level data. Earlier studies had mainly used the limited survey data, but availability of stock exchange data has provided a more reliable and comprehensive source. In the case of South Africa the only available study is McPherson (1996) who tested the law of proportionate effects in four developing countries including South Africa, using survey data from two townships in South Africa and comparing the results to those

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1 Gilbert et al (no date) presented at ERSA workshop on Quantitative Techniques for Competition Analysis in March 2013
2 It was used in the 1970s to analyse the reasons for an observed inexorable rise in concentration of manufacturing industry, which led to concern that this would continue and lead to increasing monopoly power (Hannah and Kay 1977).
from other Southern African countries, namely Lesotho, Swaziland Botswana and Zimbabwe. The evidence from the two other BRICS countries include Zhang et al (2009), and Shanthu and Bhadura (2002). Zhang et al (2009) used the data on listed Chinese firms and found that support for LPE was conditional on industry. The studies testing the law in emerging and developing countries are summarised in Table A1 in the appendix.

3. FIRM GROWTH AND SURVIVAL IN SOUTH AFRICA

Information on South African companies listed on the Johannesburg Stock Exchange (JSE) is available from Datastream and data was collected for the period 2000-2010. While focusing on listed companies may be open to criticism for over-representing the large firms, the range of firms covered is relatively large and there is no other comprehensive dataset of firms across the size groups available in South Africa. Jenson (2004) argues that the JSE-listed companies to a large extent represent the characteristics of the corporate sector of the South African economy. The data comprises income statements, profit and loss accounts and the balance sheet for each of the companies during the period and additional non-financial data were obtained from various sources including the Profiles Stock Exchange Handbooks, MacGregor Handbooks and online database, Financial Times top companies online and Who Owns Whom online database. Information on mergers and acquisitions was sourced from the website of the Competition Commission of South Africa and Bloomberg database. Firm age is measured as the year 2005 minus the year in which the firm was founded. The full descriptions of the variables collected are provided as an appendix. To consider the development of the size distribution of firms, data is taken from the first year, 2000, of the period; the middle year, 2005; and the final year, 2010.

The empirical literature has utilised a number of measures of firm size including net sales/revenue, total assets and employment. Smyth et al (1975) and Shalit and Sankar (1977) investigate the interchangeability of the alternative measures and argue that the choice of the most suitable one depends on the question being investigated, but is often the result of data availability. In this study net sales and employment measures are used. Net sales is used as the main measure because it has the least missing values and so provides the largest sample, though in fact the different measures were found to be highly correlated. Employment is used to tease out the relationship between firm growth and job creation in order to inform the resulting policy recommendations.

Considering the evolution of the number of companies listed in the JSE during the period 1995-2010 in Table 1, the larger number of firms in the earlier period reflects some changes in the JSE over the period. This includes allowing for offshore listing. As Burke (2005) explains, the population of the JSE went from 669 in 1998 to 396 in 2004, while at the same time the capitalisation of the JSE almost doubled. The reason for this seems to have been a tranche of unsuited companies listing on the JSE because of a listing boom, with a lot of fund money going into small capitalisations companies for expected large returns, encouraging listings and driving up prices, until the bottom fell out of the market. To prevent such excesses the JSE tightened up listing requirements, and this is apparent in Table 1 for non-financial companies, particularly for 1997-1998. While this change will not affect the analysis of surviving firms, it does impact upon the results in the analysis of non-survivors, which focuses on the reasons why companies did not survive both overall and broken down by size group.

---

4 It may also affect the results of sample selection models used later, as the full number of firms will be included in the survival equation. This is discussed later.
Moving to analyse the changing size distribution of these firms over the period 2000-2010, a useful procedure is to construct a transition matrix over a number of years. Starting with the distribution in 2000 and considering how firms moved (or didn’t) across size groups or out of the sample by 2005 and then repeating this for 2005-2010 gave the results in Table 2. Of the 400 companies that were alive in 2005, 288 (72 per cent) survived to 2010. As expected, the highest survival rate is observed in higher size groups with survival rate of over 90 per cent compared to 54.7 per cent in the lowest size group. Of the surviving companies, 121 (42 per cent) remained in their size groups and a sizable number of the companies moved up to the next size group, with fewer moving beyond three groups. A smaller number of companies moved to lower size groups. The notable downward movement was the two companies that declined from the size groups’ R3-4 billion and R4-5 billion respectively to the lowest size group of less than R0.1 billion. The pattern is similar for the period 2000-2005 as presented in panel 2 of Table 5. There were 518 companies alive in 2000; 294 (56.8 per cent) survived the five years and 139 (47.2 per cent) remained in their size groups. Interestingly, the ratio of firms remaining in their size groups during the five years is comparable with 45.6 per cent found in Dunne and Hughes (1994) in the case of United Kingdom firms. Bigsten and Gebreeyesus (2007) reported 75 per cent in the case of Ethiopia for the five year period.

### TABLE 1: NUMBER OF NON-FINANCIAL COMPANIES IN THE JSE IN THE PERIOD 1995-2010

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Non-Financial Companies</th>
</tr>
</thead>
<tbody>
<tr>
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<td>158</td>
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<tr>
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<td>2008</td>
<td>320</td>
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<td>2009</td>
<td>314</td>
</tr>
<tr>
<td>2010</td>
<td>304</td>
</tr>
</tbody>
</table>
Another important concern is exactly why the companies did not survive. The implications for the economy are rather different when companies are going bankrupt than if they are being taken over while growing. The earlier period has a larger number of firms, but also a considerably larger number and proportion of firms failing. The categories for firms’ deaths are identified as takeover, liquidation, delisting and other. The study departs from Dunne and Hughes (1994) and includes a delisting category in order to investigate the effects of the listing boom identified in the period 1997-1998. Takeover is a general term referring to the transfer of control of a firm from one group of shareholders to another and can take different forms, including mergers and acquisitions (M&A). A merger is seen as being the consolidation of two companies in which one survives and the merged one goes out of existence. In essence, the acquiring firm assumes the assets and liabilities of the merged company, though sometimes the target company becomes the subsidiary of the parent company and does not disappear from the sample.5 Changes in the scheme of arrangement, offers to minorities and offers to shareholders are all considered as takeovers, which may be by other listed companies or by non-listed ones. Liquidations include no dividend liquidation, voluntary winding-up and disposal, while delisting includes voluntarily delisting, suspension and/or failure to comply with listing requirements. Others include unbundling of assets and companies which, based on the available data, cannot confidently be classified. As those categorised as failing to comply with listing

5 A consolidation is when two or more companies form an entirely new entity, so in the panel it will show as a birth. It may be an issue as to the new company is treated as a birth or just a combination of the two in dealing with historical data.
requirements or suspended could be companies in transitory states, such as in the process of being taken over or liquidated, more information was collected to verify the final classification.

As Table 3 shows, the death rate between 2005 and 2010 was lowest in the uppermost size groups and highest in the lowest size groups. Takeover was the main cause of death (13.5 per cent) and varied across the size classes, with the highest proportions in the R1-2 billion and R4-5 billion groups, at 25 per cent each. The figures for 2000–2005 were somewhat different in scale, but had a similar pattern. The death rate was considerably higher, 42 per cent compared to 22 per cent, and the main cause of death was again found to be takeover. To investigate the listing issue, a delisting category was added to the usual categories, which reduced the number in the ‘other’ category, but did not alter the takeover and liquidation categories much. This suggests there was no tranche of firms listing and then delisting, but it is likely that a number of the newly listed firms were liquidated or taken over.

**TABLE 3: SALES SIZE DISTRIBUTION BY TYPE OF DEATH**

<table>
<thead>
<tr>
<th>Companies alive in 2005 by Sales Size</th>
<th>Non-Survivors</th>
<th>Type of Death</th>
<th>Number</th>
<th>%</th>
<th>Number</th>
<th>%</th>
<th>Number</th>
<th>%</th>
<th>Number</th>
<th>%</th>
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<th>%</th>
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</thead>
<tbody>
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<td>Rbn</td>
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<td>Number</td>
<td>%</td>
<td>Number</td>
<td>%</td>
<td>Number</td>
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<td>%</td>
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<td>%</td>
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<th>Number</th>
<th>%</th>
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1) Includes unbundling of assets and unclassified
2) Includes missing and zero values in the second period
4. FIRM SIZE AND GROWTH IN SOUTH AFRICA

Assuming that the factors that influence firm growth are complex and there is no obvious systematic pattern across different sizes of firms implies that the probability distribution of growth rates is the same for all sizes. Thus growth could be treated as random shocks distributed across the size distribution and is the hypothesis representing the law of proportionate effects (LPE). One means of checking whether this holds follows Dunne and Hughes (1994) in looking at the distribution mean growth rates, which should be the same across size classes if the LPE holds there should not be differences in the mean growth rates across the size classes. Table 4 presents the net growth of net sales and standard errors are tabulated across all the size classes. It is clear for both periods that the growth rates are not distributed equally, giving evidence against the LPE, and it is the slowest size classes that show the highest growth rates. There are also interesting differences across the two periods, with the middle size classes registering the highest mean growth for 2000-2005 while companies with sales greater than R10 billion were the slowest growing.

TABLE 4: MEAN GROWTH OF NET SALES

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<td>Std. Err.</td>
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The LPE implies that the log of sales can be tested for normality and following Bigsten and Gebreeysus (2007), Figure 1 presents histograms for the log of sales overlaid by the kernel density functions and the normal distribution for the years 2000, 2005 and 2010. The distributions are relatively close to normal and skewness and kurtosis tests and the Shapiro-Francia test for normality reject the null, suggesting that the LPE is likely to be rejected.
FIGURE 1: SALES DISTRIBUTIONS
A more formal method of testing the law of proportionate effect is using regression analysis. Gibrat’s law states that the probability distribution of growth rates was the same for all sizes of firms.

Estimating the log linear equation above gave the results in Table 5, which confirm the results of the more informal tests above. For 2005-2010 the beta coefficient is 0.805 and significantly less than one. For the earlier period the estimated coefficient was larger at 0.906, but still significantly less than one. The observed difference in the magnitude of the beta coefficient is indicative of some process at play between the two periods. It is important to note that the listing boom noted earlier will not explain these differences as it is only companies that survive over the five year period that make up the sample. However, the result provides evidence that over both periods smaller firms were growing relatively faster than larger firms.

In general the results are in line with earlier studies in finding beta less than unity. Dunne and Hughes (1994) in the United Kingdom for the period 1980-1985 and 1975-1980 found the consistent beta coefficient of 0.93, while for China, Zhang et al (2009) found the beta coefficient of 0.66 for the six year period 1997-2003. It is worth noting that in Zhang et al (2009) beta coefficient tended to increase when the period was shortened to year on year.

TABLE 5: OLS ESTIMATES

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<th>ls2005</th>
<th>Constant</th>
<th>R-squared</th>
<th>Wald(beta=1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL</td>
<td>288</td>
<td>0.805*** (0.0242)</td>
<td>3.418*** (0.325)</td>
<td>0.795</td>
<td>65.44</td>
<td>0</td>
</tr>
<tr>
<td>SMALL</td>
<td>70</td>
<td>0.468*** (0.109)</td>
<td>6.646*** (1.066)</td>
<td>0.214</td>
<td>23.95</td>
<td>0</td>
</tr>
<tr>
<td>MEDIUM</td>
<td>157</td>
<td>0.832*** (0.0594)</td>
<td>2.927*** (0.802)</td>
<td>0.559</td>
<td>7.99</td>
<td>0.0053</td>
</tr>
<tr>
<td>LARGE</td>
<td>61</td>
<td>0.958*** (0.0670)</td>
<td>1.217 (1.108)</td>
<td>0.776</td>
<td>0.4</td>
<td>0.5311</td>
</tr>
<tr>
<td>PRIMARY SECTOR</td>
<td>46</td>
<td>0.958*** (0.0547)</td>
<td>1.264 (0.780)</td>
<td>0.875</td>
<td>0.58</td>
<td>0.4494</td>
</tr>
<tr>
<td>SECONDARY SECTOR</td>
<td>107</td>
<td>0.809*** (0.0381)</td>
<td>3.350*** (0.510)</td>
<td>0.811</td>
<td>25</td>
<td>0</td>
</tr>
<tr>
<td>SERVICES SECTOR</td>
<td>135</td>
<td>0.759*** (0.0372)</td>
<td>4.012*** (0.492)</td>
<td>0.758</td>
<td>41.98</td>
<td>0</td>
</tr>
<tr>
<td>MANUFACTURING SECTOR</td>
<td>94</td>
<td>0.811*** (0.0336)</td>
<td>3.276*** (0.460)</td>
<td>0.864</td>
<td>31.6</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel 2</th>
<th>Continuing Companies, 2000-2005</th>
<th>N</th>
<th>ls2000</th>
<th>Constant</th>
<th>R-squared</th>
<th>Wald(beta=1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL</td>
<td>279</td>
<td>0.906*** (0.0321)</td>
<td>1.583*** (0.417)</td>
<td>0.742</td>
<td>8.55</td>
<td>0.0037</td>
</tr>
<tr>
<td>SMALL</td>
<td>82</td>
<td>0.582*** (0.119)</td>
<td>4.600*** (1.160)</td>
<td>0.231</td>
<td>12.41</td>
<td>0.0007</td>
</tr>
<tr>
<td>MEDIUM</td>
<td>153</td>
<td>1.153*** (0.0630)</td>
<td>-1.672* (0.846)</td>
<td>0.689</td>
<td>5.89</td>
<td>0.0164</td>
</tr>
<tr>
<td>LARGE</td>
<td>44</td>
<td>1.121*** (0.376)</td>
<td>-1.893 (6.127)</td>
<td>0.175</td>
<td>0.1</td>
<td>0.7495</td>
</tr>
<tr>
<td>PRIMARY SECTOR</td>
<td>40</td>
<td>0.740*** (0.0607)</td>
<td>4.176*** (0.813)</td>
<td>0.796</td>
<td>18.36</td>
<td>0.0001</td>
</tr>
<tr>
<td>SECONDARY SECTOR</td>
<td>94</td>
<td>1.045*** (0.0608)</td>
<td>-0.390 (0.804)</td>
<td>0.762</td>
<td>0.54</td>
<td>0.4643</td>
</tr>
<tr>
<td>SERVICES SECTOR</td>
<td>145</td>
<td>0.902*** (0.0450)</td>
<td>1.627*** (0.574)</td>
<td>0.738</td>
<td>4.72</td>
<td>0.0315</td>
</tr>
<tr>
<td>MANUFACTURING SECTOR</td>
<td>83</td>
<td>0.923*** (0.0572)</td>
<td>1.324* (0.757)</td>
<td>0.763</td>
<td>1.83</td>
<td>0.1802</td>
</tr>
</tbody>
</table>

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

It is important to consider whether or not these aggregate results are a reasonable representation of the overall picture, or can be explained by the behaviour of particular difference sectors or size groups. Disaggregation also allows a closer analysis of sectors of particular interest, such as manufacturing. Three size classes were defined to distinguish small, medium and large companies. In doing this the official South African definition
of small company is not followed, for the obvious reason that the sample is drawn from the stock exchange listed companies and is biased towards relatively large enterprises. A small company is defined as one with net sales of less than R0.1 billion. These companies also have an average of less than 500 employees, which is in line with the European Union (EU) definition. Medium companies are the ones with net sales of R0.1-5 billion, while large is above R5 billion. The results are shown in rows 2 to 4 of each panel in Table 5 and show variation across the size classes. Interestingly the results for 2005-2010 show the small and medium sized firms to reject the LPE restriction, but the large firms do not, a feature shared with the 2000-2005 period, but with generally lower coefficients. This implies that in addition to the evidence that small firms tend to grow faster it is also the case that within the small firm group, it is the smaller firms that tend to grow faster, a similar result to Dunne and Hughes (1994).

Below the size results are the results for the three economic sectors – primary, secondary and services. It was also decided to isolate the manufacturing sector, defined as all industries that are in the international standard industrial classification (ISIC) 15-37. The results do show variation across the sectors with the primary sector coefficient for 2005-2010 not being significantly less than one, as shown by the Wald test as reported in the last column. This means that the LPE is not rejected. For the other sectors and manufacturing the coefficient is significantly different from zero, suggesting that smaller firms grew faster than the larger ones. Interestingly the results for 2000-2005 were different with the secondary sector and manufacturing not rejecting the LPE, but the others doing so. It does seem that there is some process of change at work over this time period, moving away from a tendency towards concentration in manufacturing and the secondary sector as a whole, but with the primary sector developing a tendency to concentration in the later period. Certainly the change in results for the primary industry across the periods is striking.

These are intriguing results, but there are a number of specification issues that need to be dealt with. Firstly, it may be that slow-growing small firms, for example, are not growing slowly because they are small per se, but because they are old. If the age of the firm is important this could lead to heteroscedasticity (Dunne and Hughes, 1994). Adding age to the regression did not affect the results. It was insignificant in all equations except the full sample for 2000-2005 and in that equation did not change the rejection of the unitary restriction.

### TABLE 6: OLS GROWTH PERSISTENCE RESULTS

<table>
<thead>
<tr>
<th>Dep: growths20102005</th>
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<th>growths20052000</th>
<th>Constant</th>
<th>R-squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL</td>
<td>213</td>
<td>-0.410***</td>
<td>0.937***</td>
<td>0.200</td>
</tr>
<tr>
<td>SMALL</td>
<td>57</td>
<td>-0.526***</td>
<td>1.472***</td>
<td>0.322</td>
</tr>
<tr>
<td>MEDIUM</td>
<td>117</td>
<td>-0.425***</td>
<td>0.852***</td>
<td>0.255</td>
</tr>
<tr>
<td>LARGE</td>
<td>39</td>
<td>0.242*</td>
<td>0.313**</td>
<td>0.094</td>
</tr>
<tr>
<td>PRIMARY SECTOR</td>
<td>34</td>
<td>0.185</td>
<td>0.785***</td>
<td>0.024</td>
</tr>
<tr>
<td>SECONDARY SECTOR</td>
<td>77</td>
<td>-0.491***</td>
<td>0.844***</td>
<td>0.304</td>
</tr>
<tr>
<td>SERVICES SECTOR</td>
<td>102</td>
<td>-0.392***</td>
<td>1.016***</td>
<td>0.188</td>
</tr>
<tr>
<td>MANUFACTURING SECTOR</td>
<td>68</td>
<td>-0.618***</td>
<td>0.860***</td>
<td>0.408</td>
</tr>
</tbody>
</table>

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Second, there is the possibility of the existence of persistence, or serial correlation, which could invalidate the test. To check this the current period is explained by growth in the previous period, firm growth in the five year period 2005-2010 was regressed on growth in the previous five year period and the results are presented.

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6 These results are available from the authors on request.
in Table 6. Of the 518 companies alive in 2000, about 217 companies survived through the two periods. For the aggregate, first period growth is statistically significant but the R-squared is only 0.2. The coefficient is also statistically significant for the small, medium and large companies. In the economic sectors the coefficient is significant in both secondary sector, services and manufacturing, but not in the primary sector. There is evidence of persistence, but this is for companies that survived over the whole period 2000-2010, so may not have a particularly large impact on the results of the growth equations. It certainly suggests that the parameter estimates are consistent rather than unbiased, with any bias likely to increase the value of the parameter estimates. This implies that there is a stronger case for any rejection of the LPE restriction that beta is equal to one.

Third, an important concern in the literature is that of sample selection bias, as the OLS regressions above only include companies that have survived over the estimation period. If the non-surviving companies share certain characteristics, such as that they are slow growing, then this can obviously bias the estimation results. For example, it is possible that most of the companies that ‘died’ were of a particular type, small and slow-growing, as opposed to big and slow-growing. This would mean that the coefficient estimates would be biased. One means of dealing with this is to use the Heckman sample selection model, which starts with a survival equation that estimates the probability of survival based on opening size and then uses that probability, suitably transformed, in the growth equation specification to deal with the bias. This model can be estimated using the standard Heckman two-stage procedure or simultaneously, using a maximum likelihood procedure. The maximum likelihood procedure does have some advantages and is chosen here with the results presented in the appendix Table A3 (Dunne & Hughes, 1994).

Table 7 presents a summary of the two sets of results and comparison of the maximum likelihood and OLS estimations, where missing values imply non-convergence of the procedure. The maximum likelihood estimation results for 2005-2010 show that the coefficients are similar but lower than the OLS ones, for the total sample, except for the primary sector which remained the same. The null hypothesis of beta coefficient being equal to unity is being rejected in all equations except for the primary sector and it was not possible to get a maximum likelihood estimate for the large firms. Lower coefficients with a similar pattern of rejections of the null was also evident for the earlier 2000-2005 period, particularly for the aggregate and services sector equations. No ML results could be obtained for the primary and manufacturing sectors.

A further concern is the possibility that the age of the company may be important. This would mean for example that some slow-growing firms might be like that not because they were small, but because they were old and thus different from the young small firms. To deal with this potential omitted variable bias all of the results were re-estimated introducing age as an independent variable. For both periods the age variable was insignificant and had little effect on the results.

**TABLE 7: SUMMARY MAXIMUM LIKELIHOOD AND OLS EQUATIONS**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL</td>
<td>0.726*</td>
<td>0.780*</td>
<td>0.805*</td>
<td>0.906*</td>
</tr>
<tr>
<td>SMALL</td>
<td>0.458*</td>
<td>0.568*</td>
<td>0.468*</td>
<td>0.582*</td>
</tr>
<tr>
<td>MEDIUM</td>
<td>0.769*</td>
<td>1.151*</td>
<td>0.832*</td>
<td>1.153*</td>
</tr>
<tr>
<td>LARGE</td>
<td>……..</td>
<td>1.156</td>
<td>0.958</td>
<td>1.121</td>
</tr>
<tr>
<td>PRIMARY SECTOR</td>
<td>0.958</td>
<td>……..</td>
<td>0.958</td>
<td>0.740*</td>
</tr>
<tr>
<td>SECONDARY SECTOR</td>
<td>0.764*</td>
<td>0.925</td>
<td>0.809*</td>
<td>1.045</td>
</tr>
<tr>
<td>SERVICES SECTOR</td>
<td>0.691*</td>
<td>0.782*</td>
<td>0.759*</td>
<td>0.902*</td>
</tr>
<tr>
<td>MANUFACTURING SECTOR</td>
<td>0.753*</td>
<td>……..</td>
<td>0.811*</td>
<td>0.923</td>
</tr>
</tbody>
</table>

* reject the null that the coefficient in 1
…no convergence
5. FIRM GROWTH AND EMPLOYMENT

So far the focus has been on the changing size distribution of firms with respect to sales measure. However, what is more relevant in the African context is the changing distribution of firms in terms of employment. The finding that the smaller firms tend to grow faster is useful, given the emphasis that is often put on the role of small firms in job creation. Furthermore, as Dunne and Hughes (1993) discuss, small firms may grow quickly, but they may not be particularly good at creating sustainable employment, given the variance of their growth rates and high rates of failure. The loss of employment from the closure of one plant in a major company is also going to require a lot of growth from a lot of small firms. It is, therefore, of considerable interest to look at the dynamics of firm growth in terms of employment.

Unfortunately, as mentioned, the reporting of employment in the dataset is much worse than for sales and moving to employment, reducing the number of companies by 50 per cent. Recognising the limitations that come with a reduced coverage and the likelihood that the missing data is not randomly distributed, it seems worthwhile to analyse the data that is available.

Table 8 below presents the distribution of employment across size class and shows that the companies that employed less than 500 employees had the highest mean growth of employment in both periods and the largest size class the slowest. In fact for 2000-2005, the mean employment growth in the more than 10000 size class and the 1000-5000 size class declined. This decline in employment is in line with an observed decline in employment during the period in both primary and secondary sectors in South Africa and Table 8 locates the loss of employment in the very largest size categories. The results are consistent with the sales data in suggesting that the law of proportionate effects will be rejected for the companies in South Africa in both periods.

### Table 8: Employment Changes by Size

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N Mean</td>
<td>N Mean</td>
<td>2005</td>
<td>2010</td>
<td>Change</td>
<td>N Mean</td>
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<tr>
<td>&lt;500</td>
<td>36 0.70</td>
<td>80 0.2</td>
<td>12 14</td>
<td>2</td>
<td></td>
<td>29 0.68</td>
</tr>
<tr>
<td>500-1000</td>
<td>17 -0.11</td>
<td>23 0.7</td>
<td>17 19</td>
<td>2</td>
<td></td>
<td>19 0.14</td>
</tr>
<tr>
<td>1000-5000</td>
<td>46 0.26</td>
<td>64 2.5</td>
<td>162 165</td>
<td>3</td>
<td></td>
<td>48 -0.03</td>
</tr>
<tr>
<td>5000-10000</td>
<td>16 0.17</td>
<td>23 6.8</td>
<td>157 141</td>
<td>-16</td>
<td></td>
<td>21 0.09</td>
</tr>
<tr>
<td>&gt;10000</td>
<td>41 0.07</td>
<td>44 33.2</td>
<td>1460 1475</td>
<td>15</td>
<td></td>
<td>34 -0.16</td>
</tr>
</tbody>
</table>

*growth is calculated as the difference of the logarithms

Moving on to testing the LPE, the estimation results in Table 9 below show the LPE to be rejected for all companies over the period 2005-2010, but not rejected for the other size categories and all sectors, except for the constructed manufacturing sector (and the primary sector at 6 per cent). These results are different to those for sales and it is important to remember the reduced sample, but they seem to imply that the smaller firms grow faster when looking at all companies and that this is driven by companies in manufacturing. This implies that employment growth was random across the size distribution for employment for many sectors, meaning that there is an underlying trend towards concentration in the shares of employment in large companies.
The results for 2000-2005 were very different, though this might have been expected given the differences in growth observed in Table 8. The LPE was rejected for all companies, small companies and all sectors except manufacturing. In this case the smaller firms grow faster and within the small firm category it is the smaller firms that grew fastest. These results are closer to those found for sales.

Consider the robustness of the results, Table 10 below presents a comparison of the sample selection model maximum likelihood estimates and the OLS results. For all companies, the results for both periods are a bit lower than the OLS and so provide a more significant rejection of the null. Across all the other categories the test results are consistent and the coefficients of similar magnitude. This implies that the OLS results are robust to sample selection.
6. CONCLUSIONS AND POLICY IMPLICATIONS

Analysing the changing size distribution of firms in terms of sales has produced some interesting results that have policy implications. Using sales, takeover was found to be the main cause of death for 2005-2010 and varied across the size classes, with the highest proportions in the R1-2 billion and R4-5 billion groups. Just under half of all non-survivors in the smallest size category were taken over. The figures for 2000-2005 were somewhat different in scale, but had a similar pattern. This suggests that a major cause of non-survival among small firms is takeover. The policy issue is then whether the firms are taken over to improve efficiency or to reduce potential competition and this is something in need of further research. When testing the LPE, smaller firms were found to be growing relatively faster than larger firms and in the small category it was the very smallest that were growing the fastest. There was some variation across sectors, with LPE not rejected for the primary sector. The LPE was also rejected for the manufacturing sector in the period 2005-2010 and this was consistent when employment was used. There was also some variation in the results for the earlier period, 2000-2005.

This heterogeneity indicates the presence of some process of change at work over this time period and makes it difficult to draw general conclusions, but it is clear that, in general, smaller firms are growing faster than larger ones and that takeovers are a major explanation of the exit of firms. Non-survival is most prevalent in smaller firms. Both of these conclusions are encouraging, and initial policy implications can be drawn. Consistent with the experience in other countries, smaller firms tend to be influential in employment creation but what is clear is that in aggregate the larger firms create more jobs and continue to do so over long periods. Thus while policies that encourage and support smaller firms need to be introduced, as they are a basis for entrepreneurship and innovation, this should not be to the detriment of large companies. In other words, rather broad-based improvement of the business and investment climate are needed, particularly in the manufacturing sector. Policy needs to be focused on productivity enhancing interventions, so that the local companies can regain competitiveness in the low skill and medium skill industries. This includes training on basic skills. Future research needs to look at other aspects of firm growth to strengthen this recommendation.

---

**TABLE 10: SUMMARY MAXIMUM LIKELIHOOD AND OLS EQUATIONS - EMPLOYMENT**

<table>
<thead>
<tr>
<th></th>
<th>ML</th>
<th>OLS</th>
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<tbody>
<tr>
<td></td>
<td>le2005</td>
<td>le2000</td>
</tr>
<tr>
<td>ALL</td>
<td>0.897*</td>
<td>0.783*</td>
</tr>
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<td>0.761</td>
<td>0.556*</td>
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<tr>
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<td>0.986</td>
</tr>
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<td>0.892</td>
<td>1.043</td>
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<td>PRIMARY SECTOR</td>
<td>0.692*</td>
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<td>SECONDARY SECTOR</td>
<td>0.94</td>
<td>0.759*</td>
</tr>
<tr>
<td>SERVICES SECTOR</td>
<td>0.963</td>
<td>0.848*</td>
</tr>
<tr>
<td>MANUFACTURING SECTOR</td>
<td>0.783*</td>
<td>0.953</td>
</tr>
</tbody>
</table>

* reject the null that the coefficient is 1
What the results also mean is that industrial policies aimed towards small firms are unlikely to provide a means of reducing unemployment significantly. The results for employment size distribution, while limited in relevance by lack of data, do illustrate the issues. In 2005, the mean employment for companies employing less than 500 people was 151 compared with 33178 people in companies employing more than 10000 and total employment by companies employing less than 500 class was 12083, which was less than one per cent of the total employment generated by firms in the more than 10000 class. Despite their slow growth, the large firms have a bigger impact on employment generation. This, coupled with the high death rate among small firms, casts doubt on whether jobs created by small firms will last. This conclusion is supported by Kerr et al (2013) who, using labour force survey data for South Africa, found that small firms cannot be net job creators in South Africa. Page and Soderbom (2012) argues that in order to create ‘good’ jobs a broad-based policy aimed at improving the business environment in general instead of tying the intervention to firm size is required.

This is not to say that small firms are not important. The nature of the data used here, focussing on listed companies, will tend to miss the smallest companies and bias the results towards larger companies. There is also no consideration being given to the informal sector. Nevertheless, the results do question the emphasis on small firms that is often found in policy. While they are an important part of a healthy economy providing innovation, competition and a healthy industrial structure, they are unlikely to be important for net job creation in the future. Thus the State needs to focus on policies that are broad-based, in the sense that it should not be size-specific, but it does need to be aware of the dangers of concentration. As the main cause of death is takeover, the Competition Commission, which is already legally charged with approval of any mergers and acquisitions in South Africa, has an important role to play in maintaining competition in markets.

It would appear that despite the high growth rates of smaller firms the focus of job creation and maintenance will need to be in the larger size classes and any job creation schemes will also need to consider the likely impact on competitiveness, entry barriers and concentration.
References

## APPENDIX

### Table A1: Recent Evidence from Selected Emerging and Developing Countries

<table>
<thead>
<tr>
<th>Study</th>
<th>Period N</th>
<th>Country</th>
<th>Size Measure</th>
<th>Sample Estimation Method</th>
<th>Results</th>
</tr>
</thead>
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<td></td>
<td>Period: N=277 Country: Swaziland</td>
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<td>Sample: Survey of micro and small enterprises Method: OLS</td>
<td>Rejects the law</td>
<td></td>
</tr>
<tr>
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<td>Period: N=599 Country: Lesotho</td>
<td>Number of workers</td>
<td>Sample: Survey of micro and small enterprises Method: OLS</td>
<td>Rejects the law</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Period: N=206 Country: Botswana</td>
<td>Number of workers</td>
<td>Sample: Survey of micro and small enterprises Method: OLS</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Period: N=345 Country: Zimbabwe</td>
<td>Number of workers</td>
<td>Sample: Survey of micro and small enterprises Method: OLS</td>
<td>Rejects the law</td>
<td></td>
</tr>
<tr>
<td>Variable</td>
<td>Description</td>
<td>Source</td>
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<tr>
<td>---------------------</td>
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<td>--------------</td>
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<tr>
<td>ls2000</td>
<td>Log of net sales in 2000</td>
<td>Datastream</td>
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<td></td>
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<td>Log of net sales in 2005</td>
<td>Datastream</td>
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</tr>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>Log of net sales in 2010</td>
<td>Datastream</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>s2010_num</td>
<td>Net sales in 2000</td>
<td>Datastream</td>
<td></td>
<td></td>
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### Table A3: Heckman Maximum Likelihood Estimations - Sales

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Standard errors in parentheses  
*** p<0.01, ** p<0.05, * p<0.1
## Table A4: Heckman Maximum Likelihood Estimations - Employment

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- Insigma: -0.200*** | 0.338*** | 0.433*** | -1.103*** | 0.381*** | -0.451*** | -0.748*** | -0.00390      |
|        | (0.0572) | (0.128) | (0.122) | (0.114) | (0.140) | (0.0901) | (0.0923) | (0.0994)      |

- Wald(Beta=1): 7.8 | 0.78 | 1.82 | 1.83 | 5.45 | 1.3 | 1.04 | 6.64       |
|        | 0.005 | 0.3768 | 0.177 | 0.1761 | 0.0195 | 0.2522 | 0.3077 | 0.01         |

- N: 201 | 58 | 99 | 44 | 31 | 75 | 95 | 61         |

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- Insigma: -0.140 | 0.150 | 0.554*** | -0.272** | 0.000894 | -0.112 | -0.232 | -0.667***     |
|        | (0.0860) | (0.240) | (0.0869) | (0.121) | (0.152) | (0.122) | (0.163) | (0.132)       |

- Wald(Beta=1): 38.83 | 8.28 | 0.03 | 0.05 | 20.5 | 14.9 | 10.72 | 0.62         |
|        | 0 | 0.004 | 0.8617 | 0.8222 | 0 | 0.0001 | 0.0011 | 0.4328        |

- N: 234 | 56 | 141 | 37 | 29 | 96 | 109 | 86         |

Standard errors in parentheses

*** $p<0.01$, ** $p<0.05$, * $p<0.1$
Abstract

The redesign of the local financial system in post-apartheid South Africa was undertaken with the aim to establish a flourishing manufacturing-based SME sector. In turn, this was expected to create a broad-based inclusive recovery, built around sustainable new industrial jobs, increased average incomes, greater use of new technologies and (so) rising productivity, and progress towards greater social inclusion and equality (World Bank 2011). Inevitably, with the neoliberal project in its ascendance in the 1990s, the guiding operational and strategic principles that underpinned the redesign of all local institutions in South Africa were very much drawn from the standard neoliberal financial model (McDonald and Smith 2004).

The paper details how adherence to core neoliberal imperatives has resulted in the construction of a local financial system in South Africa that has proved to be spectacularly unsuited to the promotion of sustainable manufacturing-led growth. By far the most pressing concern today is the massive growth in the microcredit sector (Bateman 2013). Some analysts naively see microcredit as a perfect foundation for local economic development in South Africa (Moyo 2009). However, what has transpired instead is the embedding of a powerful ‘anti-development’ trajectory, one that has dangerously de-industrialised, informalised and primitivised already weak and unbalanced local economic spaces (Bateman 2010; Chang 2011; Bateman and Chang 2012). The paper argues that attention must urgently turn to the construction of a local financial system that can efficiently promote sustainable longer-term SME development on behalf of the entire community, rather than simply maximise the financial rewards attributable to a narrow band of CEOs and shareholders.
1. INTRODUCTION

It is increasingly recognized around the world that an effective local financial system is a pivotal prerequisite for sustainable bottom-up local economic and industrial SME development (World Bank 2001, Guiso, Sapienza and Zingales 2004). Very simply, a local economy requires a local financial system capable of intermediating scarce financial and other resources into the highest productivity uses. This means an ability to deliberately and efficiently channel financial resources into manufacturing led SMEs that are capable of upgrading and generating a range of important local economic and social outcomes, including sustainable high skill jobs, technology transfer, increased product and process innovation, quality subcontracting capacity, import substitution and exports. Such a local financial system would in due course be classed as a ‘developmental’ local financial system (Bateman 2013).

However, it is also widely recognized that such a ‘developmental’ local financial system largely does not exist in South Africa today. In fact, what has emerged instead in the post-apartheid years is almost the complete opposite: South Africa today has what has been called an ‘anti-developmental’ local financial system, notably characterized by the astonishing spread throughout the country of the market-driven model of microcredit. When not supporting wholly unproductive and dangerously unsustainable consumption lending (see below), the local financial system in South Africa today absorbs South Africa’s scarce financial resources and intermediates this largesse into very short-term high interest rate loans suitable only for the very lowest productivity ‘no-growth’ informal microenterprises and self-employment ventures. As elsewhere, such as in post-Communist Eastern Europe (Hardy and Rainnie 1996), in Latin America from the 1980s onwards (IDB 2010), and in Africa as a whole (Chang 2010: 157-167), the result in South Africa has been a calamity: an enterprise structure that imparts no long-term ‘bottom-up’ sustainable development impetus whatsoever.

The purpose of this paper is to begin to respond to the urgent need to reform, restructure and reconfigure the local financial system in South Africa in the direction of it becoming far more ‘developmental’ than at present. If substantive manufacturing led SME development is to be anything more than a mere slogan in South Africa, then the South African government must take concrete and urgent steps to proactively help establish a radically new pro-active local financial system. Such a local financial system would be far more capable of efficiently promoting a sustainable manufacturing led SME development trajectory that confers benefit across the entire community, but particularly upon its poorest constituents, than the present local financial system in South Africa, which is primarily geared up to maximising the financial rewards attributable to a narrow stratum of CEOs and other senior managers, individual and institutional shareholders, and local and international investors.

The paper starts with an explanation of why the local financial system is so important to the development of a sustainable manufacturing led SME sector. It then outlines key elements in the Fashion and Textile Industry (FTI) that are receptive to the right type of policy intervention, especially financial intervention. Section 4 briefly introduces a number of important international examples where the FTI sector was amenable to policy intervention and what this might mean in the South African context. Section 5 outlines some key policy recommendations for South Africa. The conclusion is that only by actively learning from, and adapting for local use, a number of key non-neoliberal examples will South Africa’s policymakers be able to create a local financial system geared up to sustainable manufacturing led SME growth and development.
2. THE CRUCIAL ROLE OF THE LOCAL FINANCIAL SYSTEM IN UNDERPINNING LOCAL INDUSTRIAL DEVELOPMENT

During the period in which the neoliberal policy agenda was globally dominant (approximately 1980-2000), developing countries were firmly instructed to leave the allocation of scarce capital resources as much as possible to markets and the private sector, which, working together, would efficiently allocate capital on the basis of maximizing private returns. In the neoliberal-oriented international development agencies, this narrow intermediation mechanism has always been seen as optimal by definition (for example, see World Bank 2002). By the same token, there was no need for any non-market or ‘artificial’ (i.e. state coordinated at any level) diversion of financial resources into certain types of enterprises, clusters of enterprises or sectors.

However, a pivotal aspect of the Local Developmental State (LDS) model, which economic history shows is responsible for much of the economic development success in many of the fastest-growing countries (Bateman 2000), was the establishment and continual upgrading of a local financial system amenable to the attainment of key local industrial policy objectives. The origins of such a local financial system often differ. Some highly effective local financial systems were historically rooted in a wide variety of state initiatives and generally leftist social and political movements, notably the cooperative movement and trade unionism, such as in Germany, Italy, France, Spain and the Scandinavian countries. Elsewhere, equally effective local financial systems emerged out of a state-building and political legitimacy-seeking context, and to specifically play a role within an emerging industrial policy. Examples of this typology would include post-war Japan, South Korea, Taiwan, many parts of Latin America, Thailand, Malaysia, Indonesia, China and Vietnam.

Either way, economic history overwhelmingly points to the fact that it is possible to construct and maintain a local financial system that is able to efficiently establish, guide, encourage and cajole public and private financial resources into key growth-oriented industrial sectors, including the crucial manufacturing led SME sector, and away from far less productive uses, such as informal microenterprises and self-employment ventures, consumption spending, speculative uses and ‘capitalist consumption’. Put simply, the financial system can be designed to not just directly underpin key growth-oriented industries, sectors and enterprise clusters, but also to indirectly support the local enterprise sector by financing a wide variety of technologies and product and process innovations that, if successful, can be taken up and incorporated into marketable local outputs.

What, then, are the constituent parts of a ‘developmental’ local financial system? In mainstream economics, as much as in the narrower field of the study of institutions, it is always difficult to isolate cause and effect. Notwithstanding, it is possible to outline a set of core institutions and operating principles that economic history shows are generally most conducive to successfully implementing a local industrial policy.

The core function of the local financial system is to efficiently mobilize capital (through savings, taxes, government investments) and channel this capital into the best possible investments. In turn, the ‘right’ type of enterprise to support would be small, medium or large enterprises that have the following characteristics:

- It is formally registered and operating according to all legal requirements
- It operates at, or well above, minimum efficient scale
- As much as possible it operates on the technology frontier
- It is innovation and skills-driven rather than (just) low labour cost-driven
- It operates horizontally – clusters, networks – and vertically – sub-contracting, supply chains, public procurement – productively inter-connected with other organisations
- It is able to continually facilitate the creation of new organisational routines and capabilities.
Economic history has also helped to define the ‘wrong’ type of enterprise to avoid supporting, among other things in order not to waste scarce financial resources. A ‘wrong’ enterprise is loosely the mirror image of the ‘right’ enterprise, and is defined by a number of obvious characteristics:

- It is typically a simple microenterprise or one-person self-employment venture
- It is informal
- It has no functional links to other local enterprises (subcontracting, clustering) or to the community (taxation, adherence to health and safety legislation)
- It operates below minimum efficient scale
- It is low/no technology-based
- It is driven more by low wages rather than innovation or skills upgrading
- It has almost no concern for the environment
- It is very often petty trade-based.

An optimum financial system is therefore increasingly widely seen as one that can most efficiently channel sufficient capital through to the ‘right’ enterprises while avoiding support for the ‘wrong’ enterprises (on this, see also King and Levine 1993, Levine 2005). Indeed, many localities have evolved an approximation to just such an efficient local financial system.

It is widely accepted that in many parts of Europe, notably in post-war West Germany, France, Italy, Switzerland and the Scandinavian states, as well in the United States and post-war Japan, that local community-owned and controlled financial institutions have played a pivotal role in local economic and industrial success. By ‘community-owned and controlled’ is meant a dense local network of cooperative banks, savings banks, credit unions and other financial institutions that constituted the mainstay of many local financial systems in what might be called pre-neoliberal times. Some of these local financial institutions were constituted as not-for-profit, such as credit unions, but more of these institutions were structured as for-profit. The crucial point here is that the operating modality in these historic examples always reflected an overall aim of promoting long-term local development above all short-term profit considerations. Financial self-sufficiency and profitability (or surplus) was often important in order to ensure the institution’s survival and gradual growth via reinvestment, but profit was the means to a greater end, not the end itself (as in so many financial institutions operating during the neoliberal period).

The actual institutions that are of importance here are, first, well-functioning financial cooperatives and cooperative banks. From the mid-1800s onwards, such financial institutions were typically established by individual social reformers, but then accorded legitimacy within the community once it was seen that it would operate to the benefit of that community. Examples include the cooperative banks of northern Italy, which, once recapitalised and restructured after 1945, went on to play a decisive role in rebuilding Northern Italy’s SME-based industrial sector (Goglio and Alexopoulos 2011). In particular, important lessons can be learned from the northern Italian region of Emilia Romagna. This was once a poor region that began to flourish in the post-war era largely due to patient cooperative bank support for a manufacturing led SME development trajectory that built upon the region’s largely destroyed military-industrial complex (Capecchi 1990). Serving the SME sector at the local level are the German savings banks (sparkasse), which have been very successful in promoting a bottom-up industrial development trajectory (Hakenes et al. 2014).

Spain provides two important examples here: one famous, and the other much less so. The first is located in the Basque region of northern Spain. The Caja Laboral Popular (CLP) attached to the famous Mondragon Cooperative Complex has proved over 50 or more years to be a very successful promoter of manufacturing-based cooperative enterprises (Bateman, Girard and MacIntyre 2006). Such is its diligence, as well as the quality of technical support, worker training and business planning, that the CLP has only ever had to deal with a handful of failed cooperative enterprises in its entire existence. As Ellerman (1982) concludes, the CLP’s long-term loans and other financial support measures effectively laid the basis for an entire regional economy based on local manufacturing and innovation.
The other less recognized example from Spain is Cajamar. Located in Almeria Province in the south of Spain, Cajamar is today the largest cooperative bank in Spain. Its importance is that it served as the core driving force behind a local economic development success story that, very much like the Basque country, turned a once-poor backwater and Spain’s poorest region into one of Spain’s (and Europe’s) richest and most productive regions. The ‘Almeria Model’ that has been carefully distilled from this experience (Giagnocavo, Fernandez-Revuelta Pérez and Uclés Aguilera 2012) is based around Cajamar’s self-appointed active role in local economic and community development (deemed necessary since most local government capacity was destroyed by the civil war) and, in particular, its patient support for clusters of agro-industrial SMEs serving an increasingly intensive agricultural sector. In addition, as Cajamar’s own capacity developed, it was able to become a constant source of further social innovation, technology acquisition and transfer, and other forms of social and economic development. Giagnocavo, Fernandez-Revuelta Pérez and Uclés Aguilera (2012: 107) conclude their summary of Cajamar’s contribution as one where, ‘a cooperative bank, in concert with the cooperative movement, was able to co-construct an economically stable community through sustainable innovation’.

Alongside cooperative banks formed by civil society, many state-directed local financial institutions can play an important role within a ‘developmental’ local financial system. Once again after 1945 in Europe, many countries attempted to reconstruct through a variety of local state-coordinated financial institutions. These were established with the specific intention that they would underpin newly formulated local industrial policies that were being pushed through by newly elected local and regional governments. In post-war West Germany, this meant the Landesbanken, or regional state-owned banks, which were established to provide low cost funds to the famous Mittelstand (medium-sized industrial enterprises). In Northern Italy, this meant the state-owned but locally operated Special Credit Institutes (SCIs) that, as Weiss (1988) carefully documents, very successfully provided large quantities of affordable financial support (10 year loans at low interest rates) for machinery purchase and workshop modernisation. In post-war Japan, Friedman (1988) shows that the local state was heavily involved in establishing networks of municipal banks and special funds attached to local governments.

East Asia’s rise to dominance from the 1960s onwards is largely attributable to a range of sophisticated financial intermediation policies, especially involving state development banks (Chang 2006). Newly ‘de-landlordised’ farmer-owned credit cooperatives were important in South Korea in facilitating successful rural agricultural sector reconstruction in the immediate post-civil war period. Later, eight government funds and a credit guarantee scheme, among other financial interventions, combined to establish an effective industrial SME development trend (Leipziger and Petri 1993), one that turned out to be especially decisive in building quality subcontracting capacity that could serve the large family-owned enterprises (chaebols). Elsewhere in Taiwan, Thailand, Malaysia and Indonesia, local branches of state-owned development banks successfully facilitated rural industrialisation and industrial SME development through manufacturing led SMEs (Wade 1990, Meyanathan 1994).

Learning much from these earlier successful examples, China supported its important TVE sector through newly established rafts of urban and rural credit cooperatives (UCCs and RCCs) set up and largely controlled by local governments (Girardin and Ping 1997). Importantly, the RCCs and UCCs were incorporated into local development plans, and so both could receive additional core funding and other forms of support from local government. Local government ownership also gave local savers the confidence necessary to mobilize sufficient local savings (for example, local people knew their savings would not be wasted supporting heavy ‘rustbelt’ industries in the north of China). Later, Vietnam closely followed China’s model and established a similar very sophisticated set of local financial institutions under local government control and oversight, which also proved capable of successfully supporting rural industrialisation and industrial SME development (Bateman 2010, 191-198).

In Latin America from the 1950s onwards, and in spite of some obvious limitations, state bureaucracies nevertheless proved vital in providing financial support to numerous industries and smaller suppliers through Import Substitution Industrialisation (ISI) policies (Amsden 2004b). Brazil’s state development bank, BNDES, has almost uniquely provided the driving force behind that country’s recent economic miracle. It did this by judiciously supporting key large enterprises (famously such as the aircraft manufacturer Embraer), but also the SME sector, both directly with affordable loans and indirectly through the extensive use of local content agreements attached to its large company investments.
A third constituent part of a ‘developmental’ local financial system is the private banking sector, by which is generally meant private, often family owned, banks that are embedded within a mix of dense regulations and societal/community obligations. Unlike the majority of profit-maximising banks, these banks have often provided an impetus and incentive structure to efficiently support local economic development for reasons other than just pure profit-maximisation. Once again in northern Italy, the big pre-war commercial banks had little interest in directly assisting the post-war reconstruction process, preferring instead to use what resources they had to underpin the hugely profitable post-war business in importing consumer goods for middle and upper class Italian consumers. However, smaller private banks in communities to which they felt an obligation were more willing to support the reconstruction of the local industrial and agricultural sectors, offering low cost loans, grace periods and other benefits to ensure that projects they supported had the best chance of success.

This positive process of embedded local obligation and horizontal mutual support structures has been described by Becattini (1990) as the ‘theory of the local bank’. This insight was useful in helping to explain why the local financial system in northern Italy was such a positive factor in local economic development compared to its counterpart in southern Italy, where the local financial system was embedded within vertical patronage (and often criminal) networks which engendered very little trust, reciprocity and mutual support structures (on this, see also Putnam 1993).

Overall, therefore, a ‘developmental’ local financial system involves a mixture of cooperative, local state and community-oriented (rather than [just] profit maximizing) financial institutions that have no problem working together in order to promote key local industrial development goals through the SME sector. The precise arrangements governing the operation and coordination of these local financial institutions will be dependent upon an individual locality’s and country’s own history, economic structure, balance of class forces, international relations, and other idiosyncratic factors. The general approach here is to mobilise funds and socialise the risk involved in providing long-term affordable financial support to the ‘right’ industrial and agro-industrial SME enterprises and, it must be emphasised, which the market on its own would not otherwise provide.

3. CASE STUDY: SAVING SOUTH AFRICA’S FASHION AND TEXTILE INDUSTRY (FTI)

3.1 Background

To help illustrate some of the practical operational and strategic development problems in South Africa’s industrial SME sector, it is useful to focus on one sector. Given its historical importance to South Africa’s development, and its current difficulties, the Fashion and Textile Industry (FTI) sector is an appropriate example to choose. Moreover, it is also possible to compare developments in South Africa with the history of comparable FTI sectors elsewhere, which is done in Section 4, and thereby obtain a fuller picture of the barriers to industrial SME development as well as some of the local financials system solutions in these other countries that might have some relevance to South Africa.

South Africa’s FTI sector has its origins in the manufacture of blankets in the early part of the last century. Already the major industrial centre in South Africa in the early 1900s, the city of Johannesburg initially became the core of the FTI sector as well, with some supplementary development in the Western Cape Province in the main city of Cape Town. During the apartheid era, however, restrictions on the use of African labour in urban areas began to push the FTI sector out towards Durban and Cape Town where there was a large pool of low-cost Indian and Coloured labour. Cape Town gradually became the leading city for the FTI sector producing for the main retail chains, many of which were headquartered in Cape Town and which exerted significant influence over the supply chain. Meanwhile, Durban evolved to become the centre for the much lower priced segments of the FTI market.
The FTI sector evolved into one of post-apartheid South Africa’s most important industrial sectors, accounting for important shares of output and exports. However, the fall of apartheid in South Africa coincided with the arrival on the global stage of ultra-low cost Asian competition in the FTI sector, especially from China (including Hong Kong). As in most countries at the time, this development put South Africa’s FTI sector under enormous pressure. In spite of substantial growth in demand for textile products in recent years in South Africa, its domestic enterprises were unable to service this demand at the prices/quality expected, and it was met instead by increased imports from Asia. With South Africa’s FTI sector running into serious difficulty, over 2007-8 the South African government imposed a series of quotas on Chinese FTI-related goods.

However, this measure failed to halt the decline in the FTI sector, suggesting instead that the structure of the FTI sector was problematic and could no longer compete on the domestic market. In addition, a wide variety of inputs required by the FTI sector were also increasingly met by imports. Imports from China (including Hong Kong) thus went from just under 17% of total rand value in 1995 to nearly 80% by 2005 (Morris and Reed 2008, 18). In addition, FTI prices dropped as a result of the global glut of textile products produced by Asian nations, further undermining local South African FTI producers. A similar problem was registered on the exports side. The FTI sector was initially able to rapidly increase its exports in the post-apartheid era until around 2002, but then an equally sharp decline became evident as Asian competition around the world began to make itself felt. The FTI sector today is largely based in the regions of the Western Cape and KwaZulu-Natal, with some minor FTI activities undertaken in Gauteng province. The KwaZulu-Natal FTI cluster of enterprises has evolved into the primary location for mass market FTI production, while the Western Cape has evolved in the opposite direction into the location for higher value added design-intensive and niche market products mainly situated in medium to large enterprises. Cape Town has retained its importance as the site of most of South Africa’s higher-end FTI work as well as being the location for the top five retailers who account for around 70% of the formal clothing market in South Africa (Morris and Reed 2008). In short, South Africa’s FTI sector has effectively fallen between two stools; on the one hand, the Cape Town cluster of FTI enterprises has not been able to forge a place for itself in the global economy (yet) on the basis of high-value added ‘just-in-time’ fashion outputs using the latest technologies backed up by significant capital investment; on the other hand, the KwaZulu-Natal cluster of FTI enterprises has had little success in locating for itself a place in the global economy as a mass-market producer based on low cost labour and scale economies (ibid 36).

One of the main strategies to date to try to ensure the survival of South Africa’s FTI sector has been a ‘low road’ squeeze on the labour side, with minimal wages and poor working conditions increasingly the norm. This trajectory has involved a move to a more Cut-Make-and-Trim (CMT)-focused mode of operating which involves fewer capital costs, coupled with the growing informalisation of the FTI sector as inputs are increasingly sourced from formal and informal microenterprises and home-workers. While this has cut costs in the FTI sector operations, it has also and inevitably lowered the FTI sector’s ability to compete globally into the long-term. The alternative to this ‘low road’ strategy - a ‘high road’ strategy based on accelerated capital investment, machinery upgrading and worker training – had to be rejected because of the shortage of capital on affordable terms and maturities.

Because of growing FTI-related imports, and particularly because of the decline in value chain capacity in South Africa, the South African Government through the Department of Trade and Industry (DTI) and its deployment arm, the Industrial Development Corporation (IDC), embarked on an extensive incentive programme. Foremost of the incentives on offer were the Clothing and Textile Competitiveness Improvement Programme (CTCIP) and the Production Incentive (PI) which assisted firms in competitiveness and capital upgrading respectively. Recent (August 2012) information released by the DTI indicates that to date these incentives have been broadly successful and, among other things, the decline in employment has been halted. In addition, the South African government’s 2010 Industrial Policy Action Plan was introduced to support the country leverage more local procurement in order to assist local production by overhauling the Preferential Policy Framework Act and assigning points in the tender process to those firms that procure locally.
Overall, however, South Africa's FTI sector remains in serious difficulty. According to knowledgeable industry sources, while not all of the problems are finance-related, many of the most important barriers to success are. In particular, formal financing in the FTI sector (including South African government funding through the IDC) generally requires a minimum of R1 million or more. This means that FTI sector SMEs that wish to expand are simply unable to access formal financing either because they simply cannot afford to service such a large loan, or else because they are not ‘bargaining council compliant’ and are therefore ineligible for any government-linked low interest loans. In general, the commercial banks and South African government programmes resist supporting operating costs in the FTI sector. There is simply too much risk involved in financing product development, raw material purchases, logistics costs, and so on, and where there is little chance of any return on any investment in less than 4 to 6 months.

As a result of such financial sector issues, the future for the FTI sector in South Africa remains problematic. But how have other FTI sectors reacted to the very same global pressures currently being vectored against South Africa's FTI sector? For further important policy insights it is useful to briefly analyse a number of other high-profile FTI sectors to gauge the reaction of policy-makers to globalisation pressures and whether or not these insights hold any lessons for the South African context.

4. LEARNING THE FINANCIAL LESSONS FROM ‘BEST CASE’ FTI DEVELOPMENT EPISODES

The FTI sector has historically played a major role in many countries that sought to escape their origins of under-development, low productivity informal employment and generalised poverty. Even more important, in many of these cases the FTI sector proved especially responsive to a variety of state interventions and industrial policy measures that combined were able to ensure the deployment of efficient organisational structures, technological upgrading, and high quality yet affordable final products (Amsden 2001). In particular, appropriate financial sector institutions and financial policy measures helped to underpin the development of the FTI sector where conventional market-driven private financial institutions refused to do so. This section provides thumbnail sketches of three important FTI sectors that have responded to the pressures of globalisation and the rise of Chinese competition in different ways and have deployed various financial measures to retain a meaningful FTI sector.

4.1 Denmark

Denmark’s FTI sector has survived and, in fact, prospered in spite of a very high cost base, a factor often seen as a major barrier to long-term success thanks to the entry of ultra-low-labour cost China into the global FTI sector. In 2012 the Danish FTI sector registered turnover of nearly $10 billion, of which around more than a half was exported. The FTI sector is the 4th largest export sector in Denmark spread across 600 enterprises operating under the 4 largest enterprises – Bestseller, BTX, DK Company and IC Company (Dansk Fashion and Textile 2013).

In common with many SME sectors in the 1980s and 1990s, a process of consolidation took place in the FTI sector as a response to lower cost producers emerging around the world, especially in the case of China. The Danish government could either allow the FTI sector to contract, or else take positive steps to restructure the industry: it chose the latter option. As part of its wider industrial policy in the late 1990s of rebranding Danish products in order to compete on fashion, innovation and ‘Danishness’, rather than (just) low cost, the Danish FTI sector underwent a radical transformation. Effectively piloting the change was the Danish government, which wanted to maximise its strengths in knowledge/creativity-based industries. As one fashion industry researcher remarked,

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1 Personal communication with Anita Stanbury, Executive Director of the newly formed South African National Fashion Council (SANFC).
‘As I see it, the Danish government found an interest in the fashion industry, because it demonstrated a successful transformation from being a production based industry to a knowledge (design and sale) based industry.’

(quoted in Salonoja 2013: 53).

In the early 2000s, the Danish government embarked on a project to establish Copenhagen as the fifth global fashion centre, after the four cities recognised as the leading centres: Paris, London, New York and Milan. This was the key to ensuring that the FTI sector was reborn, and ultimately would expand. The Danish Fashion Institute (DAFI) was established in 2005 to promote a Danish fashion identity. DAFI was started with, and is today mainly financially supported by, the Danish government, though some membership fees later came on stream to support additional activities.

Financial support issues were crucial especially given the systemic reluctance of conventional private sector financial institutions to support start-up enterprises. Since 1914, when the first cooperative bank was established, Denmark’s cooperative banking sector has provided sustained support for growth-oriented SMEs, especially in key agro-industries (Chlupkova, Svendsen and Tingaard 2003). Notably, the cooperative banking system was decisive in facilitating the supply of long-term low cost capital that allowed Denmark’s famous dairy and pork sectors, both of which sectors were almost entirely organised along cooperative lines as well, to become globally important industries.

In more recent (neoliberal) times, new go-go private financing mechanisms have appeared, such as venture capital funds, business angels and, most recently, ‘crowd-funding’. But it is generally accepted that, while highly visible and suitably ‘cool’, in practice such initiatives cannot hope to fund anything more than a very small percentage of potentially viable industry-based start-ups. Moreover, given their roots in traditionally conservative agricultural communities, Denmark’s cooperative banks have been reluctant to respond to the much riskier types of industrial SME projects that require financial support.

Since the 1990s, therefore, a large number of new state-supported programmes have been introduced to promote industry-based SME development in sector deemed to represent future innovation and growth opportunities for Denmark (OECD 2008). The FTI sector was included. These financial institutions include state-backed Innovation Incubators founded after 1998 and which capitalise R&D-driven start-ups emerging from Denmark’s University sector and its raft of Science Parks. There is also the Vaekstfonden, which is a state-sponsored investment fund that was established in 1992 with around €300 million. Although initially intended to fund high-technology start-ups and expansions using leading edge technologies, more recently the Vaekstfonden has become an almost purely commercial venture capital fund.

After 2007, however, especially when a new government reform was passed, the provision of basic business advice and financial support for start-ups became more the responsibility of local government. Many innovative new programmes have been introduced, with much focus on new start-ups being able to export as soon as possible, not least because after 2008 domestic demand in Denmark slumped as a result of the global financial crisis. For existing SMEs with growth potential, regional ‘Centres for Growth’ now exist to provide financial and technical support. In the FTI sector, one of the programmes launched was the ‘Fashion Accelerator’ targeting SMEs in the FTI sector in Copenhagen and Central Denmark. SMEs linked to the programme receive a package of support measures, including access to generous low cost financial support.

Recent trends shows that the Danish FTI sector is not just managing to survive in the face of Chinese competition, but to grow. Support from state institutions has been important in previous years, along with support from Denmark’s many non-state financial institutions, including its cooperative banks. More recently, the commercialisation of the financial sector that took place in the period prior to the collapse on Wall Street in 2008, made life somewhat more difficult for low-profit FTI sector enterprises.
4.2 The region of Emilia-Romagna, Italy

Originally a region focused on making straw hats, after 1945 the FTI sector in Emilia-Romagna rose to become a regional export success and in the 1970s accounted for as much as 18% of employment in the region. The FTI sector is organised into clusters operating in different parts of Emilia-Romagna, with each cluster capable of completing all the requirements to produce the final product. The initial FTI cluster was located around the city of Carpi, but FTI activities later emerged in the provinces of Modena, Reggio Emilia and Ferrara.

The key to Emilia-Romagna’s post-war success was a series of major investments undertaken, first, to identify potential new FTI products that would aid in the urgently required diversification process, and then, second, to actually begin producing a range of new FTI products. Because financial support for such ‘blue skies’ activities was (and is) highly risky it is largely shunned by the private sector; it was, instead, mainly the preserve of the public sector, or local non-public financial institutions with a major interest in the long-term health of the local community. Above all, the Emilia-Romagna experience is instructive with regard to the importance of patient institutional support to the enterprise sector.

A key institutional milestone behind FTI sector success in Emilia-Romagna was the founding in 1974 of ERVET – the regional development agency. ERVET was charged with establishing a number of sectoral and inter-sectoral bodies that could provide high-level support services to enterprises in the region. One of the first such bodies founded by ERVET was CITER (Emilia-Romagna Textile Information Centre), which was set up in 1980 in the district of Carpi and with a specific mission to promote the FTI sector. Membership of CITER centrally included ERVET, but also other key stakeholders including the Chambers of Commerce, business associations and more than 400 SMEs involved in the FTI sector (Sölvell, Lindqvist and Ketels 2003). The early success of CITER led to many more such centres across Emilia-Romagna and across northern Italy. One of the most important innovations introduced and perfected by Carpi’s FTI sector was a form of ‘just-in-time’ production termed ‘Pronta Moda’.

This involved the production of small batches of the most up-to-date fashion items at low costs using state-of-the-art machinery and technology, which were then released on to the market at precisely the most appropriate sales period (such as Christmas and summer holidays).

From the 1990s onwards, however, the FTI sector in Emilia-Romagna and especially in Carpi, came under major threat, the massively increased competition coming from low labour-cost Asian countries, especially from China. The immediate result was that from the mid-1990s onwards, a growing number of FTI sector small enterprises began to exit the market. It also did not help that neoliberal ideas began to dominate European governments in the 1980s, and especially in Italy from the mid-1990s onwards under the various governments of Prime Minister Silvio Berlusconi. One immediate result of the new ideology was that central government funding for all regional governments was cut back, particularly to leftist governments such as in Emilia-Romagna. In addition, thanks to a series of upheavals in the Italian political system in the 1980s, the post-war dominance of leftist parties in Emilia-Romagna began to come to an end, and the old big business elite began to reassert its pre-war power once more (Restakis 2010). Public financial sources were increasingly diverted away from public/state institutional capacity-building and directed towards individual businesses instead, a process sometimes known as ‘corporate welfare’.

As a result of these developments, inevitably ERVET and CITER came under intense scrutiny. Both were increasingly forced to refocus and commercialise their activities in order to make do with less state support and generate their own funding to keep going. For example, CITER was initially 100% funded by the public authorities, but ten years later this figure was down to only 30%, with the other 70% financed through a combination of membership fees and the winning and undertaking of consulting projects (Humphrey and Schmitz 1995). However, this neoliberal-inspired ‘earning ones keep on the market’ mode of operation gradually pushed CITER into supporting FTI projects that had a short-term commercial pay-off, thereby

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2 The academic term for this technique, coined by Piore and Sabel (1984), is ‘flexible specialisation’. 
allowing CITER to generate lucrative consulting fees, while increasingly ignoring FTI projects that generated a much larger and/or longer-term development and economic growth pay-off, but which would not generate sufficient funds in the short term to cover CITER’s required consulting fees. Thus, right when the FTI sector actually needed an even more robust, patient and focused institutional response than ever before, the almost exact opposite trajectory began to emerge.

The FTI sector only finally began to stabilise in the mid-2000s. CITER itself was able to restructure itself and, crucially, it was largely able to revert back to its former pro-active public agency role, rather than serve as one of a number of consultancy outfits seeking contracts. Accordingly, CITER redoubled its efforts on the promotion of innovation and knowledge transfer, creating networks involving local Universities, research centres and individual enterprises, and disseminating information on new market opportunities to its members. In addition, professional training in the FTI sector was significantly improved with the founding of Carpiformazione, a public agency dedicated to professional training. Carpiformazione specialised in providing courses in all aspects of the FTI sector, including within small enterprises in the supply chain (Mariotti and Zirulia 2008).

One of the historically most important aspects that accounts for the great success of the FTI sector in the region, and an innovation that still helps out enormously even today, was the willingness of FTI firms, often with regional government advice and support, to organise themselves into consortia (consorzi) in order to obtain better access to affordable capital. By forming into a sort of credit cooperative, the consortia can obtain a large loan from a local cooperative bank at very low interest rates and long maturity, which was then divided up between members according to their needs. Importantly, all of the members of the consorzi collectively guaranteed the loan from the cooperative bank. Restakis (2010: 81) remarks that,

‘So successful are these consortia, and the default rates so low, that the large national banks have been trying to break into this market for years, with little success. The smaller regional banks provide for almost all of the region’s capital needs’.

The most recent indications are that the FTI sector is just about standing up to competition from lower cost Asian countries, largely thanks to a variety of collective interventions that to an extent have been able to disperse the famous clusters in order to assure their survival. One method here has been outsourcing some parts of the production chain to lower cost countries in Europe, such as Romania. While many predicted the FTI sector in Emilia-Romagna would significantly contract under globalisation pressures, this has not been the case. While some employment has been lost compared to the booming 1980s, the FTI sector in Carpi, and in Emilia-Romagna overall, has succeeded in remaining a major driver behind regional growth.

4.3 Turkey

The FTI is a major sector in the Turkish economy. In 2009, Turkey was the world’s seventh largest exporter of textile products and the fourth largest exporter of finished clothing (WTO 2009). In 2009, the FTI sector accounted for $22.3 billion, or one fifth of Turkish exports (Lau, Suvankulov and Karabag 2012). The bulk of formal employment (up to 85%) in the FTI sector is located in micro and small enterprises (up to 10 employees), but when informal employment is included, this more than doubles the extent of employment involved to around 2 million (Ministry of Industry and Trade 2010). Key aspects of competitiveness are the ability to diversify very quickly in order to meet changing demand patterns abroad. Importantly, Lau, Suvankulov and Karabag (2012) emphasises that managers employed in the FTI sector highly value the support provided by the Turkish government and its regional units. This support has taken numerous forms, including support for R&D and innovation. One of the major barriers to sustained growth in the FTI sector identified by the Turkish government is widespread informality (Ministry of Industry and Trade 2010, 129). Among other things, informality debars an FTI company from participating in important state support programmes and obtaining bank finance.

Growing global competition, especially from China, has inevitably put at risk the important contribution of the FTI sector in Turkey to employment and exports. The Turkish government has responded with a twin-track
strategy of financially encouraging the most labour-intensive activities (such as the basic production of cloth) to relocate to less-developed eastern cities, while expanding the crucial design, fashion and finance arms into clusters operating in the more sophisticated and fashion-conscious cities of Istanbul and Izmir (Ministry of Industry and Trade 2010, 131).

After a long history supporting Turkey’s export and import trade, in recent years Turkey’s banks have begun to engage more actively with the manufacturing sector, including Turkey’s SMEs working in the FTI sector. Overall, the share of bank credit directed to SMEs has risen markedly since 2001 (Ministry of Trade and Industry 2010, 85). However, in spite of this recent progress, it is also recognised that the banking sector remains comparatively unsupportive of the SME sector, and it lags most other European countries in this respect. One central issue is the much higher profitability/lower transactions costs involved in working with consumer loans, the supply of which has massively expanded in Turkey in recent years. The result, as the Turkish government was forced to conclude in 2010 (Ministry of Trade and Industry 2010: 86), is that, “While a more rapid growth in consumer loans and credit cards continues, loans to companies, and especially to SMEs, are limited”. The result is that the shortage of financial support for the SME sector is today seen as a very serious handicap in terms of promoting the sustainable development of the SME sector across all activities, especially including FTI.3

The seriousness of this financial problem eventually forced the Turkish government to step in and begin to provide special support to encourage the banks to finance SMEs and for loan guarantees to be provided. In the booming years of the 2000s, sufficient financial resources were available to underpin these programmes, and the SME sector was able to access more financial support than hitherto. But since 2008 the situation has changed markedly, and the Turkish government has less ability and resources to push private sector banks into supporting the SME sector.

In short, Turkey’s FTI sector has expanded since the 1990s to become one of the country’s major export and employment sectors. This growth initially took place against a background of limited financial support, one of the results of which was to directly and firmly embed the FTI sector in the informal sector, where it remains.

4.4 Core lessons pertaining to the financial sector

The examples above help to illustrate several points of relevance to the South African FTI sector as it seeks to restructure and survive in an increasingly competitive world market.

First, long-term financial support provided at appropriate terms and maturities is clearly critical to building a strong FTI sector. In the case of Denmark and Italy, the socially-oriented cooperative banking sector was the mainstay in providing long-term working capital finance for the FTI sector, allowing for major episodes of equipment upgrading, new product development, and other initiatives. In both countries, a number of new jazzy financing mechanisms emerged in the later (neoliberal) years – business angels, venture capital – but while these financing structures garnered media publicity, they generally contributed very little in terms of underpinning the FTI sector in any real sense. In Turkey, on the other hand, the market-driven private commercial banks provided little favourable support to the FTI sector over the years, preferring to fund their activities on regular terms, while few other forms of financing were forthcoming from elsewhere. The key issue was that the private banks could generate more profit working in other areas, such as trade financing, construction and consumer loans, and so had little reason to venture into the already risky FTI sector with special discounted interest rate programmes in search of business. With few other sources of finance, and in spite of its labour cost advantage, it was almost inevitable that Turkey’s FTI sector would increasingly move into the informal sector.

3 Moreover, the recent financial sector problems experienced in Turkey, and its dramatically declining currency in particular, are seen as the inevitable outcome of a banking sector that effectively allowed itself to become dangerously over-concentrated on serving the consumer sector at the expense of the SME sector.
Second, alongside external sources of financial support, state support is generally required for the important start-up phase. Comprehensive programmes in Denmark emerged out of a major state effort to retain as much of the FTI sector as possible, if not expand its influence, and this led to a major bottom-up impetus via new entrants. Similarly in northern Italy, the regional and local state’s sophisticated advisory and support structures, notably CITER, turned out to be world-leading structures when linked to equally sophisticated sources of finance, such as the famous consorzi. Once again, Turkey’s experience was different, eschewing all forms of dedicated support for start-ups.

Third, both business and financial support to the FTI sector cannot generally be constructed to act as a for-profit business itself. This is to say that the popular neoliberal imperative of transforming all enterprise support programmes into profitable activities in their own right, has been proved quite wrong. Enterprise development is an investment in the local economy, not a profitable business opportunity. Failure to understand this important point led both Denmark and Italy into diluting their once-sophisticated non-financial and financial support structures, though in later post-neoliberal years this degradation was reversed. In Turkey, where free market (neoliberal) policies have long prevailed, both financial and non-financial support structures were always implored to generate their own revenues – ‘earn their keep on the market’ – and so offered little real long-term support to the FTI sector.

5. LOCAL FINANCIAL SYSTEM RESTRUCTURING IMPLICATIONS FOR SOUTH AFRICA

The above discussion, and especially the financial issues raised in the finer-grained look at the FTI sector in South Africa and in three important FTI sectors elsewhere, raises a number of basic policy issues for the South African government to consider, not just in relation to the FTI sector, but more generally.

First, there can be no doubt that for-profit local commercial financial institutions have seriously underperformed on behalf of local communities in South Africa in the period since the collapse of apartheid. Ideology notwithstanding, spectacular profitability and dividend payment opportunities that are appropriated by a narrow elite are simply not consonant with the efficient provision of financial services, particularly to manufacturing led SMEs. Instead, South Africa’s poor have simply been plunged into a form of microdebt peonage thanks to an adverse process that social geographer David Harvey (2006) has termed ‘accumulation by dispossession’. Thus, while the private commercial banking sector has its role to play locally, it should not be expected that this role will include extensive provision of dedicated long-term financial support to manufacturing led SMEs.

Second, the range of local financial institutions involved in the successful promotion of the SME sector around the world strongly suggest that, first, diversity is important, but also, second, that some form of community ownership and control of a financial institution is absolutely paramount. The brief examples of the FTI sector success described in Section 4, as well as much data from elsewhere around the world, shows that there is no ‘one size fits all’ local financial system. Instead, adaptability and innovation seem to be the key issues, as well as control by the community of a financial institution in a way that embeds longer-term development goals as much as, if not more than, mere financial self-sustainability.

Third, there remains much scope to ensure that a robust manufacturing led SME sector in South Africa can still compete, but this will require – at a minimum - the construction of a suitably effective local financial system. Economic history shows that, if the local financial system is specifically geared up to this important task, there is much scope to significantly improve the chances of retaining a meaningful manufacturing led SME sector. This means, however, that the conventional orthodox (neoliberal) specification for what is an ‘efficient’ financial system in South Africa – that it must primarily aim to maximise its own profitability which it does by
supplying capital to those activities that are best able to repay a loan at as high an interest rate as it is possible to levy – must be rejected. Such a financial system has not addressed the many and varied issues involved in successfully promoting manufacturing led SME development in South Africa.

Instead, we need to establish a local financial system that is able to assist in the promotion of a manufacturing led SME sector rather than restrain it as at present. It is clear that, even though it generates massive financial rewards for its CEOs and local and international shareholders, the South African financial system has nevertheless evolved into a patently inadequate structure with regard to development, and specifically as regards manufacturing led SME development. Economic history shows that this divergence is actually a quite common occurrence, as 1993 Nobel Economics prize winner Douglass North pointed out in his groundbreaking book on the role of institutions in development (North 1990).

‘The organizations that develop in this institutional framework will become more efficient – but more efficient at making the society even more unproductive and the basic institutional structure even less conducive to productive activity.’

Douglass C. North (1990:9)

The following is a set of policy interventions that experience and analysis of the local situation suggest might constitute a suitable package for South Africa in its drive to establish and sustainably expand a manufacturing led SME sector.

5.1 Establish a local/municipality SME development bank

After many years of being unjustifiably criticised, the state development banking concept is now returning to the mainstream. Important examples from economic history are now receiving far more attention as possible role models for other developing countries to follow (Amsden 2007) and even more so in the aftermath of the global financial crisis (Marois 2013). Moreover, many developing country officials, including from South Africa (Timm 2011), are heading to Brazil to evaluate the adaptability to their own circumstances of Brazil’s extremely successful state development bank, BNEDES. This rediscovery process also includes local and municipality development banks that are specifically designed to work with the SME sector. Post-war West Germany’s ‘Landesbanken’ (regional state-owned banks) were crucial support structures as much in the former industrial heartlands (all destroyed by mid-1945) as they were in the rural areas seeking to industrialise in small environmentally-friendly units. Northern Italy’s experience with Special Credit Institutes also stands out. It should also be remembered that much of the good work undertaken by Brazil’s BNEDES is through its local branches, which are embedded within the local community and understand its needs and potentials.

Also in the United States, one of the most successful regional development banks is the state-owned Bank of North Dakota. Formed in 1919 to free the local population from the clutches of the large private banks in New York and Chicago that were charging high interest rates on farm loans, the Bank of North Dakota has since then been a major supporter of local businesses and farms. In addition, it not only prospered without the need for Wall Street-style salaries and bonuses, and survived the global financial crisis without the need for any state bail-out, it also continued in its role as a major contributor into the state’s budget.¹

The key outcome of the state-led SME development bank approach is that it can promote cutting edge new enterprises that are inherently risky, long-term focused and grow through ‘learning by doing’, the type of enterprises which virtually all other financial institutions will not touch as potential clients.

A similar local state-led SME banking institution is possible in South Africa. Indeed, there has already been much experimentation in South Africa with national state banks. Here, however, the emphasis would be on creating a local development banking structure with longer-term perspectives and an industrial developmental

focus. The bulk of the lending and other support would be targeted at manufacturing-based SMEs with growth prospects either through exports or inclusion within local supply chains. The core idea is that a more secure and affordable financial service will help suppliers operating within large enterprise supply chains to invest more willingly in key technologies and quality control, thereby to provide a ‘better’ input (higher quality, lower cost, just-in-time) to the large enterprise. And rather than expecting that its activities will be able to ‘pay their own way’, there must be a realisation that development cannot be a costless activity, and that public investment will be needed upfront to capitalise such an institution before any real development returns are generated.

Having said that, over the longer term it is possible for such a development bank to take equity stakes in any enterprises supported and which, when eventually cashed in if the assisted enterprise is a success, can cover a proportion – often a very high proportion - of the running costs of the bank.

Support for such a community development banking model, and its ability to avoid the most destabilising aspects of the contemporary orthodox financial system, also comes from one of the most astute critics of financialised capitalism, Hyman Minsky. It is now accepted that Minsky’s theories on financial instability under capitalism constitute the most accurate prediction of the 2008 global financial crash and its precise mechanism (Minsky 1986). Less well-known was that Minsky’s rejection of orthodox financial institutions led him to propose (Minsky 1993) a bottom-up alternative in the shape of a network of for-profit community development banks, operating under the umbrella of a national state-owned banking body that would provide guidance, support, regulatory oversight, and bulk funding. The rationale he gave (in the United States context) was that ‘the vitality of the (...) economy and democracy depends on the continual creation of new, small, and novel enterprises (ibid: p 34). Minsky believed that only community development banks could marry social responsibility to the need to develop new, and expand existing, manufacturing and other innovative enterprises in the community, thereby avoiding the short-sighted and casino-speculative mentality increasingly ingrained in the orthodox private commercial banking system.

Further underlining the importance and feasibility of a dedicated local bank serving SMEs and, in particular, SME suppliers to large enterprises, one can draw on Europe's experience with specialised SME development banks formed by large and often state-owned companies in order to better finance their crucial supplier networks. Even in countries where the local financial structure is famously deep, such as in Germany,\(^5\) such dedicated SME development banks are vitally important to improve the chances of local manufacturing led SME development, particularly through supply chain development. For example, both largely family-owned BMW and partly state-owned Volkswagen have long had their own SME banks that efficiently finance their local supplier networks, and in so doing provide an important comparative advantage to the parent company and as importantly, to the locality.

Most recently, in view of the growing unwillingness of Europe's private banks to fund industrial SMEs in the aftermath of the global financial crisis (banks increasingly prefer to rebuild their depleted capital base by working with higher profit/lower risk consumer loans, housing mortgages and trade financing), many large industrial enterprises are effectively being forced into resolving the problem more directly through their own SME development bank. One notably example is that of state-owned Airbus, the world's largest aircraft company, which announced in February 2014 that it was acquiring a small German private bank, Salzburg München Bank, in order to provide capital for its crucial SME supplier base at much lower rates and longer maturities than are currently on offer. In in view of the problems that the Boeing Corporation experienced with their Dreamliner 787 aircraft because of poor suppliers, it was hoped this new SME bank would allow Airbus's suppliers to patiently reinvest in the technologies and equipment required to ensure the very highest quality outputs.\(^6\)

\(^5\) Germany's well-known regional banking system was deservedly praised for its ability to provide low cost loans to the renowned medium-sized enterprise sector (mittelstand). However, in the 1990s, at the behest of the United Kingdom in particular, the European Union was forced to push Germany’s state banks to become more commercial, or even to privatise, precisely because such banks gave German SMEs a major advantage over British SMEs! This provides yet another example of an efficient institution being destroyed simply because of ideology.

In South Africa, thanks to the self-sufficiency necessities forced on the apartheid government, there exists a broadly positive history of state banking linking to SME development. Many of the country’s most important industrial SMEs locate their origin in affordable loans granted to them by state banks. However, while today the aims of such state banks – to preserve white minority rule – are naturally invalid, there is nevertheless something to learn from the operating methodologies used in this period. In particular, it appears that many of the industrial SMEs supported were indeed able to use the financial support, allied to other business support services, to successfully integrate into local supply chains and, eventually, to export as well (mainly to other African states). There would seem to be no reason why such valuable experience could not today be turned into ensuring the successful establishment of a municipality-driven SME development bank today.

Several important issues would need to be resolved, however. First, capitalisation of the bank would likely have to be ensured through government sources outside of the municipality in question, which would inevitably mean having to deal with national political pressures of one sort or another. Second, corruption and nepotism would need to be minimised at the local level by ensuring transparency and openness in its running. Given that this presents a major problem today in South Africa, real thought will have to go into resolving the issue of how to ensure that a municipality-led SME bank can genuinely locate and support those SME projects with the highest potential from a development point of view. Third, and partly a way of dealing with the issues just raised and partly because of the inevitability of there being limited funds, a very clear operating mandate would have to be developed to ensure that the new bank used its limited funds to focus on key interventions, rather than disburse funds to unconnected projects where the impact will be limited. Fourth, another issue to consider relates to scale issues, which are present whenever a small local bank extends credit to local SMEs, especially if mainly in the same sector. The inevitable potential of mass default if industry-wide conditions change adversely can be dealt with by ensuring that all local banking units are linked into an apex development banking unit, or serve as units of the state development bank, so as to spread risk and information around the system.

5.2 Financial cooperatives and cooperative banks

The municipality-based development banks noted in the section above are important in supporting risky investments in SMEs if the potential upside benefit to the local economy is sufficient. Financial cooperatives/cooperative banks, on the other hand, are generally more risk-averse and opt to prioritise the preservation of the value of the savings of members above more risky enterprise development strategies. Nonetheless, by adopting a long-term ‘patient’ approach to finance, most financial cooperatives and cooperative banks have historically been very effective in meeting the important working capital needs of local industrial SMEs. Indeed, in terms of providing large quantities of finance on appropriate terms and maturities, robustly regulated financial cooperative and cooperative banking structures have much to recommend them. The history of cooperative banking shows that local communities determined to promote a bottom-up process of local economic development can begin to mobilise their own financial resources, on the one hand, and channel those resources into the best possible growth-oriented SME projects, on the other.

There are a number of core issues to consider here. First, there is the extent to which local individuals and enterprises will support the project. A sufficient level of community support is required to ensure that a cooperative bank will succeed, not just through the deposit-taking function, but through its ability to reliably interact with the local business community in order to identify the best SME projects to support. A wide multi-stakeholder group might be involved in the establishment of such a cooperative bank, but ideally its long-term management will be chosen by individual saver-members. In both the northern Italian and the Spanish Basque region examples of cooperative banking, one of the principal initial attractions for member-depositors and many other groups, such as the church, was the fact that the cooperative bank would explicitly focus on long term job creation in the locality (Bateman 2007). Local people and institutions were very concerned to become involved and to see that the new cooperative bank would become a success. But once established the banks became subject to overall democratic management by the member-savers alone.
Second, there is the related issue of the initial capitalisation. Rather than wait for savings deposits to rise to acceptable amounts, it is often the case that such cooperatives are ‘seeded’ by outside bodies, especially the state. In Finland, as MacIntyre (2003) reports, after 1945 the government used state funds to immediately recapitalise the main cooperative bank after World War II in order to promote trust and to achieve scale as quickly as possible. The resulting lending programmes, especially involving cooperative enterprises, quickly began to transform a quasi-Soviet satellite economy into one of Europe’s most successful industrial economies. Similar initial funding may be required in some of South Africa’s poorest communities if their initial poverty is not to become a permanent barrier to an escape from that poverty through SME development.

Third, there is the issue of locating and hiring the right skilled individuals to work in the cooperative bank on promoting local enterprise development. In many previous experiences, notably in Mondragon in Spain and in northern Italy, it was a passion to develop one’s own ethnic/political community that drove forward highly-skilled yet lowly paid individuals to excel in their job. It might be useful in the South African context, therefore, to develop various subsidy schemes that can attract and retain a number of skilled enterprise development professionals, even if only for mentoring purposes, alongside the regular account managers.

Overall, the cooperative banking structure represents for South African communities not just a potential source of local capital mobilisation for working capital needs in local enterprises and a way of efficiently intermediating these valuable savings into the very best SME projects, but also a way of promoting and underpinning the important social values associated with cooperation – solidarity, equality, trust, reciprocity, social justice and mutual support.

5.3 Hybrid local financial institutions

An important variant on the above cooperative bank/financial cooperative arrangement is a financial institution jointly owned by the large company and the collective of suppliers. This type of arrangement is historically popular in agricultural communities, where a large processor takes the initiative with a view to helping its farmer suppliers.

A surprisingly large number of examples of such financial structures already exist in South Africa (though many were carried over from the apartheid era and were mechanisms to ensure white domination). One good recent example is that of Akwanzi Agricultural Finance (AAF) which is located in Mpumalanga Province. AAF is a joint venture between TSB, a sugar processing company in Mpumalanga Province, and 900 farmers who provide the raw material to TSB and who have organised themselves into a cooperative. The rationale for AAF derived from the fact that small-scale farmers producing sugar cane simply could not usefully use the financial support offered by local commercial banks and microcredit institutions. Both these sets of financial institutions were far more interested in providing highly profitable unsecured consumer loans. An alternative was therefore sought. AAF was founded on an initial capital base provided by each of the local sugar cane farmers putting a little cash into the project, which was then matched with an interest-free loan from TSB. Along with subsequent injections of cash to match the growing numbers of successful farmers, this initiative created a farmer-controlled cooperative that could provide needed low interest long-term loans to its farmer-members secured on the output of their farm.

As of mid-2010 AAF had nearly 900 members and was growing. TSB reported that it greatly benefitted from the security of its supplier base, as well as from the higher specific investments made by its supplier farmers, who are all able to operate using the latest production and harvesting equipment and so could meet important quality controls. The farmer-members of AAF benefit from the supply of low cost finance that allows them to realise a greater return from farming, and also to invest in sustainably expanding and diversifying their operations to meet new demands and market opportunities provided by TSB and other customers (Bateman 2010b).

In South Africa there is much scope to promote these hybrid local financial institutions in the agricultural sector, as well as in other industry-based supply chains involving larger numbers of small subcontractors, such
as motor vehicles and the FTI industry noted earlier. The security provided by the contract is an important aspect in minimising risk and transactions costs (screening, administration) while the in-house knowledge of all parties to the programme ensures that the financial package can be designed to ‘fit’ with the end user’s requirements as much as possible.

5.4 Dedicated local funds to finance local content agreements and public contracts

In the EU countries and in the United States, the use of loan-fund backed public procurement policies to stimulate a manufacturing led SME sector is a well-established intervention. Partly it is designed to support the small business sector in preference to larger companies, which are seen as less efficient job-generators and less conducive to the formation of sustainable local business communities. There is also a more nuanced ‘developmental’ approach to public procurement, which is to preferentially help a small business in the difficult first few years of its life by awarding government contracts on preferential terms and conditions. Because the start-up period is a difficult one for most small businesses, the idea is to offer some guaranteed demand to help the business as it attempts to perfect its product, builds scale, trains its workforce, and so on. After the small business reaches a satisfactory level of maturity, the idea then is to disengage from providing preferential contracts and to encourage the business to compete on normal market terms.

Perhaps the best example here is that of Japan’s national and local governments, which have been extremely successful in carefully using state loan funds attached to public contracts to help potentially high-growth and innovative technology-based SMEs get established and sustainably expand. One of the most notable successes was in the case of industrial robotics, a global market which the Japanese small business sector effectively came to dominate (Porter 1990).

In South Africa, public purchasing contracts have also been used to support a new raft of businesses, many black-owned as part of the Black Economic Empowerment (BEE) initiative. However, it is widely accepted that many of these small businesses have been supported purely because of political motives and actually have very little potential to reach viability outside of the flow of government financial support. The rise of businesses unable to survive outside of government tender support has given rise to the phenomenon adversely referred to as the ‘tender-oacity’ and ‘tenderpreneurs’. This has naturally discredited the entire concept of public procurement support being used as an economic development instrument. Nonetheless, the use of public procurement policy to leverage developmental impacts is an accepted policy in most developed countries. However, in the South African and Mpumalanga context, this policy intervention has unfortunately become linked to crude political patronage and simple corruption.

A more efficient system of financial support for public procurement-led SME development programmes in South Africa would require highly qualified and politically independent management. In addition, equity stakes in the business would be desirable in order to recoup for the public at least some of the immense value represented by a stable public contract.

5.5 Encouraging loan consortia among suitable SMEs

The Italian example shows the long-term benefit of groups of SMEs forming consortia to bid for lower cost funding that would be applicable to individual SMEs. The concept has been highly attractive in the past because it has reduced risk on the part of the financial institutions as well as monitoring costs, thanks to joint liability between the SMEs, while also reducing opportunistic behaviour on the part of participating SMEs. It is no surprise that in Italy’s FTI sector, the use of consortia was extensive, providing members within each consortium of a valuable supply of long-term, low cost capital for machinery purchase and working capital costs.
In South Africa, forming groups of industrial SMEs with a view to them collectively obtaining capital on better terms largely depends on the commercial banking system’s willingness to participate. Elsewhere, above all in Italy, it was the local commercial banks’ willingness to help develop the local economy that encouraged them to work with groups of SMEs in this way. Such an ambience is perhaps somewhat less developed in today’s South Africa, though it cannot be ruled out with regard to the more socially-oriented banks in the country. This suggests that such consortia might work best alongside municipality or cooperative banks, as a further way of ensuring that these institutions are able to positively impact in the local community.

5.6 Build-Operate-Transfer (BOT) enterprise financing programmes

One of the most important barriers to pro-poor SME development is the problem of ‘initial conditions’. This problem emerges because the poor by definition cannot afford to invest in the most profitable parts of the supply chain, which means they are forever condemned to operating in the least valuable parts, and so must allow richer members of the community – individuals and companies – to exploit the most valuable parts of the supply chain. This effectively entrenches local inequality and exclusion through unequal supply chains based on capital input.

One way around this problem is for public bodies to provide the poorest members of the community with sufficient grant or loan finance to integrate into the most valuable parts of any supply chain the returns from which they can use to develop the community. For example, in agricultural supply chains, it is well-known that the most valuable/profitable segments of the chain are in processing and retailing, which the poor generally do not enter because of simple capital constraints. If, however, these most valuable sections of the supply chain are purchased by an external body and later on sold back to the poorest participants, a major SME development breakthrough is possible: the poorest participants will end up controlling the most valuable sections and can ensure that value is passed down the chain to those most in need for personal and investment purposes.

In Ecuador, for instance, regional governments have provided significant resources to traditionally poor farming communities in order for them to integrate into the most valuable/profitable parts of the agricultural supply chain – the processing and retailing parts. Rather than consigning the poor to the mere production phase and allowing wealthier Ecuadorian individuals and private businesses (including foreign multinationals) to monopolise the higher value added sections of the supply chain, which is often the direct motive of many international development community programmes aiming at ‘strengthening the supply chain’; the idea behind these interventions is to encourage the poor to collectively own the most valuable/profitable parts of the supply chain with a view to the value being channelled downwards into the poorest communities. With regional government providing up to $1 million to successfully establish a functioning processing plant, which was then sold off to the cooperative owned by the farmers, the regional government established an equitable and developmental supply chain (Bateman 2012).

In promoting equitable and sustainable enterprise development, this is one of the best ways possible. An initial lack of capital on the part of poor communities need not ‘lock in’ the poor to a permanently disadvantaged position but can, instead, be overcome thanks to capital investment by the wider community. Important capital assets can be built up using loan funding and then transferred over to ‘collectivities’ of the poor (cooperatives, associations, municipalities) and used by the poor to generate wealth. This is a direct way of supporting SME development, and also an important one since it overcomes the typical barriers associated with poverty and exclusion.

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7 The United States government’s USAID arm is probably the worst offender here, routinely promoting ‘more efficient supply chains’ that are actually all about helping large American companies and corporations to build a more efficient supplier network in order to maximise their own profits, rather than maximise development opportunities in the poorest communities.
5.7 Renewed emphasis on credit unions as support for consumption loans.

Finally, there is the ‘elephant in the room’ question in South Africa, which is what to do about the massive consumer debt overhang that exists today? South Africa’s massive individual debt overhang has largely arisen as result of the actions of for-profit microcredit institutions. While for many years, the local informal moneylenders (mashonisa) would ply their trade in South Africa, the social legitimisation of the microcredit model encouraged formal financial institutions to engage with the very poorest communities in pursuit of profit. However, maximising profits involved, among other things, the need to bring in as many clients as possible in order to cut unit costs. This emphasised rapid growth no matter if this was, or was not, in the best interests of the community itself. The worst case of expansion involved the deliberate over-indebting of the mining communities around Rustenburg in the North West Province platinum mining belt, the end result of which was to exacerbate the conditions under which the miners lived to the extent that they felt forced to go on strike, with disastrous consequences at the Marikana mine on August 16th 2012, when 34 unarmed miners were shot dead by local police (Bateman 2013).

Credit unions, on the other hand, have no internal profit-maximisation incentive to stimulate such lending. As saver-member organisations, a credit union exists to provide services for current members, which include microloans but also other services, and where there is no in-built profit-driven impetus to expand as much as possible. Like their informal cousins, ROSCAs (Rotating Savings and Credit Associations), formal credit unions tend to attract much more support in the community because they are owned by that community. Robust regulations will be required, however, in order to ensure that there is a minimum of mismanagement and corruption.

6. CONCLUSION

This paper has centrally argued that the local financial systems that have evolved in recent times under neoliberal policy regimes, including in South Africa, have proven to be entirely unsuitable to a manufacturing led SME development trajectory. Importantly, historical experience, also including from South Africa itself, provides a wealth of examples of highly effective non-neoliberal local financial systems that are intimately associated with sustainable industry and agro-industry-based SME development progress. These insights were then set against the understanding that the local financial system typical of most communities in South Africa today represents one of the most important barriers to the success of a manufacturing led SME sector. Change is therefore urgent.

Using insights from the FTI sector in South Africa, the conclusion of this paper is that urgent steps must be taken in South Africa to reconfigure the local financial system in a non-neoliberal direction. A number of alternative non-neoliberal financial institutions were therefore outlined. In particular, it was emphasised that economic history time and again shows the developmental power of community-based (owned and controlled) financial institutions. While not without problems, community-based financial institutions provide a far better chance of establishing an effective local financial system in post-apartheid/post-neoliberal/post-global financial crisis South Africa.
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AN ASSESSMENT OF OPPORTUNITIES FOR LOCAL PRODUCTION OF CONSTRUCTION AND BUILDING MATERIALS USING THE SOUTH AFRICAN PUBLIC HOUSING DELIVERY PROGRAMME AS A PROCUREMENT LEVER

Tebogo Makube (PhD)

Abstract

The objective of this study is to review challenges and opportunities in the delivery of the public housing programme. The focus is on assessing opportunities for local production and manufacturing of construction materials. This is important for lowering the cost of delivering infrastructure, increasing access to houses, job creation and diversification of enterprise and supplier development in the sector. Thus public expenditure and procurement should be considered as strategic levers for industrial development. The New Growth Path (NGP) and the Industrial Policy Action Plan (IPAP) make a strong point that much public procurement is conducted on an ad hoc rather than a strategic basis and does not deliver adequately on either value-for-money or key industrial policy objectives. This is because the procurement of the public housing programme across the country is not directly linked to industrial policy imperatives, especially in the areas of local production and enterprise development in the supply of construction materials.

This study contends that the public housing programme must be linked to industrial policy objectives and that the government should prioritise the designation of construction materials and products for local production. This will require an emphasis on local procurement, especially in the sourcing of materials for the construction and delivering of low-cost houses funded by the government. Emphasis should not only be based on the final delivery of houses but leveraging public expenditure to expand and diversify suppliers of construction and building materials. Local production, supplier and enterprise development should be mandatory in the request for proposals (RFPs) for public housing delivery.
1. INTRODUCTION

The objective of this study is to review challenges and opportunities in the delivery of the public housing programme. The focus is on assessing opportunities for local production and manufacturing of construction materials. This is important for lowering the cost of delivering infrastructure, increasing access to houses, job creation and diversification of enterprise and supplier development in the sector. Thus public expenditure and procurement should be considered as strategic levers for industrial development.

Generally, well planned and targeted public housing programmes provide the foundation for sustainable livelihoods by supporting broad community development goals, including housing, economic development, infrastructure and social services (Mapiravana & Ampofo-Anti 2011; van Wyk et al 2012). However, South Africa is facing a serious shortage of housing, despite the fact that the government has been delivering houses for the poor through the housing subsidy scheme since 1994. According to the National Treasury (2011), through the subsidised housing programme government has delivered more than 2.6 million houses; however, the housing backlog remains on the increase as reflected in Table 1, which shows the estimated low-cost housing backlog from 1996 to 2011.

<table>
<thead>
<tr>
<th>Year</th>
<th>Backlog</th>
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<tbody>
<tr>
<td>1996</td>
<td>1.5 million houses</td>
</tr>
<tr>
<td>2001</td>
<td>1.8 million houses</td>
</tr>
<tr>
<td>2011</td>
<td>2.1 million houses</td>
</tr>
</tbody>
</table>

Source: Department of Housing, 1994 and Department of Human Settlements, 2011.

The Financial and Fiscal Commission (FFC) (2011) submits that it is increasingly accepted that the public housing delivery system has not managed to meet the challenges of scale, affordability and sustainability. The challenge facing the public housing programme is not simply to provide a physical structure but sustainable neighbourhoods that can contribute to urban economic and social life (National Treasury 2009, Financial & Fiscal Commission 2011). Other challenges relate not only to the enormous size of the housing backlog, the diverse needs of the homeless and others who are currently inadequately housed but also to the housing environment, which has many complex facets. Poverty, unemployment, economic stagnation and negative behaviour, together with financial and capacity constraints make the task for housing delivery even more daunting (City of Cape Town 2009).

It can be added that South Africa, like many developing countries, is faced with challenges of rapid urbanisation resulting from migration both rural and from neighbouring countries. This has an impact on the growth of cities and demand for urban land, housing and public infrastructure. An estimated 2 million households live in informal and inadequate housing. The public housing sector is facing a number of other challenges, such as households being on housing waiting lists for 10 years or longer, leading to considerable frustration (Financial & Fiscal Commission 2011). The FFC also notes that over 1.3 million households who do not qualify for a housing subsidy live in inadequate, overcrowded and/or informal housing as they are unable to afford current house costs. Urban sprawl and low densities are cited as contributors to unproductive and inefficient cities as poor households continue to be marginalised by distance and transportation costs and the lack of agglomeration in many urban centres (Turok & Parnell 2009). These challenges undermine economic development and efficiency, and require a review of the delivery of housing and its acceleration. In the delivery of houses, public procurement and expenditure on low-cost housing programmes have a huge potential to propel economic development through local production of building materials.
2. PROBLEM STATEMENT

The Department of Trade & Industry (2013) in the 2013/14 – 2015/16 Industrial Policy Action Plan (IPAP) asserts that much public procurement is conducted on an ad hoc rather than a strategic basis and does not deliver adequately on either value-for-money or key industrial policy objectives. The procurement of the public housing programme across the country is not directly linked to industrial policy imperatives in the areas of local production and enterprise development, especially in the supply of construction materials. The decision to design and construct new homes has material-intensive implications that are economically significant. Human settlements require the use of a wide range of resources, including land, money, building materials, manpower, energy and water. As a general principle, it is essential that resources be used as efficiently as possible and the cost of construction minimised (Mapiravana & Ampofo-Anti 2011).

Eliasson et al (2009) postulates that public housing programmes have common linkages with industrial policy in three particular dimensions: (i) the financial capacity to engage in very large and advanced public procurement; (ii) in creating a larger local production capture area for economic and technological spillovers; and (iii) in introducing an opportunity to shift industrial policy focus to more effective product procurement programmes (Eliasson et al 2009: 2). In South Africa, the public sector’s demand for building materials is huge, driven by the government infrastructure programme in energy, roads, rail, education, health and human settlements. This presents an opportunity to assess opportunities for industrial development in the South African infrastructure programme, in particular the delivery of the public housing programme. Local production of building materials can help to stimulate industrial development, which will assist in reducing building and life cycle costs and minimise the lead time for building delivery in South Africa; this will positively impact on the access to affordable housing, all other things being equal.

3. OBJECTIVE OF THE STUDY

The main objective of the study is to consider some of the procurement options available to the government to deliver low cost housing developments in South Africa. This study also assesses the feasibility of designating building materials for local production in the public housing development programme, provides an analysis of the building materials industrial structure, and identifies trends for imports and exports. The study provides recommendations for interventions on certain building materials, and calls for an expansion of opportunities for local production, enterprise and supplier development in the sector. This will have an impact in accelerating industrial development and thereby facilitate access to families who are in urgent need of shelter.

4. METHODOLOGY

This study reviewed literature and official government policies on the delivery of public housing programmes; it undertook desktop research, especially the review of financial and economic data to explore trends in the public housing delivery programme and the associated construction materials sector. Stakeholder views were also analysed and were helpful to make an informed view of the challenges and opportunities facing the public housing sector. The analysis was used to make recommendations for the designation and localisation of construction materials used in the public housing programme in South Africa.
5. GOVERNANCE AND INSTITUTIONAL FRAMEWORK FOR HOUSING DELIVERY IN SOUTH AFRICA

In South Africa, the right to housing is enshrined in Section 26 of the Bill of Rights, which states that “…everyone has the right to have access to adequate housing” and that “…the state must take reasonable legislative and other measures, within its available resources to achieve the progressive realization of this right” (Constitution of the Republic of South Africa 1996).

As a result, government has intensified its programme on housing delivery to ensure that it meets its commitment to progressively realise the right of all citizens to safe and affordable housing.

The Constitution, in schedules 4A and 5A, assigns housing as a concurrent function of national and provincial government. It also provides that where the housing function can best be administered locally it can, by agreement, be assigned or delegated to a municipality provided that the municipality has the capacity and resources to perform the function. In the current constitutional dispensation in South Africa, housing delivery is not the direct responsibility of municipalities but they can be accredited to deliver this function based on their capacity. However, municipalities deliver other important services and servitudes such as development planning, water, electricity and roads. The Constitution also places a significant substantive constraint on all governments by requiring resources to be put towards the progressive realisation of socio-economic rights listed in the Bill of Rights. Social and economic rights such as the right to access to housing have significant policy and fiscal implications. However, these rights do not place an absolute, immediate obligation on the state. Instead, the Constitution states that, “…the state must take reasonable legislative and other measures, within its available resources, to achieve the progressive realisation of each of these rights” (see S27(2) and S26(2) of the Constitution of the Republic of South Africa).

Besides the Constitution, the Housing Act (Act No. 107 of 1997) obliges all spheres of government to give priority to the needs of the poor in relation to housing development. It outlines the responsibilities of the various spheres of government in relation to housing delivery, including providing for municipalities to be developers in the housing development process. Government is expected to mainstream the culture of fairness and equality in all aspects of service delivery and planning, as enshrined in the Batho Pele (people first) principles of public service. This includes the equitable allocation of public finances, provision of houses, promotion of sustainable livelihoods, and transparency in the application of procurement policies. The next section discusses supply- and demand-side issues affecting housing delivery in South Africa.

6. SUPPLY- AND DEMAND-SIDE ISSUES AFFECTING PUBLIC HOUSING DELIVERY IN SOUTH AFRICA

The public housing delivery programme is influenced by both supply- and demand-side issues. On the supply side, various government policies have been formulated towards overcoming the huge shortage through several public housing delivery reform programmes through delivering Reconstruction and Development Programme (RDP) housing; Breaking New Ground (BNG), a comprehensive plan for the development of sustainable human settlements; upgrading informal settlements; and the Finance-Linked Individual Subsidy Programme (FLISP) aimed at subsidising mortgage interest rates (Financial & Fiscal Commission 2013). Despite these efforts, housing demand continues to grow as people move to cities and urban centres in search of opportunity and change (Rust 2006).
6.1 The National Norms and Standards for the Construction of Stand Alone Residential Dwellings (2007)

In 1999 the then Minister of Housing introduced the National Norms and Standards for the Construction of Stand Alone Residential Dwellings in terms of section 3(2)(a) of the Housing Act (Act No. 107 of 1997). The norms and standards provide the minimum technical specifications, including environmentally efficient design proposals. These were revised on 1 April 2007 in respect of Permanent Residential Structures (National Norms and Standards) which are contained in the 2009 National Housing Code. All free-standing houses constructed through the application of the National Housing Programmes must as a minimum comply with the norms and standards. As stipulated, each house must have:

- A minimum gross floor area of 40m²;
- Two bedrooms;
- A separate bathroom with a toilet, a shower and a hand basin;
- A combined living area and kitchen with wash basin; and
- Ready board electrical installation, if electricity is available in the project area.

In general, all residential properties established through the national housing programme must at least comply with the following levels of services, as per the National Norms and Standards:

<table>
<thead>
<tr>
<th>Type of service</th>
<th>Minimum level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>Single standpipe per stand (metered)</td>
</tr>
<tr>
<td>Sanitation</td>
<td>Ventilated Improved Pit (VIP) latrine or alternative system agreed to between the community, the municipality and the Member of the Executive Council (MEC)</td>
</tr>
<tr>
<td>Roads</td>
<td>Graded or gravel paved road access to each stand (this does not necessarily require a vehicle access to each property)</td>
</tr>
<tr>
<td>Storm water</td>
<td>Lined open channels</td>
</tr>
<tr>
<td>Street lighting</td>
<td>Highmast security lighting for residential purposes where this is feasible and practical, on condition that such street lighting is not funded from the MIG initiative or from other sources</td>
</tr>
</tbody>
</table>

In addition to the Ministerial Norms and Standards, all houses must be registered with the National Home Builders Registration Council (NHBRC) and must comply with the building standards as stipulated by the NHBRC. All construction is furthermore subject to building plan approval by municipalities and building standards imposed by municipal by-laws.

Since the introduction of the National Building Regulations (NBRs) in 1985, municipalities have applied these functional requirements when checking building plans that have been submitted for approval (NHBRC 2011). When an innovative product being proposed falls outside the experience of the municipality’s building control officials, an assurance of the fitness for purpose of the product will be required. In terms of the NBRs this assurance can be given by submission of an applicable report issued by the Council for Scientific and Industrial Research (CSIR), which is a statutory organisation for technology transfer; or by the South African Bureau of Standards (SABS); or by submission of a current certificate issued by Agrément South Africa. To date Agrément South Africa has issued 430 certificates, of which approximately 75 per cent have been awarded to innovative building systems. Examples of areas where Agrément Certificates have been awarded and remain valid are baths, bathroom and toilet units; bridge deck joints; ceilings and roofing; concrete additives; damp-proofing; insulation; non-traditional soil stabiliser and thin bituminous surfacing systems; plumbing; windows; storage tanks; sanitation; wall coatings; walling and building systems; waterproofing.
Whereas norms and standards provide essential requirements for the design and construction of houses, they do not cover all construction materials and products used in the building and delivery of houses. This is an area that must be looked into in the harmonisation of standards for construction materials, and not only in the housing sector. Harmonised construction material standards have the effect of creating a more uniform level of construction methods and safety. The European Commission created a set of standardised European design norms that provide a common approach to structural design across the European Union. The pan-European harmonised rules on structural design also contribute to the establishment and functioning of the internal market for construction products and engineering services, by eliminating potential barriers to trade that exist when countries have different standards (Grech 2013). In South Africa, harmonisation of standards and better coordination in the buying of both supplies and contractors services can have a positive effect on the government’s savings.

6.2 Public procurement policy framework and legislation in South Africa

In South Africa, preferential public procurement policy is identified as an instrument to redress the social-economic imbalances brought about by past racial discrimination. A number of criteria are identified for promotion through public procurement, including:

- a. the development of small-and-medium and micro enterprises;
- b. the promotion of historically disadvantaged individuals, women and physically challenged people;
- c. the creation of new jobs;
- d. the promotion of local enterprises in specific provinces; and
- e. the promotion of local production (Green Paper on Public Sector Procurement Reform in South Africa, 1997).

Watermeyer (2003) argues that public procurement is the means by which the country's policy objectives are implemented. Its effectiveness and efficiency through the purchase of goods and services is affected by a number of factors including legislation, regulations, policies, institutional arrangements, management, transparency and accountability. Section 217 of the Constitution sets out the basis on which organs of state should enter into contracts for goods and services. Apart from the Constitution, procurement policy is also regulated by the Preferential Procurement Policy Framework Act (PPPFA) (Act No.5 of 2000) and its amended regulations of 2001 and 2011. Public procurement is also central to good public financial management and public resources allocation in line with Section 217 of the Constitution, the Public Finance Management Act (PFMA) (Act No. 1 of 1999) and the Municipal Finance Management Act (MFMA) (Act No. 6 of 2003). Public procurement also accounts for a sizable part of economies in both developed and developing countries, where generally it contributes between 15 to 25 per cent to the gross domestic product (GDP), thus representing significant amounts of public expenditure (Taylor & Yülek 2012). This shows that the government possesses the necessary purchasing power to leverage procurement in support of broader economic development goals.

Public procurement is seen by the government as one of the key industrial levers in the New Growth Path (NGP) and Industrial Policy Action Plan (IPAP). The revised PPPFA regulations which came into effect on 7 December 2011 empower the Department of Trade and Industry (the dti) to designate industries, sectors and sub-sectors for local production at a specified level of local content. This is only applicable in the public sector’s procurement system and cannot be legislated in the private sector due to limitations imposed by the World Trade Organisation’s (WTO) rules on Trade Related Investment Measures (TRIMS). It must be noted that South Africa is not signatory to the WTO’s Agreement on Government Procurement (GPA) and can therefore designate products for local procurement and production in the public sector. Given its economic significance, public procurement has the potential to influence the economy in terms of production and consumption on a
large scale. Construction materials play an important role in infrastructure delivery and it is important that the government considers designating these materials to leverage its expenditure in the sector; this should also include diversified supplier and enterprise development programmes.

In examining difficulties encountered in implementing the preferential procurement policy in conjunction with the low-cost housing programme, Magoro and Brynard (2010) contends that the Provincial Departments of Local Government and Housing in South Africa are largely incompetent when it comes to implementing the preferential procurement policy. In spite of budget increases for the acceleration of housing delivery, the South African government continues to face an immense housing backlog and this can be attributed largely to incompetent implementation of the procurement policy. They further argue that the murky method(s) of tender awards and the dismal state of monitoring and evaluation mechanisms in place to oversee the progress of construction work further exacerbates the problem (Magoro & Brynard 2010). It can be added that low-cost housing delivery challenges are also as a result of a myriad of complex inter-related issues including inadequate supply of suitable land close to economic opportunities, misaligned intergovernmental exclusive and concurrent functions, costs associated with the provision of bulk infrastructure, and a mismatch between affordability tests, targeting of beneficiaries and allocation of houses. The implementation of the low-cost housing programme in South Africa and associated challenges are reviewed further in the following section.

6.3 Low-cost housing delivery process in South Africa

The conventional construction for houses in the South African context starts by acquiring land, followed by the assessment of technical site constraints (slope analysis, bulk services assessment, preliminary geotechnical and environmental assessments), bulk infrastructure investments, house construction, hand-over and maintenance (see Figure 1) (Construction Industry Development Board 2011).

![FIGURE 1: HOUSING DELIVERY PROCESS](image)

**Source:** Department of Human Settlements, 2011

Suitable land and financial limitations are some of the challenges impacting on the delivery and equitable allocation of social housing as envisaged in the constitution. As such, low cost housing tends to be located at the periphery of economic opportunities and this increases the transaction cost of beneficiaries. Poorly located housing results in the deepening of already high levels of inequality and inefficiency in South African towns and cities. This may impose long term costs on households and growing pressure on the public sector to fund access to basic infrastructure and transport services (National Treasury 2009).

There are fiscal challenges with providing fully subsidised housing in South Africa. The Financial and Fiscal Commission (FFC) (2011) notes that high levels of unemployment means that 60 per cent of households are potentially eligible for fully subsidised houses. The FFC (2011) also contends that the current subsidy is
perceived as discouraging complementary investment and participation by the private sector and households, especially at the lower end of the market. This has resulted in an increasing burden and dependence on the government for housing (Rust, 2006). In spite of the challenges, the 2010 General Household Survey notes that there has been continued growth in the ownership of dwellings, rising from 53.1 per cent in 2002 to 58.1 per cent in 2010 (see Figure 2). Simultaneously, the percentage of the households who were renting decreased from 22.5 per cent in 2007 to 20.6 per cent in 2010, while the percentage of dwellings that were partially owned declined rapidly to 10.9 per cent. This shows that there has been an inverse relationship between fully owned dwellings and renting. As ownership increases, renting decreases. The percentage of households whose tenure status was classified as ‘other’ (e.g. house/flat/room in back yard, informal/squatter settlement, hostel, tent, caravan, boat) decreased slightly from 11.8 per cent in 2002 to 10.4 per cent in 2010 (Stats SA 2011: 20).

**FIGURE 2: PERCENTAGE OF HOUSEHOLDS LIVING IN FORMAL DWELLINGS**

<table>
<thead>
<tr>
<th>Year</th>
<th>Fully Owned</th>
<th>Partially Owned</th>
<th>Renting</th>
<th>Other</th>
</tr>
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<tbody>
<tr>
<td>2002</td>
<td></td>
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<td>2003</td>
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<td>2010</td>
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*Source: Stats SA, 2010 General Household Survey*

The survey also reports that the percentage of households living in informal dwellings has remained unchanged at 13 per cent between 2002 and 2010, as reflected in Figure 3. While the proportion of informal dwellings declined in provinces such as KwaZulu-Natal, Limpopo and Mpumalanga, increases were observed in Gauteng, North West and Western Cape. The provinces with the highest percentage of informal dwellings in 2010 were Gauteng (21.5%), North West (18.8%), Western Cape (17.1%) and Free State (13.3%) (Stats SA 2011: 20).
The National Treasury notes that nearly 70 per cent of the housing backlog is in urban areas. While demand is increasing, the pace of delivery has declined, partly due to higher building and land costs. The persistence of large informal settlements has necessitated a shift towards developing serviced sites, security of tenure and affordable rental housing. To support this outcome, R50.5 billion has been allocated for low-income housing and upgrading of informal settlements in secondary cities, as well as R27 billion for upgrading informal settlements in large cities in the 2012 Medium Term Expenditure Framework (MTEF) (National Treasury, 2012).

The 2010 General Household Survey also reports that 18.9 per cent of South African households were living in an “RDP” or state-subsidised dwelling while a further 13 per cent had at least one household member on a demand database/waiting list for state-subsidised housing. A larger percentage of female-headed households received subsidies compared to male-headed households (see Figure 4).
The survey also established that across the country, 17.2 per cent of households felt that the walls of their dwellings were weak or very weak, whilst 17.9 per cent felt that the roof was weak or very weak. There was considerable variation between provinces in the perceptions about housing quality. Most complaints were noted in the Eastern Cape, Northern Cape and Western Cape.

**FIGURE 5: PERCENTAGE OF HOUSEHOLD COMPLAINING ABOUT THE QUALITY OF SUBSIDISED (’RDP’) HOUSES**

![Graph showing percentage of households complaining about the quality of subsidised RDP houses]

**Source:** Stats SA, 2010 General Household Survey

The National Economic Development and Labour Council (Nedlac 2004) notes that there is a trend towards the use of corrugated metal roofing in low cost ‘RDP’ housing.

“…The reason for this is that this roofing material requires a minimum of support (virtually no wooden trusses) and, therefore, can cost as little as one-third of the cost of using fibre cement sheeting and concrete tiles – both of which require substantial support structures” (Nedlac 2004:3).

Fibre cement sheeting generally represents the roofing material of choice as it the cheapest alternative. The Construction Industry Development Board (CIDB) also notes that while South Africa has a well-developed set of national standards which enable manufacturers and contractors to provide consumers with high quality products, concerns have been raised in the industry about the increasing non-compliance of materials and products with national standards:

- Many building projects are poorly specified, and artisans and foremen are not accredited in terms of their performance in achieving the necessary standards
- Many of the current specifications are perceived to present a barrier to entry to small scale entrepreneurs and exclude their participation in particular markets, and a limited amount of clients are reportedly not requiring materials to comply with SANS standards
- There is a lack of capacity amongst building inspectors to evaluate compliance requirements (Construction Industry Development Board 2011:4).

The abovementioned challenges lead to owners of publicly provided ‘RDP’ houses being dissatisfied with the end product. Partly these challenges are attributed to the procurement system. Magoro and Brynard (2010) argues that in certain instances housing construction tenders are awarded to companies that, in fact, consist of nothing more than a company registration certificate:
“...These tenderers recruit other companies that do not possess the requisite expertise as subcontractors to do the actual construction

(2010: 11).

Rogerson (2004) argues that the practices of contractors who attempt to secure a tender without the necessary expertise creates a high-risk environment for clients and government in terms of structural defects and life cycle costs. As a result, this undermines the use of the preferential procurement policy as an instrument of socio-economic objectives, including poverty reduction (Magoro & Brynard 2010).

There is no doubt that South Africa faces a significant challenge in providing affordable, suitable accommodation to its citizens. To robustly deal with this challenge it is necessary to review the delivery of low-cost houses, which includes the empowerment of beneficiaries to play a role in building their houses, and the review of the procurement and funding models.

6.4 The funding of the low-cost housing delivery process in South Africa

In the 2012 Medium Term Expenditure Framework (MTEF) and as reflected in Figure 6, R1 billion was added to the integrated human settlements development grant (conditional fiscal transfer for human settlements) to provide for informal settlements upgrading, increasing the three-year baseline amount for the grant to R50.5 billion (National Treasury 2012).

FIGURE 6: BUDGET ALLOCATION FOR THE INTEGRATED HUMAN SETTLEMENTS DEVELOPMENT GRANT

<table>
<thead>
<tr>
<th>Financial year</th>
<th>Budget allocation (R’ million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011/12</td>
<td>15122</td>
</tr>
<tr>
<td>2012/13</td>
<td>15726</td>
</tr>
<tr>
<td>2013/14</td>
<td>16984</td>
</tr>
<tr>
<td>2014/15</td>
<td>17808</td>
</tr>
</tbody>
</table>

Source: National Treasury, 2012

National Treasury (2012) notes that in terms of housing expenditure in nominal terms, the integrated housing and human settlement development grant has disbursed approximately R60 billion between 1995 and July 2010. This has provided a total of 2.6 million housing opportunities, at a gross average cost of R18 850 per unit and an average annual delivery rate of 200 000 units a year.

Table 3 shows that human settlement expenditure increased from R12.4 billion in 2009/10 to R17.2 billion in 2011/12, representing an average annual increase of 18.5 per cent. In line with the rapid rate of urbanisation and demand for housing, the Eastern Cape, Gauteng, KwaZulu-Natal and the Western Cape were allocated more funding for human settlements relative to other provinces. However, the projected overall rate of expenditure growth declined between 2008/09-2011/1 compared to the previous period. A lack of capacity, among other factors, resulted in annual underspending of the grant.
## TABLE 3: INTEGRATED HUMAN SETTLEMENTS DEVELOPMENT GRANT EXPENDITURE, (2005/06-2011/12)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Cape</td>
<td>607</td>
<td>637</td>
<td>337</td>
<td>981</td>
<td>1 313</td>
<td>1 599</td>
<td>1 803</td>
</tr>
<tr>
<td>Free State</td>
<td>370</td>
<td>528</td>
<td>467</td>
<td>859</td>
<td>963</td>
<td>1 301</td>
<td>1 390</td>
</tr>
<tr>
<td>Gauteng</td>
<td>1 357</td>
<td>1 760</td>
<td>2 614</td>
<td>2 778</td>
<td>3 187</td>
<td>3 772</td>
<td>4 323</td>
</tr>
<tr>
<td>KwaZulu Natal</td>
<td>816</td>
<td>1 075</td>
<td>1 311</td>
<td>1 627</td>
<td>2 180</td>
<td>2 714</td>
<td>3 150</td>
</tr>
<tr>
<td>Limpopo</td>
<td>383</td>
<td>605</td>
<td>633</td>
<td>825</td>
<td>997</td>
<td>1 235</td>
<td>1 415</td>
</tr>
<tr>
<td>Mpumalanga</td>
<td>269</td>
<td>330</td>
<td>652</td>
<td>797</td>
<td>795</td>
<td>976</td>
<td>1 118</td>
</tr>
<tr>
<td>Northern Cape</td>
<td>103</td>
<td>105</td>
<td>231</td>
<td>219</td>
<td>325</td>
<td>273</td>
<td>313</td>
</tr>
<tr>
<td>North West</td>
<td>615</td>
<td>697</td>
<td>786</td>
<td>952</td>
<td>1 100</td>
<td>1 289</td>
<td>1 578</td>
</tr>
<tr>
<td>Western Cape</td>
<td>552</td>
<td>769</td>
<td>1 122</td>
<td>1 306</td>
<td>1 581</td>
<td>1 869</td>
<td>2 142</td>
</tr>
<tr>
<td>Total</td>
<td>5 072</td>
<td>6 506</td>
<td>8 153</td>
<td>10 344</td>
<td>12 441</td>
<td>15 028</td>
<td>17 222</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(%) growth (average annual)</th>
<th>2005/06 - 2008/09</th>
<th>2008/09 - 2011/12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Cape</td>
<td>174%</td>
<td>22.5%</td>
</tr>
<tr>
<td>Free State</td>
<td>32.4%</td>
<td>17.1%</td>
</tr>
<tr>
<td>Gauteng</td>
<td>27.0%</td>
<td>15.9%</td>
</tr>
<tr>
<td>KwaZulu Natal</td>
<td>25.9%</td>
<td>24.6%</td>
</tr>
<tr>
<td>Limpopo</td>
<td>29.1%</td>
<td>19.7%</td>
</tr>
<tr>
<td>Mpumalanga</td>
<td>43.6%</td>
<td>11.9%</td>
</tr>
<tr>
<td>Northern Cape</td>
<td>28.6%</td>
<td>12.6%</td>
</tr>
<tr>
<td>North West</td>
<td>15.7%</td>
<td>18.3%</td>
</tr>
<tr>
<td>Western Cape</td>
<td>33.3%</td>
<td>17.9%</td>
</tr>
<tr>
<td>Total</td>
<td>26.8%</td>
<td>18.5%</td>
</tr>
</tbody>
</table>

While the national housing programme has been delivering approximately 200 000 fully subsidised housing units per annum, the current government programme does not adequately address the growing need and demand, and the fiscus is under pressure to provide more budget allocations.

### 7. THE ROLE OF CONSTRUCTION MATERIALS IN THE PUBLIC HOUSING PROGRAMME

In analysing the South African construction industry sector, it may be deduced that the sector has experienced constant growth in the last decade, possibly explained by the boom in residential and commercial property development. It is estimated that some 200 000 people are employed in the materials manufacturing sector, with an average number of employees of between 200 and 500 persons per organisation (Construction Industry Development Board 2011). In 2008, the construction of new residential buildings in South Africa accounted for about 25 per cent of the total national building and construction budget of R158.6 billion. From April 2007 to March 2010, the South African public sector allocated about 10 per cent of its annual infrastructure budget (R10 billion per annum) towards housing development (Construction Industry Development Board 2011). When the input costs of home building are analysed, materials typically account for 60 per cent of the costs while labour accounts for the remaining 40 per cent (Mapiravana & Ampofo-Anti 2011). The Construction Industry Development Board (2011) estimates that of the current building and construction investment of R158.6 billion per annum, materials accounts for R95 billion as reflected in Figure 7.
Building materials

Analysis of the building materials market situation in South Africa identified the major building material cost drivers as cement, concrete and steel. Figure 8 shows cost indicators for an affordable low-cost house construction. Bulk infrastructure comprises 23 per cent of the cost, followed by profit margins (20%), internal finishes and structural frame (16% each). All other costs are less than 10 per cent each (National Treasury 2011). The share of the profit margin is relatively high as the industry practice for project management is between 8 per cent and 15 per cent.

Source: National Treasury, 2011
The building of a house comprises concrete, clay brick or block masonry walls with timber roof construction, metal or fibre-cement roof sheeting, or concrete or pressed metal roof tiles. Such conventional construction is largely covered by the deemed-to-satisfy rules accompanying the building regulations (Agrément South Africa 2011).

As already stated, key building materials in the South African residential building sector are cement and steel. The Construction Industry Development Board (2011) reports that in 2008, the split in cement demand between building and construction works was 65 per cent to 35 per cent. In the building sector, the split between residential and non-residential buildings was 68 per cent to 32 per cent. Table 4 ranks the market share of the major building materials in South Africa.

<table>
<thead>
<tr>
<th>Material group</th>
<th>Rand market share (%)</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cement and reinforced concrete</td>
<td>16.5</td>
<td>1</td>
</tr>
<tr>
<td>Reinforcing steel and sections</td>
<td>11.1</td>
<td>2</td>
</tr>
<tr>
<td>Walling</td>
<td>10.6</td>
<td>3</td>
</tr>
<tr>
<td>Flooring</td>
<td>9.3</td>
<td>4</td>
</tr>
<tr>
<td>Roofing and vertical cladding</td>
<td>8.3</td>
<td>5</td>
</tr>
<tr>
<td>Aggregate and sand</td>
<td>6.7</td>
<td>6</td>
</tr>
<tr>
<td>Decorative paint</td>
<td>5.7</td>
<td>7</td>
</tr>
<tr>
<td>Doors and frames</td>
<td>5.2</td>
<td>8</td>
</tr>
<tr>
<td>Plumbing pipes and fittings</td>
<td>4.9</td>
<td>9</td>
</tr>
<tr>
<td>Particle board and MDF*</td>
<td>4.3</td>
<td>10</td>
</tr>
<tr>
<td>Roof trusses</td>
<td>4.1</td>
<td>11</td>
</tr>
<tr>
<td>Glass and mirrors</td>
<td>2.7</td>
<td>12</td>
</tr>
<tr>
<td>Sanware</td>
<td>2.1</td>
<td>13</td>
</tr>
<tr>
<td>Taps and fittings</td>
<td>1.7</td>
<td>14</td>
</tr>
<tr>
<td>Ceramic wall tiles</td>
<td>1.7</td>
<td>15</td>
</tr>
<tr>
<td>Ceilings and partitioning</td>
<td>1.2</td>
<td>16</td>
</tr>
<tr>
<td>Geysers</td>
<td>1.1</td>
<td>17</td>
</tr>
<tr>
<td>Insulation</td>
<td>0.9</td>
<td>18</td>
</tr>
<tr>
<td>Paving</td>
<td>0.8</td>
<td>19</td>
</tr>
<tr>
<td>Windowsills, fasciaboards and bargeboards</td>
<td>0.7</td>
<td>20</td>
</tr>
<tr>
<td>Guttering and downpipes</td>
<td>0.4</td>
<td>21</td>
</tr>
</tbody>
</table>

*35% of PB and MDF is used in the building industry and 65% in furniture and other industries.

Source: Own calculations, compiled from Mapiravana, 2010; CIDB, 2011
An overview of the leading manufacturers of building materials per product is given in Table 5 below.

TABLE 5: AN OVERVIEW OF MAJOR BUILDING MATERIAL GROUPS

<table>
<thead>
<tr>
<th>Building product</th>
<th>Leading manufacturers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cement</td>
<td>PPC, Holcim, Lafarge, NPC</td>
</tr>
<tr>
<td>Reinforcing steel and sections</td>
<td>Mittal, Macsteel, Highveld, Cisco</td>
</tr>
<tr>
<td>Bricks and walling</td>
<td>Corobrick, Crammic, Biko, Rosema</td>
</tr>
<tr>
<td>Flooring</td>
<td>Belgotex, Nouvens, Domo, Ceramic Ind</td>
</tr>
<tr>
<td>Roofing and vertical cladding</td>
<td>Mittal, Macsteel, Lafarge, Marley</td>
</tr>
<tr>
<td>Aggregate and sand</td>
<td>Holcim, Lafage, Afrimat, WG Wearne</td>
</tr>
<tr>
<td>Doors</td>
<td>TDM, Nulu, Van Acht, Swartland</td>
</tr>
<tr>
<td>Frames</td>
<td>Wispeco, Dura, Nulu, Van Acht</td>
</tr>
<tr>
<td>Plumbing pipes and fittings</td>
<td>DPI, Petzetakis, Incledon</td>
</tr>
<tr>
<td>Roof trusses</td>
<td>Mitek, Federated, Iliad</td>
</tr>
<tr>
<td>Ceilings</td>
<td>BPB Gypsum, Everite, Lafarge</td>
</tr>
<tr>
<td>Glass and mirrors</td>
<td>PFG Glass, AFGLASS, Imports</td>
</tr>
<tr>
<td>Taps</td>
<td>Cobra, Watertech, Imports</td>
</tr>
<tr>
<td>Geysers</td>
<td>Kwikot, Frnake</td>
</tr>
<tr>
<td>Paving</td>
<td>Corobrik, Rosema, Briko</td>
</tr>
<tr>
<td>Windowsills and fascia-boards</td>
<td>Evertite, Hans Merensky</td>
</tr>
<tr>
<td>Guttering and downpipes</td>
<td>Buildmand, Everite, Petzetakis, Main Ind.</td>
</tr>
</tbody>
</table>

Source: CIDB, 2011

Highlights of the housing building materials and issues influencing supply are given in Table 6.

TABLE 6: HIGHLIGHTS OF THE HOUSING BUILDING MATERIALS AND ISSUES INFLUENCING SUPPLY

<table>
<thead>
<tr>
<th>Key supply sector</th>
<th>2011 issues influencing supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bricks</td>
<td>Energy costs</td>
</tr>
<tr>
<td></td>
<td>Transport costs</td>
</tr>
<tr>
<td></td>
<td>Mineral rights and other regulations governing mining</td>
</tr>
<tr>
<td></td>
<td>Environmental impact assessment processes</td>
</tr>
<tr>
<td></td>
<td>Energy-efficient brickmaking technologies</td>
</tr>
<tr>
<td></td>
<td>Alternative steel structures</td>
</tr>
<tr>
<td>Timber</td>
<td>Decline of afforestation</td>
</tr>
<tr>
<td></td>
<td>Pricing of inputs – administered prices</td>
</tr>
<tr>
<td></td>
<td>Labour legislation – minimum wages</td>
</tr>
<tr>
<td></td>
<td>Land reform policy</td>
</tr>
<tr>
<td></td>
<td>Reform of the South African Forestry Company Limited (Safcol)</td>
</tr>
</tbody>
</table>

Relative importance*
### 8. HIGH COSTS OF BUILDING MATERIALS

1. **Bricks**

The Clay Brick Association (CBA) estimates that total energy costs are about 30 per cent to 35 per cent of brick production costs. This is because electricity is used in the brick production process to crush and extrude the clay brick. Some coal is mixed into the extrusion. Energy costs have been rising due to an increase in coal prices that are approaching import parity prices. Electricity prices have also risen steeply in recent years (Development Bank of Southern Africa 2011).

2. **Steel**

The Development Bank of Southern Africa (DBSA) (2011) notes that primary steel production is concentrated around five facilities located in the Witwatersrand industrial heartland. The three exceptions are the ArcelorMittal Saldanha steel plant, located at the Saldanha harbour in the Western Cape (and largely export-oriented), ArcelorMittal’s Newcastle works, and the Cape Town Iron and Steel Works (Cisco) scrap-based steel mill and steel product plant. The DBSA argues that the market structure, pricing and location of the steel industry presents a risk for the South Africa economy.
3. Glass pricing and competition issues

The increase in the producer price index (PPI) for all glass products more or less matches the increase in the PPI for all sectors. However, price increases for glass supplied to the building industry significantly exceeded the increase in the overall PPI (DBSA 2011:12).

4. Plastic pipes and input polymer pricing

The DBSA (2011) estimates that polymer inputs are estimated to constitute some 40 per cent of plastic pipe-making costs, with labour costs comprising some 36 per cent. Upstream polymer suppliers tend to practice import parity pricing, which impedes downstream plastic convertor industries, including plastic pipe manufacturers.

5. Aggregates and sand

According to the Aggregate and Sand Producers Association of Southern Africa, only about half of quarrying activity is reported to the Department of Mineral Resources, and there are actually more than 1 000 quarries operating in the country. Regulation of this sector needs to be amplified.

7.2 Building and construction materials’ imports and export trends

The estimate of building materials’ imports and exports in 2008 is provided in Table 7 below.

<table>
<thead>
<tr>
<th>Product/material</th>
<th>Imports (%)</th>
<th>Exports (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulation</td>
<td>20-25</td>
<td>0-25</td>
</tr>
<tr>
<td>Particle board</td>
<td>5-10</td>
<td>Minimal</td>
</tr>
<tr>
<td>Medium density fibreboard</td>
<td>90</td>
<td>0</td>
</tr>
<tr>
<td>Glass</td>
<td>2-38</td>
<td>5-15</td>
</tr>
<tr>
<td>Plastic piping</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Timber prefab trusses</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Steel prefab trusses</td>
<td>15</td>
<td>85</td>
</tr>
<tr>
<td>Window frames</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Door frames</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Carpets</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Ceramic tiles</td>
<td>35</td>
<td>11</td>
</tr>
<tr>
<td>Galvanised iron</td>
<td>19-44</td>
<td>25</td>
</tr>
<tr>
<td>Chromadek/Globalcoat</td>
<td>15-25</td>
<td>35</td>
</tr>
<tr>
<td>Steel tiles</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>Cement</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Range</td>
<td>5-44</td>
<td>0-85</td>
</tr>
</tbody>
</table>

It can be noted that construction materials and products such as insulation, fibreboard, glass, trusses, galvanised iron and global-coat are under pressure from imports. These are the products that need to be prioritised for local production through incentives and local procurement.
9. ISSUES FOR STRATEGIC CONSIDERATION

9.1 Review the role of the state in housing delivery and empower beneficiaries in the construction of their homes

Government is facing a serious challenge in delivering houses sufficiently to meet the growing demand. It also carries the risk of having to provide warranties for poor workmanship on some of the low-cost houses. There is a need therefore to review the way houses are delivered and relieve government of the risks involved in the construction of houses. Housing support mechanisms must be established in order to support beneficiaries in the construction of their homes, where the state can provide land, infrastructure and subsidies. A technical housing support service staffed by competent community building teams (possibly a restructured NHBRC) must be established to assist beneficiaries to build structures of their choice that comply with norms and standards. In addition, government must assist homebuilders to obtain materials at reasonable prices from local building suppliers, which would help to strengthen the local economy. This will require a reform of the procurement system which must target housing cooperatives and emerging enterprises to supply building materials that comply with the norms and standards of structural construction.

9.2 Harmonisation of norms and standards of construction materials

In order to afford access to the construction materials manufacturing industry for diversified suppliers and to ensure the degree of market transparency that will create the conditions for a harmonized system of general rules in the construction industry, harmonized standards should be established as a matter of urgency. The National Building Regulations are framed around health and safety requirements. To date, the only compulsory standard in the construction industry is that for cement (DBSA 2011). Agrément South Africa certifies non-standardised/non-conventional construction products, through technical assessments that verify whether the products and systems are fit for purpose. Most of the standards do not prescribe the materials and construction solutions that may be provided to satisfy the regulations. The DBSA (2011) notes that there is an increase in sub-standard materials being used in the construction of houses. This is another area requiring considered attention, and the NHBRC, SABS and Agrément South Africa must work together in improving regulatory compliance and performance.

9.3 Reform of the procurement system and support for supplier development and localisation in the construction materials manufacturing industry

Broad-based black economic empowerment in the building and construction sector, including the materials manufacturing and distribution sectors, is influenced by the BBBEE Charters as follows:

- Construction Charter (design and construction sectors);
- Mining Charter (cement, aggregate and sand);
- Manufacturing Charter;
- Wholesale and Retail Charter; and
- Financial Charter.
Of these, only the Construction, Mining and Financial Charters have been finalised. There are opportunities for enterprise development for new entrants in the manufacture of products with low entry barriers particularly in low capital-intensive manufacturing sectors such as:

- Sand and aggregate;
- Cement bricks;
- Concrete tiles;
- Corrugated roof profiling; and
- Door and window manufacturing.

A recommendation is also made that government should prioritise the designation of construction materials and products such as insulation, fibreboard, glass, trusses, galvanised iron and global-coat. These are the products that need to be prioritised for local production through incentives and local procurement. There is a need to reform procurement policies in the construction and delivery of low-cost houses funded by the government. The public housing programme must be linked to industrial policy objectives and government should prioritise the designation of construction materials and products for local production. This will require an emphasis on local procurement, especially in the sourcing of materials for construction and delivery of low-cost houses funded by the government. Emphasis should not only be placed on the final delivery of houses but also on leveraging public expenditure to expand and diversify suppliers of construction and building materials. Local production, supplier and enterprise development should be mandatory in the request for proposals (RFPs) for public housing delivery.

9.4 Stakeholder engagement and coordination

In developing the construction materials manufacturing industry strategy to localise building materials for low-cost housing, it is important that the Department of Trade & Industry engages strategic departments in the delivery and financing of housing, including the industry and financial institutions involved in the value chain of housing delivery. Important departments include the Department of Human Settlements (policy), National Treasury (funding), the NHBRC (housing regulations), Agrément South Africa (building material certification) and the SABS (standards and quality).

10. CONCLUSION

This study sought to assess opportunities and challenges in the building and construction of publicly provided houses. There are opportunities for growth in the local production of construction materials. Government must leverage expenditure in the sector to foster job creation, enterprise and supplier development in the housing delivery value chain. Areas of focus for strategic industrial policy interventions are supplier development and localisation, reforming public procurement for low-cost housing delivery, emphasis on standards and quality housing delivery, and stakeholder engagement and coordination. These interventions can generate positive economic externalities which are an embodiment of effective industrial policy.
References


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THE MOTOR INDUSTRY DEVELOPMENT PROGRAMME 1995-2012: What have we learned?

Justin Barnes\(^1\)
Anthony Black\(^2\)

ABSTRACT

The Motor Industry Development Programme (MIDP) has been one of the most significant industrial policy interventions since 1994, both because of the powerful incentive structure it established and because of the sheer size of the industry it impacted. Because of these factors, as well as the cost of support, this industry is central to any analysis of the impact of South African industrial policy on employment and inclusive growth – and not only within the sector itself but more importantly on the economy as a whole. This experience also has lessons for the conduct of industrial policy in other sectors.

The MIDP reduced tariffs and provided strong support for exports. The result was rapid export expansion, although the sector remains vulnerable to declining support. Domestic consumers have far greater choice but increased vehicle and parts imports have contributed to a growing trade deficit. Progress has been made in rationalising the industry but it still operates below minimum efficient scale. While growing investment and much higher levels of foreign ownership have modernised the sector and integrated it into global production networks, the orientation of MNCs is towards the domestic market and South Africa is a long way from being a true export platform for global firms.

The paper concludes with some lessons from nearly two decades of policy experience, including some comments about the recent introduction of the replacement Automotive Production and Development Programme (APDP). The growth and structure of the industry has arguably been overly influenced by automotive policy. Long term certainty and gradual policy adjustments should be the objective and policy makers must be cautious about policy which diverts too far from market outcomes. While the MIDP has made a positive impact on the development of the industry, its provision of easy access to import credits has resulted in a rapid climb in imports, arguably to unsustainable levels. This trend has continued under the APDP in 2013 and needs to be substantially curbed. One objective of policy should be to reduce the share of imported vehicles and components below current levels.

The important question of cost of the MIDP is only briefly addressed. The key point is that the MIDP marked a decline in support from its inception and this support declined steadily throughout the course of the programme. A related question is whether the sector will continue to rely on high levels of state assistance to remain viable. In this regard, one fundamental recent change has brightened prospects considerably. Rapid growth in the southern African region and in Africa as a whole, in the medium term, provide a large and rapidly growing regional and continental market, the lack of which has always been the Achilles’ heel of the domestic industry. Properly handled, this represents an opportunity for rapid and sustainable growth in the sector in South African and the region.

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\(^2\) Professor, PRISM and School of Economics, University of Cape Town and corresponding author Anthony.black@uct.ac.za
Both authors have been extensively involved as advisors to the dti on automotive policy.
1. INTRODUCTION

The automotive industry is one of South Africa’s largest manufacturing sectors and has a long history of government support. From 1995 to 2012 it was subject to the Motor Industry Development Programme (MIDP) which has perhaps been the most significant industrial policy intervention since 1994, both because of the powerful incentive structure it established and because of the size of the industry it impacted.

The South African automotive industry grew under high levels of protection. While considerable diversified development took place under this protective regime, the industry was highly inward-oriented. In a process which began in 1989 and accelerated with the introduction of the MIDP in 1995, the automotive industry has become increasingly exposed to international competition as government has sought to make it more competitive and also to encourage exports and a more rational industry structure. Lower tariffs were accompanied by import-export complementation arrangements, which enabled firms to rebate import duties by exporting. As a result of these measures, the industry has been through a period of rapid international integration and structural change.

Trade liberalisation reduces the prices of liberalised products relative both to other goods in the domestic market and to similar commodities internationally. Both standard trade theory and the general equilibrium models used to analyse the sectoral impact of tariff reductions predict a fall in output for the affected sector with the benefits accruing to the rest of the economy in the form of lower prices and a more efficient allocation of resources. However, the reality at the sectoral level is more complex especially in the context of import-export complementation arrangements and there are a number of important dynamic effects, which impact on outcomes in the sector in question. While the reduction in relative prices would of itself be to the detriment of the sector, these changes are refracted through the prism of variables such as domestic demand (influenced by lower prices), structural change (which may reduce production costs), growing international integration (which will impact on investment and trade in the sector) and productivity enhancement (influenced by the level of investment and by growing competition). These dynamic effects are of particular importance in a sector such as the automotive industry where economies of scale are important and where a handful of multinational vehicle producers dominate global production and exercise considerable influence over the location of new investments by first tier component suppliers. In this environment, comparative advantage is much less a function of existing endowments as suggested by conventional trade theory. Rather, comparative advantage emerges as the outcome of three complex, interrelated forces: the global strategy of multinational corporations, host country policy and domestic (and regional) market conditions.

Views on the impact of the MIDP vary widely. In his overview of economic reform since 1994, Hirsch (2005:159, 250) cites the MIDP as one of the “notable successes” of this period and argues that “the automobile assembly and component sectors were strongly assisted by a well-designed Motor Industry Development Programme”. While acknowledging the strides made in productivity, earlier work by Barnes and Kaplinsky (2000a, 2000b) points to weaknesses in the domestically owned component industry and the growing role of foreign ownership. Barnes, Kaplinsky and Morris (2004) argue that it helped develop dynamic competitive advantage in the industry. Black (2009), while acknowledging that the MIDP has facilitated a strong supply response to the changed incentive regime because it encouraged international automotive firms to integrate South African-based producers into global networks, points to the limitations of this process and the fact that South Africa is far from being an export hub. Flatters and Netshitomboni (2007) take a much more critical view, citing the heavy costs of the MIDP and arguing for more rapid liberalisation. The MIDP has also received considerable positive media comment over a long period.\(^3\) This has focused on what has been achieved, for example, in

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terms of export expansion, new foreign investment or vehicle prices. More recently, there has been a greater focus on negative attributes, especially the costs of the programme.4

The aim of this paper is to assess the impact of the MIDP in terms of the objectives set by government. It also briefly considers the question of whether the MIDP has been worth its heavy cost and what lessons can be learned for industrial policy more generally. Section two provides a brief overview of the development of the industry. The MIDP and its objectives are explained in section three. The main part of the paper (section four) examines the impact of the MIDP. Section five concludes with some lessons from this experience.

2. THE DEVELOPMENT OF THE SOUTH AFRICAN INDUSTRY

The South African vehicle market grew very rapidly from 1950 to the early 1980s with sales increasing tenfold over this period. The market stagnated during the 1980s as the economy entered a phase of very slow expansion with growth constrained by political instability and increasing international isolation. Gradual recovery followed and after 2002, sales grew strongly, boosted by rising incomes, a strong Rand and low interest rates, reaching record sales levels of 714,000 units in 2006. Sales plummeted in the aftermath of the global financial crisis, but recovered to reach 624,000 vehicles in 2012. This constitutes a relatively small market in global terms and the regional market, apart from South Africa, remains very small. Production has tracked sales quite closely but recently has failed to keep pace with expansion in the domestic market. In 2012, 540,000 vehicles were produced, of which 52.4 per cent were exported.

<table>
<thead>
<tr>
<th>YEAR</th>
<th>PASSENGER CARS</th>
<th>LIGHT COMMERCIAL VEHICLES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Domestic</td>
<td>Exports</td>
</tr>
<tr>
<td>1995</td>
<td>233,512</td>
<td>8,976</td>
</tr>
<tr>
<td>1996</td>
<td>231,616</td>
<td>3,743</td>
</tr>
<tr>
<td>1997</td>
<td>215,784</td>
<td>10,458</td>
</tr>
<tr>
<td>1998</td>
<td>174,870</td>
<td>18,342</td>
</tr>
<tr>
<td>1999</td>
<td>159,944</td>
<td>52,347</td>
</tr>
<tr>
<td>2000</td>
<td>172,373</td>
<td>58,204</td>
</tr>
<tr>
<td>2001</td>
<td>172,052</td>
<td>97,599</td>
</tr>
<tr>
<td>2002</td>
<td>163,474</td>
<td>114,025</td>
</tr>
<tr>
<td>2003</td>
<td>176,340</td>
<td>114,909</td>
</tr>
<tr>
<td>2004</td>
<td>200,264</td>
<td>100,699</td>
</tr>
<tr>
<td>2005</td>
<td>210,976</td>
<td>113,899</td>
</tr>
<tr>
<td>2006</td>
<td>215,311</td>
<td>119,171</td>
</tr>
<tr>
<td>2007</td>
<td>169,558</td>
<td>106,460</td>
</tr>
<tr>
<td>2008</td>
<td>125,454</td>
<td>195,670</td>
</tr>
<tr>
<td>2009</td>
<td>94,379</td>
<td>128,602</td>
</tr>
<tr>
<td>2010</td>
<td>113,740</td>
<td>181,654</td>
</tr>
<tr>
<td>2011</td>
<td>124,736</td>
<td>187,529</td>
</tr>
<tr>
<td>2012</td>
<td>121,677</td>
<td>153,196</td>
</tr>
</tbody>
</table>

Note: Medium and heavy commercial vehicles are excluded from this table.
Source: Automotive Industry Export Council (AIEC) (2013)

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4 See for example Financial Mail 23 May 2013
There are currently seven producers of light vehicles in South Africa and there have been no major new entrants into the assembly industry over the last decade. There has, however, been a significant increase in foreign ownership and all assemblers are now wholly owned by multinational firms. This was not the case in the early 1990s, when most assemblers were under majority local ownership. There has also been growing foreign ownership in the component sector, which numbers some 350 firms. The majority of large component firms (over 500 employees) are now foreign-owned.

Early policy developments

In many respects, South Africa followed a programme of import substitution similar to that adopted in other developing countries, especially in Latin America. High tariffs were placed on built up vehicles which, when combined with a rapidly growing market, acted as a magnet to a large number of (initially foreign) companies which established assembly plants in the country. These operations, although in many cases highly profitable, were very small in international terms with correspondingly high unit costs. Production was aimed solely at the domestic market and the South African assembly plants were kept isolated from the global production networks of the parent companies except as markets for completely knocked down (CKD) packs of imported parts (Black 2001).

The first in a series of local content programmes was introduced in 1961 and followed by a number of adjustments which increased local content requirements over time. Considerable diversified development took place under this protective regime. Imports of vehicles were minimal. A major driver was foreign direct investment but there was also significant domestic ownership, especially in the component sector. The component industry developed significant investment and production capability as well as the capacity to innovate in process development and to a lesser extent in product development. A major problem was the failure to use some form of industrial policy to limit the excessive proliferation apparent in the large number of models and makes of vehicle being assembled in low volume. This in turn forced component firms to produce at below efficient scale.

The problems of high protection and associated low volume production had become increasingly apparent by the late 1980s. South Africa’s automotive industry was inefficient and highly inward-oriented. Phase VI of the local content programme, introduced in 1989, marked the beginning of reduced protection for the industry. The component sector was partly liberalized and vehicle producers could meet part of their local content requirements by exporting and, as such, were proactive in developing international marketing channels. Exports rose rapidly from negligible volumes in the mid-1980s to R2,245 million in 1994. The level of protection on built-up vehicles, however, remained prohibitive at 115 per cent (100 per cent ad valorem plus 15 per cent surcharge). In the early 1990s, South African car prices were well above international prices and Phase VI was widely blamed in the media and by industry analysts as being a contributing factor. Also, Phase VI did nothing to reduce the proliferation of models being assembled domestically. This proliferation of models was in turn one of the major reasons for the component sector being uncompetitive.
3. THE MOTOR INDUSTRY DEVELOPMENT PROGRAMME

The Introduction of the MIDP

Phase VI was heavily criticised, particularly from the component producer federation, NAACAM, who were concerned with rising import competition and the fragmented structure of the assembly industry. In late 1992, a tripartite forum, the Motor Industry Task Group (MITG) was appointed to re-examine the programme and advise government as to the future development policy for the industry. Government also made it clear that tariffs had to be reduced in line with the country’s General Agreement on Tariffs and Trade (GATT) obligations.

All stakeholders were able to agree on the basic architecture which drew on the 1985 Australian Passenger Motor Vehicle Manufacturing Plan, more commonly known as the ‘Button Plan’, that consisted of duty phase-downs and a facility under which vehicles and component exporters could rebate import duties. However, there were protracted and sometimes acrimonious discussions on the actual levels of these policy parameters. In the final announcement of the MIDP, the government only partly accepted the recommendations of the MITG. Most notably, the contentious proposal to encourage higher model volumes and force a degree of rationalisation was not accepted, as a result of strong opposition from the vehicle producers’ federation, NAAMSA.

The MIDP continued the direction taken by Phase VI and entrenched the principle of import-export complementation. However, it went a step further by abolishing local content requirements and introducing a tariff phase-down at a steeper rate than required by the terms of South Africa’s offer to the GATT.

The main elements of the MIDP were the following:5

a. The excise duty-based local content system was dropped and replaced by a tariff-driven programme.

b. Tariffs on light vehicles were to be phased down to 40 per cent for light vehicles and 30 per cent for components by 2002.

c. Manufacturers of light vehicles for the domestic market were entitled to a duty free allowance (DFA). Components to the value of 27 per cent of the wholesale price of the vehicle could be imported duty free.

d. Import duties on components and vehicles could be offset by Import Rebate Credit Certificates (IRCCs) derived from the export of vehicles and components.

While nominal duties on imported vehicles were set to remain quite high in the medium term, the ability to rebate import duties by exporting, enabled importers to bring in vehicles at lower effective rates of duty. Import-export complementation also enabled assemblers to use import credits to source components at close to international prices. These credits could also be traded. Thus declining nominal protection on vehicles was, to some extent, compensated by reduced protection for components.

An important difference with the Australian plan was the fact that import credits could be earned on the full domestic content value of exports, including raw material content. In the Button plan, only value added within the automotive industry qualified. The result of this distinction was that the MIDP provided a strong export incentive on products with high raw material content and corresponding low ‘automotive value added’. The DTI was itself divided on this issue and after the introduction of the MIDP, the feasibility of a ‘value added’ system was investigated but never implemented. This proved to be a serious error. Exceptionally rapid export growth, especially of raw material-intensive components such as automotive leather and catalytic converters, led to a rapid decline in protection for the component sector, and a disincentive on the part of vehicle assemblers to increase their local content levels.

5 A Small Vehicle Incentive (SVI) was also introduced, which gave vehicle assemblers an additional duty rebate incentive on the assembly of entry-level vehicles. This incentive was, however, removed in 1999.
To assess the impact of the MIDP and provide long term policy certainty to the industry, the DTI conducted two policy reviews, in 1998 and 2002. These extended the MIDP, first until 2007 and later until 2012 but on a phasing down basis. The gradual decline in tariffs continued and the import/export complementation provisions were retained, although the qualifying value of eligible export performance declined from 2003 (Table 2). This meant that while exports of components with a local content value of R100 would allow the exporter to import R100 of components on a duty free basis in 2002, by 2012 only components to the value of R70 could be imported. Coupled with the continuing phase down of tariffs this meant that export assistance was reduced quite rapidly. It also offset, to some extent, the liberalising effect of tariff reductions by requiring a greater level of exports to rebate duties on a given level of imports.

In the 1998 review there were again extensive discussions regarding the imposition of direct industrial policy measures to rationalise the industry, but these were not adopted. An important late change introduced into this process as a result of concerted pressure on the Minister of Trade and Industry by vehicle manufacturers, who were planning major export programmes, was the introduction of a Productive Asset Allowance (PAA). In terms of the PAA, firms making ‘qualifying investments’ received import duty credits equal to 20 per cent of the value of these investments, spread over five years.

The Objectives of the MIDP

The initial objectives of the MIDP were to provide high quality affordable vehicles, provide sustainable employment and through increased production, contribute to economic growth (Department of Trade and Industry 1997). More specifically, the MIDP was devised as a trade facilitating measure with very particular industrial policy objectives. As a result of protection, the industry structure had historically been highly fragmented and the resultant failure to achieve economies of scale had not only made the assembly industry inefficient, but imposed major negative externalities on the component sector. Therefore an objective of the MIDP was to increase the volume and scale of production through a greater level of specialisation in terms of both vehicle models and components. The MIDP sought therefore to provide support for the automotive industry on a gradually declining basis. This required it to meet a number of objectives, including some protection for vehicle assembly and components production as well as support for exports and investment.

6 ‘Qualifying investments’ had to contribute to the rationalisation of the industry. Component producers could also qualify but the vast share of the PAA went to vehicle producers.
<table>
<thead>
<tr>
<th>Year</th>
<th>Import duty</th>
<th>Qualifying value of eligible export performance</th>
<th>Qualifying PGM content</th>
<th>Ratio of exports against imports</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Built up light vehicles</td>
<td>Original equipment components</td>
<td>Built up vehicles and components (excluding tooling)</td>
<td>Catalytic Converters exported</td>
</tr>
<tr>
<td>1999</td>
<td>50.5%</td>
<td>37.5%</td>
<td>100%</td>
<td>90%</td>
</tr>
<tr>
<td>2000</td>
<td>47%</td>
<td>35%</td>
<td>100%</td>
<td>80%</td>
</tr>
<tr>
<td>2001</td>
<td>43.5%</td>
<td>32.5%</td>
<td>100%</td>
<td>60%</td>
</tr>
<tr>
<td>2002</td>
<td>40%</td>
<td>30%</td>
<td>100%</td>
<td>50%</td>
</tr>
<tr>
<td>2003</td>
<td>38%</td>
<td>20%</td>
<td>94%</td>
<td>40%</td>
</tr>
<tr>
<td>2004</td>
<td>36%</td>
<td>28%</td>
<td>90%</td>
<td>40%</td>
</tr>
<tr>
<td>2005</td>
<td>34%</td>
<td>27%</td>
<td>86%</td>
<td>40%</td>
</tr>
<tr>
<td>2006</td>
<td>32%</td>
<td>26%</td>
<td>82%</td>
<td>40%</td>
</tr>
<tr>
<td>2007</td>
<td>30%</td>
<td>25%</td>
<td>78%</td>
<td>40%</td>
</tr>
<tr>
<td>2008</td>
<td>29%</td>
<td>24%</td>
<td>74%</td>
<td>40%</td>
</tr>
<tr>
<td>2009</td>
<td>28%</td>
<td>23%</td>
<td>70%</td>
<td>40%</td>
</tr>
<tr>
<td>2010</td>
<td>27%</td>
<td>22%</td>
<td>70%</td>
<td>40%</td>
</tr>
<tr>
<td>2011</td>
<td>26%</td>
<td>21%</td>
<td>70%</td>
<td>40%</td>
</tr>
<tr>
<td>2012</td>
<td>25%</td>
<td>20%</td>
<td>70%</td>
<td>40%</td>
</tr>
</tbody>
</table>

**Sources:** Adapted from Black and Barnes (2003) and National Association of Automobile Manufacturers of South Africa (NAAMSA) (2005)

**Notes:** The Duty Free Allowance of 27% remained unchanged during this period. The Productive Asset Allowance (PAA) was put in place until 2007 to be reviewed later.

Essentially what was sought was a transition from completely knocked down (CKD) assembly, which was characteristic of vehicle production in protected developing country markets, through a transition stage to full manufacturing (Table 3). CKD assembly involves relatively light investments in spite of the fact that the need for precision welding and advanced painting processes in modern CKD plants increasingly requires larger capital outlays (Sturgeon & Florida 1999). Under CKD assembly, production, costs are usually quite high especially if a high level of localisation is stipulated by government policy. High local content requirements necessarily demand much higher levels of investment and tend to encourage rationalisation.
TABLE 3: STAGES IN THE DEVELOPMENT OF VEHICLE PRODUCTION IN SOUTH AFRICA

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


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

4. THE IMPACT OF THE MIDP

International competition in the South African automotive industry increased substantially as a result of the MIDP. Vehicle manufacturers faced the prospect of the domestic market being eroded by imports as tariffs were reduced from prohibitive levels and as growing exports enabled firms to offset import duties. The component sector, which had only just begun the transition from low volume, flexible production, faced further restructuring and consolidation. The outcome of the shift towards more open markets depended not only on the level of import penetration, but also on the supply response of firms, especially in investment and export expansion.

Automotive trade: The share of imports

As protection is reduced, imports can be expected to gain a larger share of the domestic market and rapid import expansion can threaten the viability of local producers, not only by eroding their domestic market share but also by limiting their capacity to take advantage of new export opportunities. Until the early 1990s, high protection resulted in very low volumes of vehicle imports. However, total imports of vehicles and components have grown at a more rapid rate than policy makers expected, in nominal terms from R16.4 billion in 1995 to R136.1 billion in 2012 (AIEC 2013:32). Automotive imports account for a significant share of total imports; on average approximately 17 per cent between 1995 and 2012 (Figure 1). Interestingly, the overall share of automotive imports has not increased over the period although it is highly cyclical. This, of course, is indicative

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7 The term ‘derivative’ refers to the different permutations within a ‘basic model’. Examples include engine size and body (e.g. saloon or hatchback) configuration. The carmaker would also have to offer more minor permutations such as a wide range of colours, types of steering wheel etc.
of the rising share of imports in the South African economy as a whole. Nevertheless, the major contribution of the automotive sector to South Africa’s trade deficit has significant macroeconomic implications.

Figure 2 shows that at the inception of the MIDP, the automotive trade balance improved. From 2004, a recovering rand and booming consumer demand led to rapid growth in imports and a deteriorating trade balance. In 2008, record vehicle exports helped the deficit return to a more stable level (dti 2009), followed by the slump in both exports and imports in the aftermath of the global financial crisis. Since 2009, the marginal growth in exports has been overwhelmed by the rapid increase in imports.

The nominal tariff on light vehicles, at 25 per cent in 2012 was still reasonably high and cannot on its own explain the rapid increase in automotive imports. A key factor was that the MIDP enabled firms to rebate import duties by exporting. An important aspect of the strategy of the carmakers operating in South Africa was to expand market share via a combination of local production and vehicle imports. Importing vehicles and components incurred import duties and much of the strategic behaviour of firms was therefore directed at optimising their duty position.

Sources: Duxbury (2013), NAAMSA Annual Reports (various years), Automotive Export Manual (various years), SARS.
Minimising duty payments could be achieved in a number of ways. Firstly, firms could limit vehicle imports. Secondly, local content in domestically produced vehicles could be increased. Thirdly, vehicle producers could expand exports either of vehicles or components. As exports increased so did the ability to import automotive products without paying duty. In addition, carmakers undertaking specified investments which qualified under the Productive Asset Allowance also received import credits although these were at a relatively low level in comparison to the credits earned via exporting. The value of Import Rebate Credit Certificates is therefore central to understanding the impact of exports on the ability to offset import duties. In this respect it is important to note the phasing down in the qualifying percentage of platinum in catalytic converter exports from 1999 and the phased reduction in the qualifying percentage of all exports from 2003 (Table 2). In spite of the phasing down of export assistance, vehicle manufacturers were able to offset nearly all import duties. From 1996-2011, the average level of duty paid by vehicle manufacturers was only 0.6 per cent of the total value of their imports of vehicles and components over this period.\(^8\)

**Vehicle Imports**

The opening up of the economy and the phasing down of tariffs have led to an increased level of light vehicle imports from under two per cent of the market in 1990 to 13.9 per cent\(^9\) in 1997 and nearly 40 per cent by 2005. Until the surge in imports during 2004-2005, increases were roughly in line with the expectations of policymakers and from 1999 to 2003, the numbers of vehicles exported in some years exceeded imports. By 2012, the share of imported vehicles had increased to 58.1 per cent of total new vehicle sales (AIEC 2013).

Domestic vehicle producers, especially those firms which had established large-scale vehicle export programmes, accounted for the major share of vehicle imports. This expansion was related to the rationalisation of production in the domestic market to a reduced number of platforms, the raising of production per model...
and growing exports. This strategy generally required an export allocation by the parent company, which in turn was seeking to expand market share (including the sale of imported models) in South Africa.

Components and Local Content

A key policy issue in the development of the automotive sector both in South Africa and other developing countries was the level of local content in domestically assembled vehicles. Local content can be defined in a number of ways and is very difficult to measure. The ‘level’ of local content is also subject to the vagaries of the exchange rate. For example, the ‘official’ definition of local content as vehicle wholesale price (value of production), less the vehicle assemblers’ imported content in Figure 3, overstates the actual position as it includes assembly costs and profit margins, as well as imported content embedded in locally purchased components. With no change in the actual sourcing of components, higher prices and profits would mean a ‘higher’ level of local content, while the increased sourcing of imported components or materials by Tier 1 and Tier 2 suppliers would similarly not be captured in the figure. The trend depicted in Figure 3 is likely to be accurate, although the actual level of local content in South African-assembled vehicles has probably averaged somewhere between 40 per cent and 50 per cent over the period.

![FIGURE 3: LOCAL CONTENT IN LIGHT VEHICLES BASED ON VALUE OF PRODUCTION LESS IMPORTED CONTENT](image)


Another indicator is the value of original equipment imports per domestically assembled vehicle. In constant Rands this doubled from R107,000 per vehicle in 1996 to over R200,000 per vehicle in 2008 before declining to R168,000 in 2012 (Duxbury 2013). A complicating factor here is the changing profile of vehicles produced. For example, part of this increase is accounted for by increasing production for export of relatively expensive vehicles such as the BMW 3 Series and Mercedes C Class.

Under the MIDP, protection of the component sector was reduced. Local content requirements were abolished and duties declined, albeit gradually. Apart from declining protection, there are a number of further considerations. One of the objectives of the MIDP was to increase model volumes. These increased and could be expected to have a positive impact on the level of local content. There has also been significant foreign investment by first tier suppliers and a further question is the extent to which these firms are engaged in assembly of imported parts or draw on the domestic supply base of second tier firms. In many instances, these firms operate as just-in-time sub-assemblers of imported components using technologically advanced
assembly jigs and testing equipment. They are not, however, responsible for any materials conversion processes and as such cannot be considered true manufacturers. The advanced materials conversion (and the associated tooling and technology investment) takes place outside of South Africa and local content and local value adding, even on large-scale vehicle export projects, has remained low (Black 2009). This latter characteristic is supported by data drawn from the automotive component firms which belong to the South African Automotive Benchmarking Club and shows striking differences in the purchasing patterns of local and foreign-owned component firms. Domestic component firms had local content of nearly 90 per cent while the local content level for foreign-owned component firms was below 70 per cent. The reliance on foreign inputs partly reflects the assembly or ‘system integrator’ character of many foreign-owned supplier operations and is in part a global trend. This lack of local embeddedness may partly result from the limited time that foreign-owned suppliers have been operating in South Africa, but it also reflects the fact that many vehicle models are still being produced in volumes of 50,000 units per annum or less, which does not justify heavy investment in component production.

The increase in local content since 2008 may, in part, be due to the announced provisions of the APDP. Local content levels are planned well in advance of new models being introduced and since the announcement of the basic parameters of the Automotive Production and Development Programme (APDP) in 2008, there have been some indications that local content levels may increase. A number of vehicle assemblers have cited the APDP as the reason for announced increases in local production and higher levels of local content. However, these measures of local content include assembly so actual local content in terms of local parts in domestically assembled vehicles would be much lower. It should be noted that in the past, intended and announced plans have frequently not materialised, although the current weakness of the Rand will encourage localisation.

On balance, one can conclude that there has been little change in local content since the introduction of the MIDP. However, local content levels had previously already declined during Phase VI and were low in absolute terms. The growth in model production volumes has certainly not led to any significant increase in local content but may have stabilised the situation under a regime of falling protection.

The Supply Response: Exports

The growth of automotive exports has been the most striking feature of the development of the automotive industry under the MIDP. Total automotive exports at the start of the Phase VI programme in 1989 were only R443 million. At the inception of the MIDP in 1995 they amounted to R4.2 billion and by 2012 had reached R86.9 billion. In real terms this represents a compound annual growth rate of 12.1 per cent (Duxbury 2013). In 1995, automotive exports accounted for just 4 per cent of total exports. This increased sharply to nearly 15 per cent in 2003 but has since declined to just over 12 per cent in 2012 (Figure 5).

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10 See, for instance, Humphrey and Salerno (2000).

11 Among Japanese electronics multinationals, Belderbos, Capanelli and Fukao (2001) found that Greenfield investments have lower local content than either joint ventures or acquired firms due to the latter’s embeddedness in the local economy.

A number of factors have accounted for rapid export expansion. The most important has been the import-export complementation arrangements under Phase VI and the MIDP. A second factor has simply been that falling protection and limited domestic market growth until the mid-2000s forced firms into the export market. Thirdly, the Rand was quite weak over part of the period. The global downturn of 2009 led to a sharp reduction of South African automotive exports. Component exports to South Africa’s largest market, the European Union, fell from €3.38 billion in 2008 to €2.13 billion in 2009 and have been slow to recover.
It is clear that the MIDP’s incentive structure strongly favoured exports, but the very strong supply response to changes in the policy regime is also partly attributable to the nature of the automotive industry value chain. Because lead firms in the automotive value chain control global networks of assembly operations and linked supplier companies, they were able to rapidly facilitate exports either from their own South African operations or from South African-based suppliers to their international operations.

**Vehicle exports**

Vehicle exports have grown rapidly but as Figure 4 indicates, they lagged component exports during the early stages of the MIDP. Given the growth in exports of ‘peripheral’ components (such as automotive leather and catalytic converters) in the early years of the MIDP and the relatively slow growth of vehicle exports until the late 1990s, policy makers were concerned that vehicle producers were using the trade complementation arrangements of the MIDP to pursue ‘low volume’ as opposed to ‘rationalisation’ strategies. The problem was that vehicle manufacturers initially adopted a strategy of generating import credits by exporting components, which required only light investments. This allowed them to continue to introduce new low volume models into the domestic market utilising imported components. Adopting this strategy offered an ‘easy’ route to achieving duty neutrality, certainly much easier than increasing local content in low volume locally assembled vehicles. It also caused concern among established original equipment component suppliers to the domestic market who found assemblers adopting much more aggressive pricing strategies. But this strategy also left vehicle producers in a vulnerable position. By failing to increase vehicle volumes through exporting, unit production costs remained high and vehicle manufacturers were progressively less able to compete as tariff reductions continued.

High volume vehicle exports are not just a function of competitiveness but depend on the global strategy of the parent company, including its desire to optimise global production capacity in the context of the policy regime prevailing in each production location. The parent company needs to take the major strategic decision to allocate specific markets to the home country assembler and then follow this up with the required investments. Rising production efficiencies, pressure on local margins as well as clear government policy are necessary to force the hand of the parent company. The result is that exports increase in a non-incremental fashion, dependent on the award of long term contracts. For instance, the three German firms (BMW, Mercedes and Volkswagen) were the first to be incorporated as vehicle exporters into their respective parent company networks. The result was that by 2001 these three firms exported over 90,000 vehicles while exports by the other four assemblers totalled only approximately 10,000 vehicles.

The boom in vehicle exports was driven by the MIDP. Firms did not perceive South Africa as an export platform. Nevertheless, costs were low in some respects and the weak currency up until 2002, and after 2011 offered some advantage. However, the South African operations incurred significant cost disadvantages in the area of inbound and outbound logistics. This was a function of high transport costs and long distances to foreign markets as well as high levels of imported content. The expansion of low cost capacity in central Europe posed a further problem. As a result, South African firms were essentially ‘swing’ producers into a wide range of markets depending on fluctuations in global demand, thereby occupying a peripheral position in the global networks. An indication of this is that no South African assembler has yet been allocated sole or even lead global responsibility for a single model.

The regional market has been of only minor importance. Apart from the small size of these economies, cheap imported used vehicles have undermined their markets for new cars, although rapid growth in the rest of Africa together with developing regional integration arrangements means that the market is growing in importance. For example, in 2005 vehicle exports to SADC amounted to only R890 million, or 4.2 per cent of total vehicle exports. By 2012, the figure had increased to R3.7 billion, or 7.6 per cent of light vehicle exports. The real growth has taken place into other African markets, with Africa as a whole accounting for 22 per cent of light vehicle exports by value in 2012. If all automotive exports are considered, Africa looks set to overtake North America as the second largest regional market for South African automotive exports after Europe.
Component Exports

As indicated in Table 4, component exports have expanded dramatically. From a low base of R3.3 billion in 1995, component exports expanded to R44.1 billion in 2008 before declining to R36.9 billion in 2012. A key objective of the import-export complementation scheme under the MIDP was to assist component suppliers to generate high volumes which would make them more efficient, and able to compete in the domestic market against imports. A linked objective was that reduced production costs would have the added benefit of providing lower input cost into the assembly industry. The objective of higher component volumes was certainly achieved, at least in the sense that export development was usually accompanied by higher volumes and specialisation. Many component producers rationalised their product lines.

However, the nature of export expansion has raised two concerns. Firstly, there is the issue of the implications for the overall integration of the industry, particularly given the profile of products being exported. Secondly, there is the question of the sustainability of the rapid export expansion that has taken place.

| TABLE 4: MAJOR COMPONENT EXPORT CATEGORIES, 1995-2012 (R MILLION) |
|------------------|---------------|---------------|----------------|----------------|
|                   | 1995          | 2005          | 2012           | % of 2012 total |
| Total             | 3,316         | 23,000        | 36,867         | 100.0          |
| Catalytic converters | 389         | 9,935         | 16,347         | 44.3           |
| Engine parts      | 102           | 1,000         | 2,875          | 7.8            |
| Silencers/Exhausts | 76           | 492           | 1,730          | 4.7            |
| Stitched leather seat parts | 1,019 | 2,693 | 1,719 | 4.7 |
| Tyres             | 213           | 1,183         | 1,522          | 4.1            |
| Radiators and parts | 66          | 220           | 945            | 2.6            |
| Automotive tooling | 153           | 332           | 782            | 2.1            |
| Transmission shafts/cranks | 55          | 553           | 771            | 2.1            |
| Engines           | 9             | 781           | 559            | 1.5            |
| Road wheels and parts | 157         | 738           | 466            | 1.3            |
| Other             | 1,077         | 5,073         | 9,151          | 24.8           |

Source: AIEC (2013)

Note: The 'other' parts figure includes parts of parts, which are not identified as being specific to a particular component.

The profile of component exports and implications for industry integration

A wide range of components were exported under the MIDP. In 2012 there were no less than 23 component categories for which exports were R100 million or more. But a striking feature is the large share of total exports taken up by a few component categories. Catalytic converter exports alone amounted to R16.3 billion (44.3 per cent of component exports) in 2012. From the early years of the MIDP, catalytic converters have been the product of choice for carmakers wanting to generate import credits. From the perspective of multinational carmakers wanting to rapidly generate exports, catalytic converters offered a number of advantages. Global demand for catalytic converters was expanding rapidly due to environmental legislation and their platinum content makes catalytic converters high value products.

In 1995 the industry supplying leather seat covers accounted for 30.7 percent of total component exports and continued to grow rapidly until the early 2000s, but has since declined. Over the period, South Africa supplied the bulk of BMW’s global automotive leather requirements and was an important supplier to a number of other foreign vehicle manufacturers. Major export categories such as catalytic converters, silencers/exhausts
and stitched leather seat parts could be described as ‘peripheral’ in the sense of being relatively minor components, which have high raw material content and are not particularly complex in terms of incorporating large numbers of sub-components. The bulk of export expansion has, therefore, not been by ‘traditional’ component suppliers but by a rapidly emerging new group of mainly foreign-owned firms frequently with links to vehicle manufacturers. Relatively light investments with a low level of integration into the domestic industry, either in supply to domestic vehicles or the use of sub-components, have been one outcome. Because exports account for the majority share of output in most of these cases, domestic consumers (either assemblers, first tier suppliers or the aftermarket) did not receive the benefit of reduced costs due to economies of scale. It could be argued, therefore, that local assemblers in conjunction with their multinational parents developed large component export businesses which did not contribute to the more integrated development of the automotive industry.

However, the argument that the profile of component exports is dominated by a few categories needs to be qualified. Firstly, if the growing volume of vehicle exports is included in the export profile, the picture looks very different. Vehicle exports averaged only 18.3 per cent of total exports for the years 1995-1996 but this share had increased to 56 per cent by 2012. Vehicles are high value added products and include a wide range of locally produced components. Secondly, while a substantial shift in the profile of exports has taken place over the last few years and the proportion of total exports accounted for by a small number of products has increased, it is not clear that this has all been in the direction of low value added components. Most notable among the growth of high value added complex components was the expansion of engines and engine parts, which by 2012 generated exports of R3.4 billion.

**Sustainability**

A second key question concerns the sustainability of the large fixed investments and export volumes established. Sustainability under a regime of falling assistance, is a function of cost factors such as labour, materials and logistics but also depends on more dynamic attributes such as scale of production (in relation to minimum efficient scale) and the rate of productivity improvement over time.

Even though the catalytic converter industry is capital intensive, this is in part due to high working capital requirements as a result of the high value of platinum group metals (PGMs), which are integral to the production process. Early investments in the sector gave the impression of being somewhat footloose. Only limited segments of the total production process were carried out in South Africa. Initial investment involved the establishment of plants, which undertook the coating and canning of the imported ceramic substrates. The pace of expansion increased following the signing of a number of very large contracts from 1999 to 2000 and by 2005 South Africa was producing approximately 14 per cent of total world supply. The industry reached sufficient critical mass to justify backward integration beyond the relatively simple coating and canning processes, with the two world leaders in ceramic substrates, Corning and NGK Insulators, establishing plants in South Africa to undertake the cutting and baking of the substrate. However, they failed to make the very large investments required for substrate production. In addition, there was significant investment in ancillary industries such as flexible connections, matt manufacture and manifold, exhaust system and silencer assemblies.

Automotive leather is a highly labour-intensive process and shares some of the attributes of the notoriously footloose garment industry. However, in this sector too, the value chain was increasingly embedded with the development of world class capabilities ranging from tanning of high quality leathers to JIT logistics. While exports remained substantial, they declined from R3.1 billion in 2008 to R1.7 billion in 2012. This was due to a number of factors. BMW and Mercedes Benz moved contracts to Eastern Europe even though the tanneries

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13 The visiting chief executive of a major carmaker referred disparagingly to them as “salami”.

14 Similar trends have been observed in other countries experiencing rapid international integration and export expansion such as Brazil (Posthuma 1995) and Argentina (Miozzo 2000).
there also source a proportion of their automotive wet blue grade hides from South Africa.\textsuperscript{15} Automotive policy issues also played a role. When the MIDP first came under scrutiny as an export subsidy under the WTO, it was the Australian government, under pressure from domestic producers of automotive leather, that first threatened to challenge the policy. While the APDP only came into effect in 2013, its basic parameters were clear some years earlier and affected investment decision-making, leading vehicle producers to diversify away from South Africa as a source. Under the APDP, vehicle and component producers earn production credits but highly export-oriented sectors of the component industry had support levels much diminished, even though they were included in the category of ‘vulnerable industries’.

\textbf{Investment}

The supply response to the realignment of domestic and international prices is a key variable determining the impact of liberalisation and this in turn hinges on investments made by firms. When imports are liberalised, it is possible that profit margins will fall in the short term and this could impact negatively on both the motivation and capacity to invest in the industry. While profits are declining in a more competitive market, there is clearly the risk of investment being reduced and gradual attrition taking place leading eventually to plant closure. However, the investment behaviour of the assemblers has been influenced by a number of industry-specific factors. The importance of economies of scale means that the increased competitive temperature places some pressure on firms to increase production as a way of reducing unit costs. This in turn may require that the parent company creates export opportunities for the South African subsidiary and invests accordingly. Investments have to be enlarged or firms face the prospect of losing market position and eventually becoming unviable. Thus the situation that faced the local assemblers and their parent companies in the mid to late 1990s was akin to a game of poker, where to stay in the game the stakes had to be increased.\textsuperscript{16} Given that the key investment decisions are made outside South Africa by the global parent, short term profitability in a minor South African subsidiary has been a lesser consideration than medium term market prospects and strategic concerns related to market share and the requirements of global production networks.

While inflows of foreign direct investment into the South African economy have been moderate during the tenure of the MIDP, the automotive sector has been a significant recipient. Much of this FDI involved the purchase of partial or full ownership by Ford (in Samcor), Toyota Motor Corporation (in Toyota SA), Nissan Motor Corporation (in Nissan SA) and General Motors (in Delta).

Fixed investment by vehicle manufacturers increased slowly after the trough of the mid-1990s, when political and policy uncertainty together with a weak domestic market led to a serious slump in new capital expenditure. All firms have modernised and expanded their plants and firms such as Toyota and Volkswagen which now have the capacity to produce at world scale. But as Figure 6 shows, in real terms there has only been a modest increase in investment in vehicle manufacture, apart from the spike in 2005-2006. In 2012 Rands, capital investment in 2010-2012 averaged R4.5 billion which is hardly an impressive increase on the low base of just over R3 billion for the first 3 years of the MIDP. The investments made in plants have continued to lag, both in a quantitative and qualitative sense, behind the massive investments that have been made in booming emerging market industries in Brazil, Thailand, China, India and central Europe over the last two decades.

\textsuperscript{15} This section draws on telephonic interviews with Dawie Bezuidenhout, JAG on Automotive Interiors (JALI), December, 2013.

\textsuperscript{16} At the time of TMC’s purchase of a 27.8% stake in Toyota (South Africa), Shinji Sakai a senior managing director of Toyota Motor Company stated that “since the freeing of South Africa’s economic system we are seeing more competition and we need to enhance our strength”. See Sunday Independent 13 October 1999
There has also been some expansion in investment in the component sector, while FDI has played an increasingly important role. While there have been a number of greenfield investments, the takeover of existing firms has accounted for a large share of FDI (Gelb & Black 2004). Since 2000, growing investment has taken place in first tier suppliers locating close to assembly plants with vehicle export projects, but many of these involve assembly-type operations with limited local content. As is the case with vehicle assembly, investment levels have been modest. South African Automotive Benchmarking Club (SAABC) data for the automotive components industry shows that average capital expenditure in the South African industry consistently lagged investment levels amongst international competitors from the late 1990s (Figure 7). Average investment levels breached six per cent of sales in only two years of the 15-year period, indicating consistently depressed levels of investment in the supply chain – even during the ‘boom years’ of the industry from 2001-2006.
Productivity, competitiveness and employment

Economic theory would attribute growing exports by multinational corporations from a developing economy such as South Africa, to efficiency-seeking FDI targeted at taking advantage of the comparatively low cost structure of the developing economy. Yet this was patently not the case under the MIDP. The boom in exports evident over the period of the MIDP was largely driven by the import-export complementation scheme, and hence by the strategic intent of exporting firms to earn sufficient import credits to offset their duty exposure in the domestic market. This does not mean that the South African automotive industry did not improve its competitiveness under the MIDP. The evidence for both vehicle assemblers and automotive component manufacturers is unequivocal in this regard. Automotive industry productivity in the early 1990s was very low in South Africa and improved rapidly. Data collected by the International Motor Vehicle Programme based on detailed assembly plant surveys conducted in 1994 and 1996 showed that the average South African assembly plant compared poorly with assembly plants in other countries. The main reasons for this were ascribed to low levels of automation and the complexity of most assembly plants, which produced a range of models in relatively low volumes. A crude measure of assembly plant productivity is to measure vehicle output per employee. This increased from 9.7 in 1995 to 14.5 in 2005 and 16.9 in 2012. At the same time, a number of South African assemblers, such as Mercedes Benz and BMW, have received international awards for the quality of the vehicles sold in export markets.

An important factor impacting on assembly plant productivity has been increased specialisation with a reduction in the number of models produced. For example, the number of passenger car models being domestically produced fell from 21 in 1995 to 12 in 2005 and seven in 2012. This was accompanied by a substantial increase in average model volumes, which in turn also encouraged higher levels of automation. Improved operational competitiveness drawing on lean production principles has also played a role (Black & Barnes 2003).

Data from the SAABC for automotive component manufacturers reveals a very similar picture. Whilst not strictly comparable from one year to the next due to constantly shifting participation in the SAABC, the average performance standard of automotive component manufacturers improved markedly over the period 1998/1999 to 2012 (see Table 5).

For each of the seven metrics analysed, the performance of the set of South African firms benchmarked annually improved markedly over the period. For certain Key Performance Indicators (KPIs), performance improved significantly. For example, customer return rates improved from 3,270 parts per million (ppm) in 1998/9 to 254 ppm in 2006 to 226 in 2012, an improvement of 93.1 per cent. Notwithstanding these improvements, the major competitiveness challenge for the South African automotive components industry over the duration of the MIDP appears to have been four-fold. First, the industry improved its performance off a weak base in the late 1990s. While it may have closed some of the gap on international performance standards by 2012, it remained some distance behind in certain performance areas. Examples of this in Table 5 below include customer return rates, internal scrap rates, and absenteeism. Despite improving by 93.1 per cent, 59.5 per cent and 31.8 per cent respectively from 1998/9 to 2012, South African performance standards lagged that of the international firms (located in India, Central Europe and North America) benchmarked in 2012 for the three measures.

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18 While these data provide a good estimate of productivity improvements they underestimate the number of vehicles produced per worker as they include only light vehicles but all employment, including in commercial vehicle production.
Second, the South African automotive industry’s international benchmarks have changed significantly over the duration of the MIDP. The automotive components industry has become fully internationalised over the last two decades. Multinational organisations with global production strategies now dominate the first two tiers of the automotive supply chain. They have the capability to discern the best locations for their new production facilities at a global level, and focus their investments on these locations. Mid- and high-cost production locations have lost out in the process. The only exceptions to this relate to instances where (a) the volumetric profile of components produced renders them expensive to trade across long distances; (b) sub-assemblies need to be supplied to vehicle assemblers on a Just in Time or Just in Sequence basis; or (c) trade barriers prevent the supply of the components across national economies. This internationalisation has resulted in an intensification of competitive pressure across the automotive supply chain, forcing price discipline and significantly improved performance across a range of critical non-price factors, such as inventory management, quality, reliability, flexibility, and innovation. In an ongoing review of the declining Australian automotive industry, by the government’s Productivity Commission, it is for example noted that the price of the Toyota Camry in the United States reduced by 1% per annum in real terms over the decade to 2010, while at the same time having $1,400 worth of additional safety, fuel efficiency, and quality improvements made to the vehicle (Productivity Commission 2013:17). These cost adjustments have been countered by a relentless search for savings in both assembly and component costs.

Third, several leading automotive producer countries in 2012 such as China, India and Thailand, did not feature as major global competitors in 1995. These economies have the advantages of large domestic markets, major regional market opportunities, cheap production costs and growing technological capabilities. In combination with the internationalisation of the automotive components industry, these economies have fundamentally changed the international automotive landscape. A recent comparison of the competitiveness of the South African and Thai automotive components industries from 2008 to 2013 (Barnes, Black & Tekachanont 2014)

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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost control</td>
<td>Inventory holding (operating days)</td>
<td>62.6</td>
<td>42.0</td>
<td>33.3</td>
<td>26.2</td>
<td>58.1%</td>
<td>24.5</td>
<td>-6.5%</td>
</tr>
<tr>
<td></td>
<td>Customer return rate (ppm)</td>
<td>3,270</td>
<td>1,240</td>
<td>254</td>
<td>226</td>
<td>93.1%</td>
<td>199</td>
<td>-11.9%</td>
</tr>
<tr>
<td></td>
<td>Internal reject rate (%)</td>
<td>4.9</td>
<td>3.9</td>
<td>2.6</td>
<td>1.7</td>
<td>65.3%</td>
<td>1.6</td>
<td>-5.9%</td>
</tr>
<tr>
<td>Quality</td>
<td>Internal scrap rate (%)</td>
<td>4.2</td>
<td>3.5</td>
<td>2.8</td>
<td>1.7</td>
<td>59.5%</td>
<td>1.5</td>
<td>-11.8%</td>
</tr>
<tr>
<td>Reliability</td>
<td>OTIF delivery reliability to customers (%)</td>
<td>92.2</td>
<td>92.7</td>
<td>93.5</td>
<td>97.7</td>
<td>6.0%</td>
<td>97.9</td>
<td>-0.2%</td>
</tr>
<tr>
<td></td>
<td>OTIF delivery reliability from suppliers (%)</td>
<td>78.7</td>
<td>82.2</td>
<td>90.0</td>
<td>92.5</td>
<td>17.5%</td>
<td>93.3</td>
<td>-0.9%</td>
</tr>
<tr>
<td>Human Resources</td>
<td>Absenteeism – lost hours (%)</td>
<td>4.4</td>
<td>4.0</td>
<td>3.3</td>
<td>3.0</td>
<td>31.8%</td>
<td>2.6</td>
<td>-13.3%</td>
</tr>
</tbody>
</table>

Sources: Barnes and Morris (2008), SAABC database, accessed January 2014
revealed the extent of the gap between the two countries. In spite of the fact that Thai employee costs were much lower, manufacturing standards were superior in areas such as cost control, quality performance and operational flexibility. In addition, Thai operating overheads such as electricity (3 per cent cheaper) and water (16 per cent) were lower than in South Africa. Only factory rentals were cheaper in South Africa (by 9 per cent).

Based on a model of a typical automotive component manufacturer in South Africa, the Thai operating cost advantage was calculated at 14 per cent, given the same levels of production output as evident in South Africa.

In a presentation given to the members (mostly automotive component manufacturers) of the Durban Automotive Cluster in 2013, Toyota South Africa management highlighted the magnitude of the change by identifying the cost challenges facing South African suppliers to Toyota. According to Toyota’s calculations, the average cost of their South African sourced components was 107-110 on their Cost Index of Manufacture (CIM) in 2013, with China at 91, India at 85 and Thailand at 92. Yet the performance of the ‘traditional’ competitors on Toyota’s CIM averaged 100 in Europe, much closer to average South African levels.

A further problem in South Africa has been the steep increases in factor costs. While the industry has become more efficient, and is operating closer to acceptable global operating standards, the input costs into operations have climbed steeply. This is evident for energy costs, municipal service costs (solid waste removal, water) and taxes, labour costs, skilled staff costs, and national government administered prices, such as port charges. In combination, these costs have rendered the automotive industry substantially less competitive than leading automotive producer countries such as Thailand (Barnes et al. 2014). The recent depreciation of the Rand will have reduced the gap to some extent.

Another major objective of the MIDP was to maintain employment during the process of restructuring. Total employment in the vehicle manufacturing industry (assembly and components) increased quite strongly from 104,100 in 1995 to 112,300 in 2005 and then declined to 100,159 in 2012. While cyclical factors, especially the impact of the global financial crisis, have an important effect on employment levels, assembly plant employment has declined significantly since 1995. A degree of rationalisation, as well as outsourcing of certain activities previously performed in-house, account for this.

TABLE 6: EMPLOYMENT IN THE AUTOMOTIVE SECTOR, 1990-2012

<table>
<thead>
<tr>
<th>Year</th>
<th>Assembly</th>
<th>Component</th>
<th>Tyre</th>
<th>Motor trade</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>38,600</td>
<td>65,500</td>
<td>11,000</td>
<td>178,000</td>
<td>293,100</td>
</tr>
<tr>
<td>1996</td>
<td>38,600</td>
<td>65,600</td>
<td>10,000</td>
<td>180,000</td>
<td>294,200</td>
</tr>
<tr>
<td>1997</td>
<td>37,100</td>
<td>69,100</td>
<td>9,500</td>
<td>180,000</td>
<td>295,700</td>
</tr>
<tr>
<td>1998</td>
<td>33,700</td>
<td>69,700</td>
<td>9,100</td>
<td>170,000</td>
<td>282,500</td>
</tr>
<tr>
<td>1999</td>
<td>32,000</td>
<td>67,200</td>
<td>6,670</td>
<td>175,000</td>
<td>280,870</td>
</tr>
<tr>
<td>2000</td>
<td>32,300</td>
<td>69,500</td>
<td>6,575</td>
<td>180,000</td>
<td>288,375</td>
</tr>
<tr>
<td>2001</td>
<td>32,700</td>
<td>72,100</td>
<td>6,300</td>
<td>182,000</td>
<td>293,100</td>
</tr>
<tr>
<td>2002</td>
<td>32,370</td>
<td>74,100</td>
<td>6,000</td>
<td>185,000</td>
<td>297,470</td>
</tr>
<tr>
<td>2003</td>
<td>31,700</td>
<td>75,000</td>
<td>7,200</td>
<td>191,000</td>
<td>304,900</td>
</tr>
<tr>
<td>2004</td>
<td>31,800</td>
<td>74,500</td>
<td>7,200</td>
<td>194,000</td>
<td>307,500</td>
</tr>
<tr>
<td>2005</td>
<td>34,300</td>
<td>78,000</td>
<td>6,800</td>
<td>198,000</td>
<td>317,100</td>
</tr>
<tr>
<td>2006</td>
<td>39,000</td>
<td>80,000</td>
<td>6,900</td>
<td>199,000</td>
<td>324,900</td>
</tr>
<tr>
<td>2007</td>
<td>38,300</td>
<td>81,800</td>
<td>6,800</td>
<td>201,000</td>
<td>327,900</td>
</tr>
<tr>
<td>2008</td>
<td>35,900</td>
<td>74,000</td>
<td>6,200</td>
<td>200,000</td>
<td>316,100</td>
</tr>
<tr>
<td>2009</td>
<td>30,100</td>
<td>61,000</td>
<td>5,700</td>
<td>203,000</td>
<td>299,800</td>
</tr>
<tr>
<td>2010</td>
<td>28,128</td>
<td>65,000</td>
<td>6,600</td>
<td>200,000</td>
<td>299,728</td>
</tr>
<tr>
<td>2011</td>
<td>28,147</td>
<td>68,500</td>
<td>6,500</td>
<td>200,000</td>
<td>303,147</td>
</tr>
<tr>
<td>2012</td>
<td>30,159</td>
<td>70,000</td>
<td>6,500</td>
<td>200,000</td>
<td>306,659</td>
</tr>
</tbody>
</table>

*Sources: NAAMSA Annual Reports (various years); Automotive Export Manual (various years)*
There has also been significant rationalisation of sections of the component sector. Greater specialisation within firms in many cases led to job losses. A typical scenario would be the replacement of multiple lines using labour-intensive methods with more automated and specialised production of a lower number of products. However, South African component suppliers have in many cases retained their flexible, low volume capacity in aftermarket production. In the component sector, where there have been declines in employment in ‘traditional’ suppliers, the rapid growth of exports has had a positive impact on employment especially in labour-intensive sub-sectors such as automotive leather and wiring harnesses. However, the problems in the automotive leather sector over the last decade have adversely affected employment in a sub-sector that at its peak employed several thousand workers. The largest component export sector, catalytic converters, is highly capital-intensive and generates relatively few jobs in relation to the huge volume of output. The tyre sector has been extensively rationalised and employment has declined sharply.

It is important to note that the motor trade (servicing, distribution) employs many more people than manufacturing. This has grown over the period, along with increasing car sales and a larger vehicle population. Lower vehicle prices, partly as a result of trade liberalisation, have also played a role.

The transition to the Automotive Production and Development Programme

The 2007-2008 review of the MIDP, which led to its termination in 2012, and the subsequent establishment of the APDP in 2013, was shaped by three streams of government and broader stakeholder concerns. The first related to the MIDP’s potential challenge at the World Trade Organisation, with at least two national governments raising questions as to the status of the MIDP in respect of South Africa’s compliance with the WTO Agreement on Subsidies and Countervailing Measures. It was broadly accepted by all stakeholders that the MIDP was a potentially actionable subsidy, and that formal action against the MIDP was likely within the WTO unless its termination was announced and a more compliant policy framework created. Second, the distortions of the MIDP, which were principally created through the materials-inclusive calculation of export-based benefits, were of major concern to government, NUMSA and NAACAM. Low local content levels in exported vehicles were largely attributed to the ease of earning import credits through the export of ‘peripheral’ components such as catalytic converters. Correcting these types of unintended MIDP consequences was a major objective of the review process.

The brief of the 2007/2008 review was therefore to replace the MIDP with a WTO-compliant development programme in 2013 that corrected the market and associated production distortions of the MIDP, and that was of similar overall benefit to the South African automotive industry. The 2007/2008 review was riven with tension from the outset. A number of the vehicle assemblers were in the process of planning the replacement of their locally manufactured models and demanded confirmation of government support prior to finalising the extent of their investments. This led government to provide verbal guarantees to the industry in respect of support levels post-2012. These guarantees were then used to influence the review process. The recommendations put forward by the review committee allowed for ongoing support for investment through the Productive Asset Allowance (now the Automotive Investment Scheme), replacing the domestic market only DFA with a market-neutral Volume Assembly Allowance (VAA), and implementing a WTO-compliant, market-neutral Production Incentive in place of the export-oriented IRCC scheme.

The recommended architecture of the APDP was largely accepted by the industry, although intensive lobbying then took place to upwardly adjust the proposed levels of support within each of the areas included within the new programme. As a result, significant changes were made to the final programme. This included an increase in the VAA from a recommended 15 per cent to 20 per cent, the inclusion of certain standard materials in the calculation of value addition through domestic supply chains (such as platinum, leather and non-ferrous metals), and the declaration of certain component manufacturing sub-sectors as ‘vulnerable’ and therefore
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The standard applied rate of the Automotive Investment Scheme also increased. The adjustments made were meant to ameliorate the costs associated with the transition of the industry from the MIDP to APDP operating environment, but they provided additional support in the form of Import Rebate Credit Certificates (now called Production Rebate Credit Certificates) that again make it far too easy to import vehicles into the South African market.

The APDP, which became operational in January 2013, is therefore only partly aligned with the factors that drove its establishment. While it is more aligned with the rules of the WTO, some of the distortions of the MIDP were not decisively dealt with (evident in the recognition of certain standard materials as local value addition), while the benefit afforded to the industry is potentially too generous, resulting in the continued expansion of vehicle imports which incur minimal duty, and limited pressure on vehicle assemblers to increase their local content levels.

5. CONCLUSIONS AND POLICY IMPLICATIONS

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

The period 1995-2012 has been a phase of rapid change. This paper has sought to assess how policy has impacted on industry structure and how this process has been mediated by the strategic decision-making of foreign and domestic firms. The long term performance indicators presented suggest a fairly positive development picture given the fact that the industry has been located in an underperforming economy. To date the costs of liberalisation have been quite low. The share of imports has grown sharply but there has been a very rapid increase in exports of both vehicles and components. Investment, including foreign investment, has increased, albeit at a modest pace. Significant rationalisation has reduced the extreme proliferation of makes and models being assembled in very small, uneconomic volumes. While there has been some employment loss, the automotive sector has not fared badly compared to manufacturing as a whole. Vehicle prices have also declined in real terms although they remain higher than in most first world markets. Quality and productivity have improved significantly. Thus, although the sector remains assisted, its structure is more robust, more competitive and more oriented to global markets.

However, policy has also produced distortions, encouraged uneconomic investments and led to unforeseen side effects. These impacts limit the gains that have been made and have caused complications in the transition process to the APDP. One of the most striking changes has been the rapid growth in exports and imports. The level of export assistance has been far too high, especially at the start of the MIDP. The orientation of the industry changed fundamentally away from its focus on the small domestic market. In fact it became ‘ultra-export oriented’. Growing exports facilitated specialisation and the achievement of economies of scale. But as yet this has had only a limited effect in terms of increasing ‘economic’ local content. More evident, especially in the early stages, was the expansion in exports of ‘peripheral’ components. The result was the growth of a large component export sector, which was not integrated with the low volume, low local content assembly industry supplying the domestic market. Another important effect of rapid export expansion was the increasing ability to rebate import duties, which added significantly to import pressure on the industry.

Greater international integration has led to growing foreign investment and ownership. The assembly sector is now completely foreign owned as is a large portion of the component sector. Foreign ownership has facilitated access to global networks. With few exceptions, domestically owned component firms neither possessed

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20 This is a relative term as a number of countries export a greater share of their automotive production. It refers to the orientation of the trade regime and the fact that, as a result of the MIDP, South Africa exports a high share of output given its remote location.
the technological capability to become independent first tier suppliers nor had ambitions in this direction. Many have been forced to reposition themselves as second tier suppliers, but may have gained from being reintegrated into the supply chain with much higher volumes.

The investments now being undertaken are generally on a larger scale than was the case previously and the industry is in a stable position with tariffs no longer declining under the APDP. Nevertheless, investments have in fact been quite modest in relation to most other major developing country vehicle producers. It is clear that there has been a substantial hedging of bets, for example, in the initial reluctance to make major investments in the assembly sector. It is apparent too, in the somewhat footloose nature of investments in key component export sectors such as automotive leather and catalytic converters. The supply chain remains underdeveloped and heavily reliant on imports. Essentially, the evidence presented here does not indicate that South Africa is en route to becoming a major new production hub or export platform for the global automotive industry.

There are a number of lessons for industrial policy:

1. **The industry was liberalised too rapidly:** A growth in imports was expected and was absolutely necessary to increase competition in the domestic market, as well as to allow for specialisation by domestic producers. However, it was too rapid and too extensive and this has undermined the prospects of the industry. This was not so much a problem of tariffs being lowered too far but more the result of the ease with which import duties could be offset.

2. **Long term, credible incentives impact on firm behaviour:** The establishment of a clear and transparent incentive structure encouraged multinational firms to make large, long term investments. Before long, this formerly decrepit industry was exporting luxury cars to Japan. One lesson is that an appropriately designed incentive structure can be used to encourage more employment-intensive growth in the manufacturing sector.

3. **Policy changes should be predictable and gradual:** Long term policy certainty is of extreme importance to investment decision-making. Gradual policy changes are necessary because firms have fixed investments and cannot adjust overnight. The export incentives under the MIDP were too generous and led to a dramatic and sometimes costly shift from import substitution to an ultra-export orientation. This then contributed to a more rapid increase in imports than expected.

4. **Intervening to affect market outcomes has its place but requires a solid rationale:** More prescriptive measures should have been used to encourage model rationalisation. However, dis-connections between policy-induced and market-based outcomes can lead to adverse distortions and side-effects.

Finally, where does this leave the industry with regard to future policy support? Should government continue to support the industry and if so, on what basis and for what reason? It is argued that the MIDP has cost the South African government (and hence taxpayers) many billions of Rands. Why not reduce protection further and transfer support to more deserving sectors? After all, vehicles have been assembled in South Africa for nearly a century and the sector can hardly be characterised as an infant industry. Furthermore, there is little evidence to date that South Africa is becoming an export hub.

These questions must be answered and it is difficult to argue the case for ongoing high level support without providing an explanation of how greater dynamic comparative advantage might be developed and the gap reduced in relation to low-cost rival producer countries. In this regard, three major points can be made.

1. **The level of assistance provided to the industry is frequently overstated and in any event was greatly reduced under the MIDP.** The MIDP itself was a significant policy reform, with its support levels and tariffs declining substantially from 1995 to 2012. The figures put out by National Treasury of budgetary assistance to the extent of R8 to R10 billion per annum are simply incorrect. They are based on South African Revenue Service (SARS) data on the import duties offset by exporting. However, if duties were not offset, imports would clearly be much lower. The ability to offset duties moreover reduced costs and increased imports. Consumers received access to lower cost vehicles and much greater choice. It is the view of the authors that the industry has been excessively liberalised in the sense that import
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Credits were too easily earned under the MIDP. Making this more difficult would have curbed imports to some degree and been positive for automotive manufacturing and for the trade deficit. According to the Treasury calculus, this would amount to reduced support to the industry. While the industry is not competitive with the lowest cost producing countries, it is much more efficiently structured and competitive than it used to be. This is evident in the more efficient industry structure, in productivity and quality improvements, and in the modernisation of plants. All this has been achieved with minimal dislocation in major plant closures or employment losses.

2. The question remains as to what would enable the industry to catch up with the lowest cost producers. Historically, the main challenge to the South African industry has been its distance from major markets. South Africa has never constituted a viable ‘automotive space’ which requires either a large domestic market, proximity to such a market or membership of a regional grouping that collectively constitutes such a market. Africa is now the world’s fastest growing region and is also characterised by extremely low rates of vehicle ownership. Sales are growing dramatically even though a high percentage of these new additions to the African vehicle population are used imports, mainly from Japan. Projections for economic growth and the increase in the size of the middle class point to massive expansion in vehicle ownership over the next few decades. The question is where will these vehicles be produced? With appropriate industrial policy arrangements together with ongoing regional integration it is possible to envisage the emergence of new poles of growth for the automotive industry alongside South Africa in countries such as Nigeria, Kenya, Ethiopia and Egypt. Indeed, booming conditions in most of the countries to the north means that South Africa has suddenly become well located as a production location for the last major untapped global market. If policy is appropriately managed there are considerable opportunities for long term growth.

3. The conditions for successful development of the automotive industry in developing countries remain the same as they always have been – a viable ‘automotive space’, ongoing improvements in competitiveness and the ability to attract investment and appropriate trade and other policies. With the booming market in the region, substantial efforts to improve competitiveness (both inside and outside the factory) and appropriate policies to regulate competition as well as existing links to the region, the South African automotive industry has the potential for unprecedented growth over the next few decades. All the attributes are in place – good infrastructure, established firms and production capabilities, affordable wages – and now the prospect of a booming regional market. Government and industry stakeholders need to work towards achieving this objective.
Manufacturing Led Growth for Employment and Equality

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SECTION 4
International experience

EMPLOYMENT AND EQUALITY IN NORTHERN IRELAND

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1. INTRODUCTION

Northern Ireland is known the world over for its sectarian conflict and thankfully has more recently become known for its processes of conflict resolution. Inequality, and especially employment inequality, was a key element of the conflict and the design and implementation of significant equality protections have been key elements of conflict resolution. The objective today is to outline the progress made on equality and in particular on employment equality and the factors which have contributed to progress. It is the author’s hope that the Northern Ireland equality journey will resonate with some of the issues of inequality in South Africa, and that some learnings will be of assistance as South Africa continues its work to bring about equality in labour market opportunity.

2. THE NORTHERN IRELAND JOURNEY FOR FAIR EMPLOYMENT LEGISLATION

Issues of employment inequality were at the heart of the Northern Ireland conflict. During the period of the local devolved government following the Division of Ireland from 1921 to 1972, complaints of religious discrimination against the Roman Catholic community in particular were a recurrent theme. In summary, the complaints were of inequality in jobs, housing and votes. In the late 1960s and 1970s, the complaints of employment inequality were given weight by analysis by academics and political activists, of the patterns in the labour market which suggested that there was discrimination against Catholics in both the public and the private sector. Importantly, a detailed analysis of the 1971 population census provided incontrovertible evidence of Roman Catholic labour market disadvantage, in both public and private employment. It was at this time when there were major outbreaks of civil disturbance that the local Northern Ireland government was suspended and the United Kingdom Government reinstated Direct Rule from London. Direct rule was accompanied by proposals to introduce comprehensive religious anti-discrimination employment legislation. This first employment equality legislation, which focussed on equality on grounds of religious belief/political opinion to reflect the two main ethno-religious communities, was introduced in 1976. At the same time Northern Ireland also introduced gender equality legislation and two commissions were established in 1976: the Fair Employment Agency and the Equal Opportunities Commission for Northern Ireland.

The 1976 fair employment legislation established the Fair Employment Agency. Although this Agency was similar to the Commission for Racial Equality and the Equal Opportunities Commission which dealt with gender equality, established in Britain at that time, there was one significant difference in its powers. The FEA was not required to have a belief of discrimination before it could begin an investigation. The Agency used this power to investigate large sections of the public and private sectors. Importantly, its investigation of the Northern Ireland Civil Service in 1983 found significant failures to implement the good practice recommendations which the Agency had designed. The report was a major shock given the stated commitment of the Civil Service to equality for all. The Civil Service quickly moved to implement comprehensive equality provisions and to encourage other public authorities such as District Councils, to do likewise.

A further important driver in the ongoing campaign for strengthened equality protections at this time (1980s) was the McBride Campaign. This was a United States-based group of Irish-Americans which urged American companies operating in Northern Ireland to adopt a series of principles, the McBride Principles. These were modelled on the Sullivan Principles applied to American employers in South Africa from 1977, following the appointment of Rev Sullivan, an African American preacher, to the Board of General Motors. The McBride campaign urged state and city legislatures in the United States to endorse the principles. Having endorsed the principles, these local legislatures pressurised companies operating in Northern Ireland to commit to the Principles.

An additional driver for stronger equality legislation was the evidence from the Fair Employment Agency investigations which frequently revealed Roman Catholic under-representation. The United Kingdom
government was also being pressurised to reform the equality protections by the Irish government following the mutually agreed Anglo-Irish Agreement and by the European Union. Furthermore a review of the existing provisions by the Government-established Standing Advisory Commission on Human Rights (SACHR) also concluded that extensive reform was required.

Of course there was also an economic rationale for an improved labour market as the operation of restrictive employment practices was not conducive to issues of productivity and growth. There was concern at this time that the reputation of Northern Ireland for unfair equality practice and for workplaces which were characterised by disharmony dissuaded foreign investors from setting up business in the area.

By the late 1980s it was apparent that major reform of the equality protections was necessary if substantive employment equality was to be achieved.

3. THE ACTIVE PRACTICE OF EQUALITY

When the UK government agreed to strengthen the employment requirements for equality on grounds of religion (1989), the legislation was strongly influenced by the Canadian Federal Employment Equity Policy. This incorporated rigorous monitoring of employees and although it permitted affirmative action, it did not incorporate quotas. The new Northern Ireland provisions required all employers, public and private, with 11 or more employees to monitor the religious composition of their employees, both full-time and part-time, and their applicants for employment. These equality protections which continue today are not just for Roman Catholics, who were traditionally under-represented, but apply to those of other religions as well as people of no stated religion. Jobseekers are asked the following question: “Are you a member of the Protestant community, the Roman Catholic community or Neither?”

Employers each year are required to send to the Equality Commission a monitoring return specifying the composition of the workforce by community background, gender and occupational grouping.

Since monitoring was first introduced in 1990, the vast majority of employees identify themselves as belonging to the Protestant or Roman Catholic community. Indeed the proportion of employees for whom it was not possible to determine a community background has only ranged from 5.6 per cent in 1990 to 7.0 per cent) in 2012.

Employers are also under a duty to determine if the composition of their workforce exhibits “fair participation”. In other words, each employer must ask themselves in light of all the known factors, such as the composition of those living in the reasonable Travel to Work Area, “is the composition of their workforce and of their recent recruits, as revealed by monitoring, broadly in line with what might reasonably be expected?” If the answer to this is “no” that is, one community is under-represented, then employers must adopt practices to encourage fair participation.

Employers cannot use reverse discrimination but can reach out to the under-represented community to encourage members of that community to apply for jobs. Employers can also provide training for those who are under-represented to capacitate them to apply for jobs.

These active equality duties were almost entirely accepted and adopted by employers. The new body, the Fair Employment Commission, was provided with additional funding and staff to assist employers to comply by providing guidance and support. It has only been necessary on rare occasions for the Commission to make use of its strong powers because employers were willing to make use voluntarily of the permitted affirmative action powers.

The provisions have achieved the desired outcome in that the Roman Catholic share has generally increased by 0.5 percentage points per annum since 2001 so that overall the religious composition of the workforce now accurately reflects the composition of those available for work.
The impact of the fair employment regime was the subject of detailed analysis by the Nuffield Foundation (2009). This concluded firstly that the monitoring and review provisions and the affirmative action agreements have been successful in that the overall composition of the workforce is now reflective of those available for work and, in firms in which affirmative action agreements were in place, there has been a shift towards employment equality. Secondly, the number of integrated workplaces has increased and the number of single identity workplaces has decreased.

A further important workforce change which followed the equality legislation was in relation to flags and emblems.

Before the 1989 legislation which provided for the active practice of equality, it was common for workplaces to have a large number of union flags and loyalist emblems on display. This was particularly so in the heavy engineering and manufacturing sector. This set the tone of ‘our place’ for the Protestant workers and left Roman Catholic workers in no doubt that the workplace was primarily for Protestants. There were also some workplaces where symbols of Catholic and Nationalist culture were overriding.

The Equality Commission’s Code of Practice required employers to promote a good and harmonious working environment. This was defined as an atmosphere where no worker feels under threat or intimidated because of his or her religious belief or political opinion. With this advice behind them, employers worked with employee representatives and trade unions to get flags down. Workplaces are now almost always free of flags. Furthermore, the structures put in place to deal with flags has also given many employers the confidence to ban sexually explicit posters, amongst others. Irrespective of the working environment, it is strongly recommended that every employer gives consideration to the question: ‘Does the workplace display an harmonious environment or does it make a member of a minority group feel isolated rather than welcome?’

At the level of the firm in Northern Ireland, there are notable examples of how the employment compositions have changed. One of the largest manufacturing companies in Belfast is the Canadian-owned Bombardier Aerospace manufacturer. The company’s largest site is situated in East Belfast, an area where the indigenous residents are primarily Protestant. The change in its workforce composition is as follows:

<table>
<thead>
<tr>
<th></th>
<th>Protestant</th>
<th>Roman Catholic</th>
<th>N/D</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shorts plc 1991</td>
<td>7363 (87.6%)</td>
<td>1044 (12.4%)</td>
<td>240</td>
<td>8647</td>
</tr>
<tr>
<td>Shorts Bros plc 2012</td>
<td>3947 (82.9%)</td>
<td>815 (17.1%)</td>
<td>214</td>
<td>4976</td>
</tr>
</tbody>
</table>

This company has an active employment equality programme and engages in significant activity to encourage Catholic apprentices. Since 1991 the Roman Catholic share of the workforce has increased from 12 per cent to 17 per cent.

An indigenous carpeting manufacturer, Ulster Carpets (which also has a factory in Durban, South Africa) is located in an area which is not welcoming to Roman Catholics, but has nevertheless increased its Roman Catholic share of the workforce by its affirmative action programme, from 7 percent in 1992 to 18 percent in 2012 despite a fall in overall employee numbers as a result of mechanisation. This company is an award-winning company including Exporter of the Year and an award for Best Place to Work. For this company, the equality journey was another improvement initiative.

<table>
<thead>
<tr>
<th>Ulster Carpets</th>
<th>Protestant</th>
<th>Roman Catholic</th>
<th>N/D</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992</td>
<td>562 (92.9%)</td>
<td>43 (7.1%)</td>
<td>-</td>
<td>605</td>
</tr>
<tr>
<td>2012</td>
<td>232 (82.0%)</td>
<td>51 (18.0%)</td>
<td>13</td>
<td>296</td>
</tr>
</tbody>
</table>

Compulsory religious monitoring, in addition to making it possible to clearly see the change in individual workplaces, has also enabled the scrutiny of sectors and the communities as a whole. It is still the case that Roman Catholics are under-represented in the security industry (police and army) and increasingly Protestants
are under-represented in areas of public sector employment, especially in health and education. A specialist study of mobility found that compared to the patterns a generation ago, religion no longer independently influences life chances. This is an important conclusion.

The Equality Commission has also sought to use a number of novel mechanisms to promote equality and one such is the use of social clauses in public procurement contracts. For example, a contract that will lead to new employment could also include a clause that the long term unemployed from the local community get the jobs. This is not in any way unique to Northern Ireland and the European Union in particular has for some time been very interested in the benefits of socially responsible procurement. The Equality Commission Northern Ireland (ECNI), along with the Central Procurement Directorate, jointly published guidance encouraging public procurement officials to integrate equality and sustainability into the procurement process. The guidance was welcomed by many public authorities; however, in practice the Authorities have made limited use of the facility. When asked why, they report that they are concerned about how they could measure the outcomes of social clauses and also about how to incorporate the costs of social objectives. The most influential report on social clauses, *Buying Social Justice* by Professor Chris McCrudden, concludes that there is a clear need for further empirical research on the integration of social and economic clauses.

One further equality protection in Northern Ireland is the ‘Public Sector Equality Duty’. This is a mainstreaming duty which has the aim of changing the practice of government and public authorities so that equality and good relations are central to policy making, policy implementation and service delivery. Although these public sector duties are not of direct relevance to manufacturing, they indicate the extent to which issues of equality now drive Northern Ireland. These mainstreaming duties have now been in place since 1999 and require public authorities to have due regard to equality of opportunity and regard to good relations.

4. NORTHERN IRELAND: THE ONGOING CHALLENGES

Segregation

Northern Ireland’s religious communities remain largely divided. The equality legislation in Northern Ireland is extensive in terms of the grounds it covers: discrimination is unlawful on grounds of religion, gender, race, disability, sexual orientation and age and it is intensive in that it makes discrimination unlawful not just in the context of employment and training, but also in respect of the provision of goods, facilities and services. There can be no doubt about the impact of legislation which outlawed discrimination. However, despite the very significant revision to workplaces which are much more integrated in terms of religious composition, there is still considerable segregation of the Protestant and Roman Catholic communities in housing, in schools and colleges, and in social activities such as sport. The success in achieving a resolution to a thirty-year long conflict (the Good Friday Agreement of 1998) has been hailed the world over. However the religious/political divide remains and the people of Northern Ireland continue to seek a resolution to the issues of Flags, Parades and the Past. The United States Special Envoy, Richard Haas, recently invested considerable time and effort in trying to resolve these matters but thus far they remain unresolved. The ECNI is currently working with the Northern Ireland Government Executive to increase the responsibilities of the Commission to henceforth include responsibilities for the encouragement, promotion and measurement of good relations and thereby improve the context for a Shared Future.

Education

The Northern Ireland school system is largely divided. There are two main school systems, the Catholic-maintained, which is very largely for Catholic students, and Controlled schools which are very largely attended by Protestant students. There are a small number of integrated schools which serve both Protestant and Roman Catholic students comprising about 7 per cent of all school students. At second level, that is from 11 years of age
upward, most children transfer from “all ability” primary schools to selective second level schools. The selection is by test which children complete at 11 years. This results in a quite significant division based on social class.

Success in academic attainment is significantly influenced by religion, gender and class, where,

- In terms of religion, Catholic schools outperform state schools
- In terms of gender, girls outperform boys
- In terms of class, wealthier children (not on free school meals) outperform poorer children.

The interplay of these three influences results in Protestant boys from poorer backgrounds doing less well in terms of educational outcomes. In later years, the likelihood is that they will be economically inactive or unemployed. There is increasing concern about the attainment gap between the religious communities and the potential for this to impact on employment chances in the future.

**Poverty and the Recession**

Northern Ireland in the last 5 years has experienced a considerable recession with a significant drop in manufacturing and the almost complete collapse of the housing market. Poverty has increased in Northern Ireland on all the measures. For a considerable number of years the rate of unemployment, that is those without work and looking for work, was low but the rate of economic inactivity, that is those without employment and not seeking work, was much higher. Government across the UK has implemented a major programme of welfare reform which, by reducing out-of-work benefits, aims to encourage people back to work. The impact of welfare reform is expected to be greater in Northern Ireland than in any other region of the UK mainly due to the high dependence on disability benefits, and it is these benefits which are the UK Government’s main target for reform. Northern Ireland is thus likely to encounter increased poverty in the next few years.

**Employment Inequalities**

As previously mentioned, for the past decades the Northern Ireland labour market has moved towards greater equality between Protestants and Roman Catholics. A notable distinction is that there is a younger age structure in the Catholic community than in the Protestant community so that the majority of applicants for employment are Catholic, while the majority of those leaving employment and retiring are Protestant. For many years (especially in the 1980s) the unemployment rate of Roman Catholics was much greater than that of Protestants (21 per cent v 8 per cent) but this is no longer the case and the most recent figures show that currently in the 16 to 24 age band 24 per cent of Protestants were unemployed in 2012 compared to 17 per cent of Catholics. There is a particular concern that young Protestant males with low academic qualifications are NEET, that is, not in education, employment or training. Research suggests that these are the people more likely to be unemployed and welfare-dependent in later years, to earn less, to suffer ill health and to become involved in antisocial behaviour. It is this group which are the subject of the employability initiatives mentioned earlier.

**5. CONCLUSION**

There is no doubt about the significance of the labour market change which has been brought about in Northern Ireland. Strong equality legislation, effectively enforced and an economic and social context in Northern Ireland which was favourable to change were all drivers for this revision. Of course there are ongoing and newly emerging challenges including such matters as a greater focus on issues for disabled people, concerns about labour market access and social isolation of recent migrant workers from the extended European Union and the ever-present concern in terms of social class. Working with others to reduce these continuing socio-economic inequalities remains a central challenge for the Equality Commission for Northern Ireland.
A PVAR APPROACH TO THE MODELING OF FDI and spill overs effects in Africa

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Abstract

The focus of this study is to investigate whether foreign direct investment (FDI) inflows to Sub Saharan African countries generated productivity spillovers for the period 1980-2010. This study methodologically departs from the existing studies as it uses a dynamic vector autoregressive model (PVAR) that ensures the dynamic behaviour of the panel series under consideration is properly captured, while simultaneously catering for endogeneity and causality issues. Any feedback and indirect effects which might be present will also be detected within the PVAR. The results show that FDI is an important element in the TFP growth model as evidenced by the positive and significant effect on TFP growth. This result is confirmed by the impulse response function analysis. Results from the analysis indicated the presence of a bi-directional causality between TFP growth and foreign direct investment. Indeed, although FDI induced a positive impact on TFP growth, openness was also seen to be an important determinant of TFP growth. The PVAR approach has also enabled the authors to conclude that human capital, openness, TFP growth as well as high technological gap taken together are important determinants of FDI for the sample of countries used.
1. INTRODUCTION

Over the past decade, FDI has acquired considerable importance as a tool for the economic development of host countries and for accelerating their growth. As such, inward FDI boosts aggregate investment and the level of economic activity, thereby giving positive signals as to the soundness of the host economy. Besides, FDI has numerous benefits which include employment creation, improved productivity, enhanced exports, and technological and knowledge transfers.

The significance of FDI lies in its primary difference from other forms of capital investment. In fact, empirical evidence suggests that FDI flows are relatively less volatile as compared to other capital flows (IMF, World Economic Outlook, 2007). Hence, it entails a longer duration of commitment (Barrell & Holland 2000). The aim behind FDI is to form pan-commercial relations, while exerting significant managerial control over the foreign firm. Therefore, FDI consists of a combination of capital, technology, managerial skills, market access and entrepreneurship (Dunning 1993). The numerous benefits derived from FDI have generated much interest among policymakers as regards the potential impact of foreign direct investment and policies which would affect FDI flows. Moreover, evidence suggests that, given specific country prerequisites, FDI indeed results in better growth outcomes (Borensztein, de Gregorio & Lee 1995, Alfaro 2003). Attracting foreign direct flows also ranks high on the agenda of African countries in view of the accompanying wide-ranging benefits. Nevertheless, over the last few years, with the advent of the global financial crisis, such flows to Africa have been constantly on the decrease with remittances to Sub Saharan African countries unfortunately decreasing. Nonetheless, FDI is and remains a crucial ingredient which facilitates the flow of capital as a result of which there is broad-based growth and an upgrading of human capital and it is still perceived to be one of the most effective tools in the fight against poverty. In addition, it is extensively argued in the literature (Bosworth & Collins 1999) that the ability to attract foreign capital can offer potentially large benefits for developing countries in terms of growth prospects, employment and technological progress. Of all forms of capital flows to developing countries, Foreign Direct Investment is viewed as the most stable component, owing to the nature and duration of the commitment it involves (Barrell & Holland 2000).

Unsurprisingly Sub Saharan African countries have placed much emphasis on devising measures to attract FDI since the latter is often regarded as a source of economic prosperity above all other potential benefits. For instance, Mlachila and Takebe (2011) highlights that investment from the emerging powers mainly sought natural resources, but is now increasingly diversifying into agriculture, manufacturing and service industries (for example, telecommunications) which thus enhances the potential for technology transfers and increasing productivity, playing an important role for economic growth in non-resource-rich countries.

However, although the literature provides many studies analyzing the impact of FDI and technology transfer at the micro level, it could be argued that only a few studies such as Woo (2009) and Alfaro and Rodriguez-Clare (2009) have so far investigated the relationship between FDI inflows and productivity growth at the macro level. In this regard, the paper attempts to fill this gap and aim at contributing to the literature by investigating the extent to which FDI contributes towards total factor productivity in the case of Sub Saharan African countries. Seventeen countries were been selected based on the availability of data. The paper innovatively uses a dynamic vector autoregressive model (PVAR) to carry out the analysis; as such a framework encapsulates the dynamic behaviour of the hypothesized link in a panel setting, while simultaneously catering for endogeneity and causality issues. Any feedback and indirect effects which might be present will also be detected within the PVAR.

The structure of the paper is as follows: A review of the literature is presented in the next section, followed by the methodology used in the study. The econometric analysis and findings are presented in section 4. Section 5 concludes the study by summarizing the findings and presenting some policy implications.
2. LITERATURE REVIEW

FDI has been considered by policy makers as an important contributor to growth through different channels. They upsurge the capital stock and employment, stimulate technological change through technological diffusion and generate technological spillovers for local firms. Since it facilitates the transfer of technology, foreign investment is expected to increase and improve the existing stock of knowledge in the recipient economy through labour training, skill acquisition and diffusion. FDI is also expected to introduce new management practices and more effective organization of the production process. Hence, FDI increases not only the productivity of firms which receive these investments, but potentially on all host-country firms (Rappaport 2000). In the review of the literature, emphasis is laid on the impact of FDI and technology transfer and the relationship between FDI and economic growth and productivity.

FDI and technology transfer

Technology transfer by foreign affiliates has been identified as a key factor to boost the economic growth of the host country. Whilst there is a lot of focus on technology transfer in past studies, it is argued by Lall (1996) that knowledge is of paramount importance for competitiveness at both micro- and macro-level. Host countries, especially developing economies, aim to foster indigenous technological capabilities, that is “skills - technical, managerial and institutional - that allow productive enterprises to utilize equipment and technical information efficiently”. It is often argued that the more difficult task is the transfer of more complex capabilities, such as skills to assess available technologies and to select the most suitable ones, or the managerial skills to improve organizational arrangements. Such capabilities are often tacit. Transfers of such knowledge are subjected to various forms of market failure.

Hummels and Stern (1994) concludes that the lion’s share of FDI occurs among nations with similar technology and human capital levels. Depending on the economy’s actual growth level, technical progress and growth can be based on the creation of entirely new knowledge, or adaptation and transfer of existing foreign technology. Since it is less costly to learn to use existing technology than to generate new technology, developing countries have the potential to grow faster than developed economies for any given level of investment or Research & Development spending. However, this potential for convergence is conditional upon the economy’s level of human capital. More specifically, as discussed by Van den Berg (2001), it is the quality of the labour force, its accumulated experience and human capital, its education system among others that determine an economy’s ability to create new ideas and adapt old ones. Consequently, improvements in education and human capital are essential ingredients for absorbing and adapting foreign technology, and to generate sustainable long term growth.

Given the above, it can be safely argued that FDI contributes to economic growth through technology transfer and this is done through various channels. For instance, there may be a direct transfer, that is, by parent companies to their foreign affiliates or indirectly to domestically owned and controlled firms in the recipient country (Blomstrom et al. 2000, UNCTAD 2000). In this regard, spillovers of advanced technology from foreign-owned enterprises to domestically owned enterprises can take various forms:

- through vertical linkages between foreign affiliates and local suppliers and consumers;
- through horizontal linkages between the foreign affiliates and firms in the same industry in the recipient country;
- through turnover of labour from affiliates to domestic firms; and
- through internationalization of R&D (Hanson 2001, Blomstrom & Kokko 1998).

1 Ibid
As postulated by Carkovic and Levine (2002), the degree to which technological change will occur in the economy as a whole will depend on the innovative and social capabilities of the host country, together with the absorptive capacity of other enterprises in the country.

Another strand of the literature by Jordaan (2012) propounds that FDI firms are more involved than domestic firms in various knowledge transfer activities and activities with a direct positive impact on production processes of the local suppliers. Thus, suppliers of FDI firms are more likely to experience large positive technological improvements. Furthermore, their analysis shows that a large technology gap between FDI and local suppliers fosters rather than hinders this positive impact among local suppliers of material inputs.

Spillover effects can also be observed in the labour markets through learning and its impact on the productivity of domestic investment (Sjoholm 1999). Sjoholm suggests that through technology transfer to their affiliates and technological spillovers to unaffiliated firms in the host economy, transnational corporations can speed up development of new intermediate product varieties, raise the quality of the product, facilitate international collaboration on R&D, and introduce new forms of human capital. Das (1987) and Findlay (1978) observe that an important feature of early theories of technological diffusion is the assumption of costless transfer of technology from foreign firms to local firms. However, there might be costs associated with transferring technology from the parent company to its subsidiary, and learning investment from native firms. In line with this concept, Wang and Blomstrom (1992) argues that the rate and modernity of technology transfer through multinationals is positively related to the learning investment of native firms. This has a very important implication in that unless domestic firms are devoting enough resources and efforts to learn multinational’s technology, the latter will be transferring to their subsidiaries outdated technologies at a slower rate.

The literature includes not only studies depicting a positive relationship between FDI and technology, but also studies which suggest that foreign investment can have a negative impact on the direct transfer of technology, and thus reduce the spillover from FDI in the host country in several ways. For instance, they can provide their affiliate with fewer technological capabilities, or even limit access to the technology of the parent company. The transfer of technology can be prevented if it is not consistent with the MNC’s profit maximizing objective and if the cost of preventing the transfer is low. Consequently, the production of its affiliates could be restricted to low-level activities and the scope for technical change and technological learning within the affiliate will be reduced. This may be achieved by limiting downstream producers to low value intermediate products, and in some cases “crowding out” local producers to eliminate competition. They may also limit exports to competitors and confine production to the needs of the MNCs. These may ultimately result in a decline in the overall growth rate of the host country and a worsened balance of payments situation (Blomstrom and Kokko 1998).

**FDI, economic growth and productivity**

Neoclassical economists argue that FDI influences economic growth by increasing the amount of capital per person. In this regard, Abdulhamid et al (2011) studied the effect of FDI on economic growth in Sub Saharan Africa using panel data 1975 to 1999 and they concluded that FDI positively influenced economic growth and that domestic investment, trade openness and macroeconomic policies adopted also have a positive effect on growth. According to Bengos and Sanchez-Robles (2003), FDI is evidenced to positively influence economic growth, but recipient countries require minimum human capital, economic stability and liberalized markets in order to benefit from long term FDI inflows. However, the empirical evidence provided by Bende-Nabende et al. (2002) demonstrates that the direct long term impact of FDI on output is significant and positive for comparatively economically less advanced Philippines and Thailand, but negative in the more economically advanced Japan and Taiwan. Hence, the level of economic development may not be the main enabling factor in FDI and growth nexus. On the other hand, the endogenous school proponent supports the view that FDI also influences long term variables such as research and development (R&D) and human capital (Romer 1986, Lucas 1988).

In addition, other studies have shown that foreign direct investment could be beneficial in the short term but that this may not necessarily be the case in the longer term. Durham (2004), for example, could not find
a positive relationship between FDI and growth, but instead suggests that the effects of FDI are dependent on the absorptive capability of recipient countries. Obwona (2001) notes in his study of the determinants of FDI and their impact on growth in Uganda that macroeconomic and political stability and policy consistency are important parameters determining the flow of FDI into Uganda and that FDI affects growth positively but insignificantly. Furthermore, political regime, real income per capita, rate of inflation, world interest rate, credit rating and debt service explain the variance of FDI in Nigeria (Ekpo 1995).

There is consensus in the literature that FDI increases growth through productivity and efficiency gains by local firms. However, the empirical evidence tends to suggest otherwise. Several papers including Globeram (1979) and Imbriani and Reganeti (1997) have argued that developed countries seem to support the idea that the productivity of domestic firms is positively related to the presence of foreign firms. However, the results for developing countries are mixed at best, with some suggesting positive spillovers (Blomstrom 1994, Blomstrom and Sjoholm 1999) whilst others such as Aitken et al. (1997) and Saqib et al. (2013) report limited evidence. Alternatively, some studies found no evidence of positive short term spillover from foreign firms.

Some of the underlying motivations which could explain such mixed results have been provided by Aitken et al (1999) who suggests that the envisaged forward and backward linkages may not necessarily be there and that arguments of foreign affiliates encouraging increased productivity due to competition may not be true in practice. Other reasons also include the fact that foreign firms tend to locate in high productivity industries and therefore could force less productive firms to exit (Smarzynska 2002). In addition, Cobham (2001) also discusses the crowding out of domestic firms which led to a contraction in total industry size as well as total employment. Furthermore, the role of FDI in export promotion remains controversial which depends crucially on the motive for such investment (World Bank 1998).

As reported by Blomstrom et al. (1994) FDI has a positive effect on economic growth, but this positive effect is conditional on the threshold level of income. In fact, for FDI to have a favourable effect on economic growth a minimum threshold level of income is required. The explanation was that only those countries that have reached a certain income level can absorb new technologies and benefit from technology diffusion, and thus benefit from the extra advantages that FDI can offer. Another strand of the literature specifies human capital as one of the reasons for the mixed evidence of FDI at different levels of income. This is because it takes a well-educated population to understand and spread the benefits of new innovations to the whole economy. Borensztein et al. (1998) also found that the interaction of FDI and human capital had important effects on economic growth, and suggests that the differences in the technological absorptive ability may explain the variation in growth effects of FDI across countries. Their paper also suggests that countries may need a minimum threshold stock of human capital in order to experience positive effects of FDI.

It is further observed that the relationship between FDI and growth is conditional on the macroeconomic dispensation the country in question is passing through. In fact, Zhang (2001) asserts that, “the extent to which FDI contributes to growth depends on the economic and social condition or in short, the quality of the environement of the recipient country”. This argument was also put forward by Mustapha et al. (2008). In essence, the impact that FDI has on the growth of any economy may be country- and period-specific, and as such there is a need for country-specific studies.

The growth effect of FDI does not win unanimous support. Several problems were identified in previous studies. The problems were mainly in the face of a crowding-out effect on domestic investment, external vulnerability and dependence, a possible deterioration of the balance of payments as profits are repatriated, destructive competition of foreign affiliates with domestic firms, and “market-stealing effect”. It is thus noted that the review of the literature on the impact of FDI on economic growth is far from being conclusive. As argued by previous studies, the role of FDI is more country-specific, and can be positive, negative or insignificant, depending on the economic, institutional and technological conditions in the recipient countries.
3. METHODOLOGY

The aim of this study is to investigate whether foreign investment contributes to augmenting total factor productivity of the host countries. Referring to earlier studies on FDI and spillover theory such as Findlay (1978) and Wang and Blomstrom (1992), it is assumed that FDI increases the efficiency of firms in host countries. However, the present study is dealing with FDI and spillover efficiency at the macro level, and therefore it is suggested that increased efficiency will lead to TFP growth.

The Sub Saharan African countries considered in this study are: Angola, Benin, Botswana, Chad, Congo, Ghana, Madagascar, Mozambique, Malawi, Mauritius, Senegal, Nigeria, Seychelles, Togo, Uganda, Zambia and Zimbabwe. The time period considered is 1980 to 2010.

4. MODEL SPECIFICATIONS

In light of the endogenous growth theories, FDI can affect growth of GDP per capita in the framework of both the neoclassical and endogenous growth theories. The main difference is whether the effect is temporary (as in the transition dynamics of neoclassical models) or permanent (as in the endogenous growth models). The latter can happen if FDI increases TFP through the various spillover effects associated with it. Therefore, estimating the effect of FDI on total factor productivity (TFP) seems preferable to testing whether or not FDI can serve as a source of endogenous growth.

Based on the principles of some earlier studies (Caves 1974, Globerman 1979, Blomstrom & Sjoholm 1999), the following functional form applies to the “productivity spillover model” used in this research:

\[
TFPG = \alpha_0 + \beta_1 FDI_{xt} + \beta_2 TG_{xt} + \beta_3 OPNS_{xt} + \beta_4 HC_{xt} + \beta_5 CPI_{xt} + \mu_{xt}
\]  

(1)

However, because of the variance stabilizing properties of log transformation, the log values of the variables are used. In fact, logged variables yield a more clear-cut interpretation of the coefficients in terms of percentage change.

Converting all the variables in logarithmic terms yields:

\[
LTFPG = \alpha_0 + \beta_1 LFDI_{xt} + \beta_2 LTG_{xt} + \beta_3 LOPNS_{xt} + \beta_4 LHC_{xt} + \beta_5 LCPI_{xt} + \mu_{xt}
\]  

(2)

Where \(LTFPG\), \(LFDI/GDP\), \(LTG\), \(LOPNS\), \(LHC\), \(LCPI\) are the logs of total factor productivity growth, foreign direct investment, human capital, technology gap, openness and consumer price index respectively. \(\beta_1 \ldots \beta_5\) represent the parameter estimates and \(\mu_{xt}\) is the random disturbance term.

Dependent Variable: TFP Growth

This study employs the new dataset for TFP developed by the United Nations Industrial Development Organization (UNIDO) World Productivity dataset. It is noted that most studies use the growth accounting methodology whereby the observed growth rate in GDP is decomposed into the growth of factor inputs and changes in production technologies. This method is used mainly because of the difficulty of measuring the productivity at aggregate country level. The measure of productivity obtained in this manner is what is commonly referred to as Solow-residual (Solow 1957) since it is the residual after the growth rates of inputs are deducted from the observed growth rate of GDP. However, this exercise suffers from various drawbacks such as problems in measuring labour and capital inputs and the assumption employed with respect to their prices, among others (Barro & Sala-i-Martin 2004).
The World Productivity database of UNIDO by Isaksson is developed in a way that overcomes the problems associated with the simple growth accounting methodology. For a complete technical description of the database, see Isaksson (2007).

**Independent Variables**

1. **Foreign Presence (FDI)**

   The degree of foreign presence is measured by the amount of inward FDI for each country in the sample. FDI is calculated by the World Bank as the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments. Caves (1974) suggests that FDI increases productivity via competition and technology transfer. Blomstrom (1986) confirms this suggestion using a sample of Mexican manufacturing industries. Thus, the larger the share of foreign ownership, the greater the potential for spillover. Consequently, the coefficient of FDI is expected to be positive and significant. The ratio of FDI to GDP is used as a proxy of foreign presence and accounts for country size.

2. **Human Capital (HC)**

   Reasonably, the educational level and skills of workers affect their productivity. Indeed, a higher level of human capital increases the ability of workers to learn and adopt new technologies faster and more efficiently. Schultz (1961), Becker (1964) and Mincer (1974) put forward that human capital has a direct relationship with workers’ productivity. Literacy rate, mean year of schooling, school enrolment rate, government expenditure on education, training and health often represent human capital. Conversely, Blomstrom and Sjoholm (1979) used the ratio of white to blue collar workers as a proxy for skill level. This study uses secondary school enrolment ratio as a proxy for human capital and a positive coefficient is expected.

3. **Technology Gap (TG)**

   In 1992, Kokko showed that technology gap between the local firms and MNCs constitutes a factor affecting FDI spillovers. Nevertheless, opinions as to the impact of TG are divergent. Some authors (Sjoholm 1999, Castellani & Zanfei 2003) argue that larger TG results in positive spillovers while others stipulate that it should be moderate (Findlay 1978) or small (Liu et al. 2000) so as to affect productivity positively. The relationship between the dependent variable and technology gap may be non-linear as seen in the empirical review. Furthermore, the sign of the gap coefficient may change depending on the local firm’s existing level of technological competence. As seen in Perez (1997) and in Kokko (1996), this relationship is captured by including the technological gap as another explanatory variable. The present study measures TG as the difference between the GDP of a particular country and the average GDP of all remaining countries in the sample.

4. **Openness (OPNS)**

   Trade openness is known as another control variable in growth regression. Openness to trade can give a country better access to technologies developed elsewhere and enhance their catching-up process through adaptation of advanced foreign technologies (Keller 2004). Using panel data and fixed effect approach for a group of 36 developing countries, Abizadeh et al. (2007) concludes that trade openness has a positive and significant impact on labour productivity. Common proxies for trade openness include ratio of exports plus imports to GDP, ratio of exports to GDP and ratio of imports to GDP. Following Loko et al. (2009), the ratio of exports plus imports to GDP is used as a proxy. The sign of the variable is expected to be positive.
5. Consumer price index as a measure of inflation (CPI)

Inflation is seen to decrease total factor productivity. As observed by Gillman et al. (2004) inflation can adversely affect the return on capital thereby reducing investments on capital which would ultimately reduce growth. Baltabaev (2014) argues that, “inflation can make prices a less efficient co-ordination mechanism, thus reducing the information content of prices, hinders the gains in productivity. High levels of inflation can also create more uncertainty and hinder innovation which reduces efficiency.” In line with this argument, the study of Bitros and Panas (2001) found that inflation reduces total factor productivity growth in two digit Greek manufacturing sector industries. Their results are both statistically and economically significant. Hence, there is an inverse relationship between inflation and TFP growth. Inflation is included as measured by consumer price index as another independent variable in the study.

5. ESTIMATION ISSUES

Before estimating the equation, it is important to test whether the variables are stationary or not and thus verify the time series properties of the data. Using the Im, Pesaran and Shin (2003) panel unit root test, it was found that the series are non-stationary at their level and stationary at their first difference at 5 per cent level of significance. This means that the series follows an I (1) process.

Endogeneity issues and the Panel Vector Autoregressive Model

Levine et al. (2000) argues that there might still be the possibility of the loss of dynamic information even in panel data framework as the dependent variable may have something to do in explaining itself as well. It is likely that there exists dynamic feedbacks and indirect effects among the variables in the TFP growth function. Including these feedbacks is essential to the modelling of the hypothesis. Where FDI can directly affect TFP growth, it may also have indirect positive impacts on the country’s productivity growth as it may affect other inputs in the productivity growth function. Furthermore, the productivity level of a country may also result in more inflow of FDI, thus resulting in reverse causation.

Given the possibility of endogeneity and causality issues, vector auto regressions (VAR) were used on panel data to enable the authors to consider the complex relationship that might exist between FDI and TFP growth. Moreover, Panel VAR also allows for a firm specific unobserved heterogeneity in the levels of the variables. Panel data vector auto regression combines the traditional VAR approach, which treats all the variables in the system as endogenous with the panel data approach, which allows for unobserved individual heterogeneity. A first order VAR model is specified as follows:

\[ Z_{it} = \Gamma_0 + \Gamma_1 Z_{it-1} + \mu_i + \varepsilon_t \]

Where \( Z_t \) is a Six variable vector \( (\text{tfpg, fdi, tg, hc, opns, cpi}) \) and the variables are as defined previously. Where \( i \) is used to index countries and \( t \) to index time, \( \Gamma \) are the parameters and \( \varepsilon_t \) is the error term. The lower case variables are the natural log of the respective upper case variables.
Estimation and Analysis

Table 1 presents the results from the PVAR estimation.

<table>
<thead>
<tr>
<th>Response to</th>
<th>Constant</th>
<th>tfpgt-1</th>
<th>fdit-1</th>
<th>hct-1</th>
<th>openst-1</th>
<th>cpit-1</th>
<th>tg t-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>TfpG</td>
<td>0.51</td>
<td>0.98***</td>
<td>0.12**</td>
<td>-0.39</td>
<td>0.17*</td>
<td>-0.02**</td>
<td>0.008*</td>
</tr>
<tr>
<td>Fdi</td>
<td>-1.82</td>
<td>0.25*</td>
<td>0.60***</td>
<td>0.51*</td>
<td>0.29*</td>
<td>-0.02*</td>
<td>1.35*</td>
</tr>
<tr>
<td>Hc</td>
<td>0.21*</td>
<td>0.06**</td>
<td>0.01</td>
<td>0.91***</td>
<td>-0.06</td>
<td>0.004</td>
<td>0.12</td>
</tr>
<tr>
<td>Opens</td>
<td>0.42*</td>
<td>0.12*</td>
<td>0.01</td>
<td>0.014</td>
<td>0.87***</td>
<td>-0.01</td>
<td>-0.11</td>
</tr>
<tr>
<td>Cpi</td>
<td>4.16</td>
<td>4.64***</td>
<td>0.04</td>
<td>-3.82**</td>
<td>0.68</td>
<td>0.45***</td>
<td>-1.14</td>
</tr>
<tr>
<td>Tg</td>
<td>0.13</td>
<td>0.07</td>
<td>-0.01</td>
<td>0.11</td>
<td>0.19*</td>
<td>0.03</td>
<td>1.06***</td>
</tr>
</tbody>
</table>

No of Obs  | 424      | 424     | 424    | 424   | 424      | 424    |
| No of Countries | 17 | 17     | 17     | 17    | 17       | 17     |

*significant at 10%, ** significant at 5%, ***significant at 1%

Table 1 is a composite table where each equation can be viewed and analysed as an independent function. For instance, of interest primarily is row 1 which is in fact TFP growth equation. It is observed that the coefficient of FDI is positive (+0.12) and significant. This suggests that FDI inflow has had a positive and significant effect on total factor productivity growth for this sample of Sub Saharan African countries over the years of study. In fact, it implies that a 1 per cent increase in FDI contributed to 0.12 per cent increase in total factor productivity growth. The results support empirical findings of Li and Liu (2005) and Woo (2009) which reveal positive and significant effects from FDI on income and TFP growth respectively. Channels through which such productivity spillovers occur include the demonstration effect, the competition effect, and through vertical linkages. However, the results are in contrast with the findings of Alfaro et al. (2004), Durham (2004) and Azman-Saini et al. (2010) who did not find any direct positive effect from FDI on growth.

Though the main objective of the paper is to investigate the link between FDI and TFP growth, the authors have attempted to establish the effect of other macroeconomic variables on TFP growth. The variable technology gap is also of interest. The relationship between the dependent variable and the technology gap may be non-linear as seen in previous studies. Also, the sign of the gap coefficient may change depending on the local firm’s existing level of technological competence. For instance, it is noted that the coefficient technology gap is positive and significant. This implies that apart from direct TFP enhancing effect of FDI, it is observed that TFP growth can further increase if the countries have a larger technological gap. This finding is in line with Kokko (1994) who was the first to study the influence of technology gap between local firms and MNCs. Thus
the coefficient in Table 1 above supports the proposition that countries lagging far behind the technology frontier of MNCs benefit relatively more from FDI in terms of spillovers. This supports Findlay (1978) who postulates that assuming a minimum level of financial development, countries with a large initial technology gap experience a higher labour productivity through FDI.

Theory further hypothesises that the degree of openness of the economy will have positive effects on productivity. Referring to the openness variable, a significant and positive relationship of the coefficient with TFP growth was observed. It therefore implies that the more the countries have liberal policies to trade, by being more open it will result in an increase in total factor productivity. This result supports Lai et al. (2006), who argues that more open economies will have a higher chance of accessing and benefiting from the expertise developed in the rest of the world. It can also be argued that the penetration of foreign products in local markets encourages competition in the host country. As such, inefficient domestic firms may be forced to become efficient, or scale down their operations or simply exit the market. Foreign competition further encourages the use of better quality and more technologically advanced inputs in producing goods for exports, thereby resulting in increased productivity. According to Nordas et al. (2006), if FDI is accompanied by international trade, then knowledge transfer and the learning-by-exporting process is strengthened.

It is also observed that inflation has a negative impact on total factor productivity growth. This result is in accordance with Baltabaev (2014). Many of the countries analysed in the study experience high rates of inflation and the results thus support economic theory in various ways. For instance, inflation may adversely affect productivity by causing an inefficient mix of input resources. Inflation causes misperceptions of the relative price levels and leads to inefficient investment plans and therefore affects productivity inversely (Clark 1982). The price mechanism plays an important role in allocating resources efficiently in a market economy. Inflation disrupts the proper functioning of this mechanism, resulting in distortions and misallocation of resources.

Higher levels of human capital can help countries to develop their technologies as well as increase the ability of those countries to absorb technologies developed elsewhere (Kneller 2005, Nelson & Phelps 1966). Greater human capital obtained from education, training and accumulated through learning-by-doing processes can increase the efficiency of labour and also enhance TFP. In the present study, negative but yet insignificant results for human capital were obtained.

The VAR framework enables the authors to gauge more interesting insights on endogeneity issues and also indirect effects. Referring to the ‘FDI’ equation, it is observed that a reverse causation exists and that TFP growth appears to be a determinant of FDI. It was found that a 1 per cent increase in productivity results in 0.24 per cent increase in FDI inflow. It therefore implies that the productivity level of the countries plays an important role in attracting FDI, thus supporting a bi-causal and reinforcing relationship between TFP growth and FDI. As observed, the most interesting economic scenario suggests a two-way causal link between FDI and Host Country’s Economic Growth. Countries with fast growth generate more demand for FDI and offer opportunities for making profits. On the other hand, inward FDI flows may enhance growth through positive direct and indirect effects on variables that affect growth. FDI as a dependent variable is highly influenced by all the other control variables. Consequently, it is observed in terms of magnitude that past values of FDI, human capital, openness and technology gap are all important determinants of FDI. Such results provide insights as to the policies that a country should develop in order to attract FDI in the long term. For instance, the coefficient of human capital suggests that for each percentage increase in HC, FDI increases by 0.51 per cent. This serves as an incentive for governments to increase their investment in human capital in order to enhance labour productivity. The impulse response analysis also tends to confirm the above results in general.2

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2 Impulse response analysis has been used to investigate the effect of a one per cent point shock in productivity growth rate to foreign direct investment.
6. CONCLUSION

This paper focused on a panel set of Sub Saharan African countries to simultaneously explore the interaction among foreign direct investment and TFP growth in a unified framework. Most studies on FDI spillovers use firm-level data, but this study uses macro-level data in trying to establish the spillover effects outside the industry. Rigorous panel VAR procedures were employed mainly to examine this complex linkage between FDI and TFP over the years 1980 to 2010. The panel VAR enables the identification of some determinants of TFP growth. A survey of the literature on spillovers identifies several reasons explaining why and how host countries benefit from inward FDI. However, empirical evidence from such studies provides mixed results and is inconclusive.

By measuring FDI as the stock of FDI in real GDP and the dependent variable as TFP growth, it can be seen that there is support of FDI as an important factor in the TFP growth model as evidenced by the positive and significant effect on TFP growth. This result is further confirmed by the impulse response function analysis. The other control variables used in the study, such as openness and technological gap, also positively contribute to TFP growth in the sample of economies under study. As expected, inflation is seen to negatively influence TFP growth.

Results from the analysis indicated the presence of a bi-directional causality between TFP growth and foreign direct investment. Indeed, although FDI induced a positive impact on TFP growth, openness was also seen to be an important determinant of TFP growth. The PVAR approach has also enabled the authors to conclude that human capital, openness, TFP growth as well as high technological gap taken together are important determinants of FDI for the sample of countries used.

7. POLICY RECOMMENDATIONS

Since FDI is viewed as an important determinant of TFP growth, appropriate policies to attract FDI should be adopted by governments. In the short term a policy of aggressively attracting foreign direct investors in industries heavily populated by domestic firms may have a significant negative impact on domestic entrepreneurship. Within a longer term structural perspective, FDI and domestic entrepreneurship may become complementary because of many possible positive linkages. Some active measures to achieve long term benefits from FDI, particularly those that will help the development of backward and forward linkages as viewed by policy makers, are mainly improving the functioning of the banking system and capital markets, educational reforms to increase the supply of appropriate skills and the provision of new infrastructure. For the development of new industries such policies may prove fruitful.

Moreover, an improvement in institutional capacity and easier administrative procedures would strongly favour the entrance of foreign firms in the host countries. Thus, policies to promote FDI should ensure capacity development, innovation and better knowledge transfer. Strategies like educational and training policies to improve skills and competency; public investment policies to enhance the local infrastructure in terms of communication and transport networks; incentives to encourage local firms to invest in technological development so as to improve their absorptive capacity; and trade policies conducive to international trade would all assist in attracting FDI.
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CHINA AND SOUTH-SOUTH “SELF-SUSTAINING GROWTH”: An Opening for Industrial Policy and Catch-Up Development

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Abstract

A revival in South-South economic relations has raised the possibility of a shift in global power with profound implications for economic progress and poverty reduction in the developing world. Despite burgeoning South-South economic ties, this discussion paper investigates behind the headline numbers to examine the underlying factors driving South-South relations and areas of strategic developmental cooperation. For now, South-South economic flows are being driven by China and its ability to deploy an unorthodox growth model that tilts the economy in favour investment, which is crucial to its ambitious climb up the industrial value chain. Arthur Lewis’s five-sector framework (food, fertilizer, cement, steel and machinery) is used to assess China’s economic trajectory, which clearly remains a work in progress, but shows signs of indigenous technological capabilities taking root, particularly in medium technology capital goods industries.

The gap between China’s industrial ambitions and its current capabilities provides a strategic opening for other developing countries to bargain for enhanced opportunities for domestic investment, learning, technical change and structural transformation. At the same time, China’s “real-time” formulation and practice of industrial policy processes are a source of inspiration for other developing countries searching for an alternative growth path. In a post-crisis setting, such demonstrations act as a useful template for re-thinking development priorities and to gradually begin re-casting economic policies within a national framework more conducive to catch-up and self-sustaining growth.

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1. INTRODUCTION

The recent revival of “South-South” (between developing countries) economic relations and cooperation has been presented as part of a seismic shift in international relations as global economic power shifts away from advanced industrialized countries (the “North”) towards the countries of the developing world (the “South”). The implications of this global power shift for economic development and poverty reduction in the world’s poorest and most vulnerable countries and regions could be profound.

Indeed, rapid economic growth performances in some large developing countries have given new impetus to South-South economic relations as witnessed in trade, investment, development assistance, and other financial flows. For instance, in trade, the South’s share in total world exports rose from 19.7 per cent in 1990 to 42.0 per cent in 2010; for imports, the South’s share grew from 18.9 per cent in 1990 to 38.9 per cent in 2010 (Nayyar 2013:6). In terms of merchandise trade, the share of South-South exports in total Southern exports increased from 45.0 per cent in 1996 to 53.2 per cent in 2010; similarly for imports, the share of South-South in total Southern imports grew from 32.8 per cent to 51.4 per cent over the same period (Athukorala & Nasir 2012:181).

To understand the drivers of burgeoning South-South economic interactions it is imperative to go beyond the aggregate headline numbers in order to grasp the underlying dynamics at play and to better identify the strategic developmental opportunities in South-South relations and cooperation (SSC).

First, optimism surrounding “South-South” ties is not new. Writing at a time of heightened interest in South–South cooperation, Arthur Lewis in his 1979 Nobel lecture presaged much of the recent discussion around global economic decoupling and catch-up growth. Lewis argued that the South could continue to grow at 6 per cent per annum if the North slowed down sharply. The critical link for Lewis was trade: sustained rapid growth would require strong export growth, but if demand was shrinking in Northern markets, where would the demand come from? Lewis suggested that South–South trade could fill the gap, in the aggregate, but also for potential sectoral bottlenecks in agriculture and capital goods. In particular, Lewis argued that expanded production in developing countries in five key sectors - food, fertilizer, cement, steel and machinery - could lessen dependence on advanced industrialized countries for key industrial inputs and buttress “self-sustaining growth” in a critical number of developing countries (Lewis 1979).

Second, neither the “South” nor the “BRICS” (Brazil, Russia, India, China and South Africa) are homogenous entities. Differences in country growth strategies and domestic economic conditions among leading countries of the South determine to a large degree their pattern and extent of economic relations with other developing countries, as well as in advanced industrialized countries as well. To be sure, the implication of individual BRICS growth models goes well beyond the neat labelling of China, Brazil and India as the respective factory, farm, and back office of the world economy (Milberg et al. 2013). For now at least, convergence among leading emerging markets is led by China, which accounts for 67 per cent of total BRICS trade with the world, and whose economy accounts for roughly 55 per cent of total BRICS gross domestic product (GDP) (Freemantle & Stevens 2013). Even among the BRICS, China acts as the bilateral trading partner in 85 per cent of intra-BRICS trade flows (Freemantle & Stevens 2013). At the regional level, for example, China is by far the leader among BRICS countries in exports of goods to Africa, accounting for a growing share of total BRICS exports to Africa, from 37.4 per cent in 2001 to 56.6 per cent in 2012. China’s exports to Africa surpassed the combined exports to Africa from the other BRICS countries as of 2007 (see Figure 1 below).
This situation, it will be argued, is closely linked to China’s ability to wield unorthodox policy tools, such as, for example, capital controls, stable and competitive exchange rates, low interest rates, state banks and enterprises - that have been decisive in tilting the economy towards sustaining high rates of domestic investment over the course of three decades and export growth since the 1990s. This policy framework has allowed China to mobilize, channel and accumulate capital resources over time to the point where it can now deploy this capital not only in accessing natural resources and foreign technologies and brands, but also as a competitive advantage in diversifying its trade and investment patterns, creating beachheads to previously lightly- or under-served markets as part of its overall “going out” strategy that began in the early 2000s (Freemantle & Stevens 2012; Wolf Jr. et al. 2011; Salidjanova 2011).

A key question in assessing China’s overall economic trajectory, with likely ramifications for SSC, is the extent to which it is deepening its industrial capabilities and diversifying into productive sectors and activities up the industrial value chain, and at what pace. At this point in time a definitive answer is not possible, but China finds itself at a crucial crossroads where it is at once the preferred low-cost assembly platform of many global value chains (GVCs) or the low value-added “workshop” of the world, as well as a stronghold for heterodox economic policy-making, mixing degrees of openness with protection, including through the use of industrial policy and state ownership that on some accounts threatens to “buy the world”.

With industrial policy in the leading economies of the South likely to gain more prominence in a post-crisis setting (Salazar et al. 2014, Gereffi 2013), whether China is able to work through this stage of its development process will likely resonate with other developing countries actively seeking their own viable path to growth and (shared) prosperity.


In many ways, the variety of analytical and empirical interpretations of China’s development experience (and its consequences for other developing countries) represents a replay of the heated debate in the 1990s over the lessons from earlier successful East Asian economies, such as Japan, South Korea, and Taiwan (China). During that time, the World Bank (1993) published its landmark report of these experiences, the *East Asian Miracle: Economic Growth and Public Policy*, which controversially recognized the significant role of government in guiding growth and fostering strategic sectors, but ultimately denied the effectiveness of such measures - much to the chagrin of many heterodox economists and policy-makers (Poon 2009:6-7).

Analysis of China’s experience was largely left out of the World Bank report, leaving the field open to the growing number of studies on “policy lessons from China” that have been published in recent years (OECD-IPRCC 2011a, 2011b). As in the 1990s with East Asia, there appears a tendency to assess China’s experience mainly in terms acceptable to conventional neoclassical economic prescriptions and Western donor government preferences, rather than using China’s experience as an objective “complement to imperfectly developed theory” (El-Erian & Spence 2008:27) to improve decision-makers’ sensitivity to relevant variables that drive growth and other specific policy outcomes. And it remains just as pertinent that this time around, “real headway in understanding China’s variety of capitalism will come by analyzing the system on its own terms, rather than principally by reference to something it is not” (Lin & Milhaupt 2013:4).

Unlike the 1990s, however, heterodox economists have generally been hesitant to suggest China’s experience as a viable and relevant alternative model for other developing countries, as was readily done in reference to the earlier cohort of East Asian economies. There are a number of reasons for this, such as those relating to country size and history, but also perhaps due to an “implicit but substantial authoritarian penalty” that colours views of its political regime. Still, it is worth noting that current evaluations of China are taking place at an earlier stage of its development than was the case in the World Bank report, which evaluated those East Asian economies at a later, more advanced stage of their catch-up development processes (particularly Japan). In China’s case, successful convergence with living standards in advanced economies still remains some way off, which makes crisp conclusions about the impacts of its policy choices more difficult and risky to make at this point in time.

Nonetheless, this discussion paper argues that increasing signs of independent technology capabilities, particularly in medium technology machinery equipment sectors, is indicative of the Chinese government and firms gaining momentum toward a “big push” in competitive homegrown heavy industry capital goods sectors broadly analogous to South Korea’s and Taiwan’s (China) stage of economic development in the 1970s, and Japan’s in the 1950s/1960s. This stage of China’s development is particularly critical, given cross-country evidence revealing strong positive relationships between machinery and equipment investment intensity with economic growth and productivity gains (DeLong & Summers 1992), which also turns out to be a key feature distinguishing East Asia from other post-war development experiences.

The structure of the discussion paper is as follows. The next section sets the context for discussion by juxtaposing the evolution of broad export and import trends of China’s conventional and processing trade regimes, highlighting the main trend where processing trade imports have not kept up with the processing of trade exports since the mid-2000s. Setting the stage for the later application of the Lewis five sector framework, developments in the Chinese motor vehicle industry are used to illustrate some of the sectoral dynamics underpinning the changing trends in trade flows.

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Section III interprets these trends through China’s so-called “dual track” economic reform strategy that blended ongoing support for import-substitution in selected sectors with an evolving array of export processing activities. China’s export processing prowess is widely documented, but the strategic policy regime of import-substitution in selected strategic sectors is often less appreciated despite its close connection to the heart of China’s bank-centric investment-led growth model. This model is now said to have outlived its usefulness, but the shift from investment- to consumption-led growth is not likely to be a straightforward linear process, for reasons relating to the development policy objectives that led Chinese leaders to adopt an investment-led model in the first place.

Section IV shifts gears by applying Lewis’ five key sectors as a framework to assess China’s development trajectory and the extent of South-South trading linkages in this regard. The section then focuses on the machinery sector, identified by Lewis as “more bothersome” in which to gain international competitiveness, to underscore the growing role of Chinese firms and their enhanced production capacities in this area. Overall, China does not appear in a position to anchor Lewis’s vision of self-sustaining growth writ large across the South, but there are indeed persuasive signs that indigenous technological capabilities are taking root in medium technology capital goods and intermediate input industries on a scale and scope that carries significant structural implications not only for China, but also for other countries of the South.

With the China story literally unfolding and the outcome still uncertain, sections V and VI address the reality that if Chinese firms are gradually moving up the value chain, ultimately the high degree of global corporate concentration across a wide range of economic sectors presents an enormous competitive challenge to China’s industrial ambitions (and any resulting impacts on SSC). Here, the discussion revolves around the extent that China can be said to have sufficient policy space to use as leverage against globally dominant foreign companies, with a special focus on the current state-of-play in anti-monopoly legislation and regulatory implementation to provide a litmus test of China’s overall industrial policy orientation and potential room for manoeuvre.

The last section’s concluding remarks emphasise that China’s industrial ambitions remain a work in progress, and although Beijing’s competitive challenge is surely more North-South in nature, calculations of bargaining power are equally important to developing countries, albeit adjusted to their distinct development circumstances. However, a static assessment of China’s dynamic economic trajectory will not suffice, whether excessively positive or negative. In either case, policy-makers would take for granted or dismiss the finer details that would allow for better identification and management of specific bilateral opportunities (or threats), which could over time be leveraged (or mitigated) in accordance with domestic development priorities.

At the same time, China’s “real-time” formulation, sequencing and implementation of industrial policy processes provides other policy-makers with a powerful learning example of a viable and durable alternative growth path. In a post-crisis setting, such demonstrations act as a useful template for re-thinking development priorities and to gradually begin re-casting economic policies within a national framework more conducive to catch-up and self-sustaining growth.
2. A TALE OF TWO CHINAS

China’s spectacular export performance is a prominent feature of the country’s economic post-1980s reform process that saw China’s share of global merchandise exports increase from 1.8 per cent in 1990, to 3.9 per cent in 2000, to 11.2 per cent in 2012. Some observers forecasted that by 2030, China will account for 15 per cent of global merchandise exports, roughly double the share forecasted for the US (Subramanian & Kessler 2013). By the early 1990s, structural changes in China’s export basket from lower value-added manufactures such as apparel and clothing accessories, towards higher value-added manufactures such as electrical, computers, and telecommunications equipment, has led some to argue that China’s export bundle resembled the sophistication of a country with an income-per-capita level three times higher (Rodrik 2006).

Critics point out, however, that China’s apparent export sophistication is misleading given elevated degrees of imported high-value parts and components that are assembled in factories based in China and subsequently re-exported. This is known as China’s “triangular” trade or “processing” trade whereby China acts merely as the preferred low-cost assembly platform, the last stage in GVCs whose design and architecture are ultimately orchestrated by multinational corporations (MNCs) based in advanced economies (Hanson 2004, Gilboy 2004, Amiti & Freund 2007, Moran 2011). As a share of China’s total exports, processing trade rose rapidly as of the mid-1990s from about 46 per cent to 55 per cent in 2003, a level roughly maintained with the onset of the financial crisis in 2008. An examination of the production chain for an Apple iPod, for example, revealed that only US$4 out of the total value of US$150 can be attributed to producers located in China while most of the value accrues to lead firms based in the United States, Japan and South Korea (Dedrick et al. 2009).

For these reasons, these observers generally contend that China has integrated with the global economy on terms that only reinforce its dependence on foreign technology and investment, thus restricting the country’s potential to become an industrial and technological challenger to advanced economies. By extension, China’s inability to move up the industrial value chain implies that its economic production structure could remain competitive only in low-value labour-intensive goods, which could be detrimental to industrial growth of other developing countries since light manufacturing sectors often act as a first step to wider processes of industrialization (Renard 2011, Kaplinsky 2008).

Figure 2 below tracks China’s export and import trends for conventional and processing trade over the period 1990-2011. “Conventional trade” is understood as goods not reliant on the use of duty-free imported parts and components that are re-exported (in the case of exports), and as goods that reach the domestic market either for investment or final consumption (in the case of imports). In contrast, “processing trade” involves imports of goods to be assembled or transformed in China and re-exported. In this type of trade, customs tariffs on imported inputs (raw materials, semi-finished goods, parts and components) are waived and neither these imported inputs nor the output normally enter China’s domestic market (Gaulier et al. 2005:15-6).

As shown in Figure 2 below, processing exports overtook (by nominal value) conventional exports for the first time in 1993 and remained higher until 2011. Processing trade imports surpassed conventional trade imports for the first time in 1994, but this lasts only until 2000 when conventional imports overtook processing imports thereon after. By the mid-2000s, conventional imports experience a pronounced surge relative to processing imports, largely due to the rapid rise of primary commodity prices which tripled (at constant 2005 prices) during the period 2003 to 2008 (Akyuz 2013:28). Raw materials and fuels, by comparison, generally only account for a very small proportion of processing trade exports and imports (Gaulier et al. 2005:21), which make processing trade trends less susceptible to changes in primary commodity prices.
Most striking in Figure 2 are the two trend changes observed in conventional and processing exports and imports. First, in processing trade, thin surpluses are maintained up until 2002, after which the surpluses begin to grow with a widening divergence between processing trade exports and imports, suggesting greater use of domestically-sourced inputs. Second, conventional exports generally stay above conventional imports for most of the period, but by 2009 conventional imports surpassed exports and the deficit in conventional trade appears to gradually widen up to the current period, helped by economic stimulus and the recovery in primary commodity prices from the beginning of 2009 (Akyuz 2013:28). Though conventional trade is in deficit by 2011, conventional exports exceed processing exports for the first time since 1994, which is significant given that domestic value added is estimated to be much higher for conventional exports (on average 65 per cent) than for processing exports (on average 36 per cent) (Hanson 2012:46).

What explains this apparent divergence in export and import processing trade and the more nascent rise of conventional over processing exports? If China’s processing trade is assumed to remain dependent on imports of key parts and components, processing trade imports should be expected to roughly track trends in processing trade exports. But this is clearly not the case, as processing exports have continued to grow at a faster rate compared to processing imports. Domestic production capacity in a number of key intermediate products from chemical fibres to steel, to plastics, to industrial boilers and semiconductors, has grown by several multiples since 2000. Within the ambit of processing operations, FDI has played an important role in these trends, as China’s processing trade moved away from simple assembly operations to other stages of production with greater scope for using domestic inputs. By 2006 assembly operations accounted for about 10 per cent of processing trade balance, compared to more than 30 per cent in the late 1990s (Cui & Syed 2007:6-7).

The declining import content of exports can also be seen in examining more specific trends of China’s exports and imports of computers, computer parts, and computer peripheral devices: in 1994 exports were 1.6 times imports in the sector; by 2008 they were 4.2 times imports. As Hanson (2012) explains, “While it is unclear how much one can generalize from China’s experience, growth in trade involving middle-income manufacturers...
does not necessarily go hand-in-hand with greater back and forth flows of intermediate inputs” (Hanson 2012:47). While some of this increased domestic sourcing was a result of foreign companies bringing more production stages to China in a process of offshoring, there are other dynamics at play related to the style of Chinese reforms and different treatment of FDI depending on the type of sector and investor motivations. This is often referred to as China’s “dual-track” reform strategy and is further explained in the next section.

For now, a brief example using the motor vehicle industry, a quintessential “pillar” sector, will help illustrate some of the emerging sectoral drivers underpinning trends observed in Figure 2. A typical automobile consists of more than 15,000 parts and represents one of the most difficult manufacturing products to gain competency. The motor vehicle sector was not included in Lewis’ five sector framework, and in this regard acts as a higher benchmark with which to assess China’s development trajectory. Thus, while Chinese domestic auto-makers have yet to attain international competitiveness, the sector broadly reflects the enhanced production and indigenous technological capabilities taking root across a range of medium-technology capital goods, including key intermediate inputs for export and/or domestic markets (Naughton 2007, Brandt and Thun 2010, Bouffault et al. 2011, EIU 2011).

The output from FDI in the manufacture of complete motor vehicles was entirely destined for the domestic Chinese market, particularly prior to WTO accession in the late 1980s and 1990s, which was protected using high tariff duties (80-100 per cent) and import quotas on vehicles and parts. The government also enforced a number of stipulations such as a 50-50 joint venture (JV) ownership structure with a local partner and other requirements such as technology transfer and local content targets. On this latter score, for example, the local content for the Santana model from the SAIC-Volkswagen JV was only 2.7 per cent (by unit) in 1987, namely: the tyres, radio and antennae, but this grew rapidly to 80 per cent in 1993, and to 92.9 percent in 1997, as Shanghai municipality strove to build a strong auto supply base (Thun 2006:105, Harwit 2001:663).

By the late 1990s and early 2000s, however, the government had expanded the number of auto joint ventures and more aggressively negotiated for foreign partners to bring their latest technologies to further upgrade Chinese production capabilities. To this end, by 2004, the government removed similar JV requirements for foreign parts companies, effectively encouraging more suppliers to follow their original equipment manufacturers (OEMs) to China. Also in 2004, the government waived the JV requirement for motor vehicle manufacturers based in export processing zones, with other rules such as minimum project values, capital investment levels, and technical requirements for automobile and engine producers also waived. For instance, Honda was permitted a 65 per cent ownership stake in its auto assembly plant in Guangzhou, as the factory’s output was solely for export (Stewart et al. 2012: 55-6, Haley 2012:8, Tang 2012).

Boosted by these policy changes, by the mid-2000s, China started raising exports of complete motor vehicles and in motor vehicle parts. Automotive parts exports have grown rapidly from $10bn in 2004 to $48bn in 2010, with many of the “Tier 1” auto suppliers (supplying entire assemblies like braking systems and steering systems) such as Delphi, Visteon, Johnson Controls, Lear, Arvin Meritor, TRW, Bosch, Denso and Magna, among others, all with manufacturing bases in China (Canis & Morrison 2013:7-8). The American market accounts for nearly one quarter of China’s auto parts exports (by value), and while it was long believed that Chinese auto parts exports served the United States aftermarket, there is also evidence that US-based automakers are relying on parts provided by their traditional auto parts companies, but supplied from their operations in China instead of the United States. One study found that in 2010 and 2011, Chrysler, Ford and GM imported not only relatively simple parts from China, such as knobs, lights, rear view mirrors, and exhaust manifolds, but also more sophisticated products such as transmission electro-hydraulic control modules and control resistors (Stewart et al. 2012:72-81).

Nonetheless, some of these auto parts exports are likely also linked to exports of domestic Chinese branded vehicles: in 2011, China exported nearly 850,000 units of which 70 per cent were manufactured by homegrown upstart firms such as Geely and Chery, with the remainder by foreign and Chinese JVs.\(^4\) The main destinations

\(^4\) Of course, roughly the reverse is true in the domestic market, where the market share (by sales) of Chinese-branded automobiles peaked at 31 per cent in 2010, and has since declined to 27 per cent by February 2014. [Mitchell, Tom (2014). “Chinese carmakers yet to make their marque”, Financial Times, February 4.]
of these exports are developing markets in South America, Africa, and the Middle East, though overall auto exports still only account for a very small proportion of total auto output (Canis & Morrison 2013:3-4). Previewing section IV’s application of Lewis’s five sector framework to assess China’s development trajectory, Figure 3 below provides a glimpse of Chinese export shares to OECD markets of different motor vehicles and motor vehicle parts and accessories for 2001-2012. Keeping in mind the current stage of China’s development, if the share of exports to OECD markets is relatively high, then the share of that same item to the South is low, implying that China’s involvement is likely part of an offshoring process, the governance of which constrains the extent that trade patterns can diversify to the South – a rough proxy for the outgrowth of improved Chinese indigenous technological capabilities (and vice versa if the export share to OECD markets is low and to the South is high).

FIGURE 3: SHARE OF CHINESE EXPORTS TO OECD COUNTRIES, VARIOUS MOTOR VEHICLES, PARTS AND ACCESSORIES, 2001-2012

Source: ITC.

In light of the discussion above, it is not surprising that exports in motor vehicle parts and accessories show the highest reliance on OECD markets, though this appears to be declining, from 83.7 per cent in 2001 to 68.7 per cent in 2012 of total Chinese exports in this category. By comparison, the share of exports of cars to OECD markets grew rapidly in the mid-2000s to 65.4 per cent in 2005, before falling back to 27.3 per cent in 2012 – though the export value was only $4.6bn in 2012, compared to $25.5bn in exports of parts and accessories. In other motor vehicles such as trucks, commercial vehicles and public transport passenger vehicles, Chinese export shares to OECD markets are very low, actually rising in 2012 to 5.5 per cent in the case of trucks and commercial vehicles, and to 11.3 per cent for public transport passenger vehicles. As in cars, the export volume is also relatively low: in 2012, $4.0bn for trucks and commercial vehicles, and $2.1bn for public transport passenger vehicles.

Note that these figures are different and much lower than those reported in Stewart et al. (2012:75) largely because the ITC statistics in Figure 3 do not include auto parts and accessories outside of the HS-8708 category, whereas the trade statistics from Stewart et al. (2012) also include parts from other categories used for automobile motor vehicle production, such as laminated safety glass (HS-7007), furniture parts (HS-9403), hinges of base metal (HS-8307), among a wide range of other HS-categories (Stewart et al. 2012: see exhibit 1).
From these broad trends, it appears that indigenous Chinese technological capabilities in the manufacture of complete automobiles and auto parts are gradually being established but face significant challenges, although this is less the case in manufacturing of other motor vehicles like commercial vehicles and passenger transport vehicles where foreign brands are largely confined to premium niches in the domestic market (Lang et al. 2012:18-20, Chu 2011:1244).

The picture presented above is a messy one that does not lend itself to predictable ready-made conclusions, but this is perhaps to be expected for a country in the process of upgrading its productive and indigenous technological capabilities rather than one that is on the cusp of the technology frontier. Nonetheless, this more detailed analysis of sectoral level dynamics begins to explain some of the underlying factors shaping the more recent trends in conventional exports and the divergence between processing imports and exports. These trends are emerging signs of a different kind of manufacturing competition across a range of capital goods sectors in China and are further pursued in section IV, with a focus on machinery. The next section first delves into the broad contours of China’s “dual-track” reform strategy and its close connection to China’s investment-led growth strategy, to better understand the catch-up policy framework China used to get where it is today.

3. INVESTMENT-LED GROWTH THROUGH DUAL-TRACK REFORMS

Broadly speaking, the difficulty in assessing China’s development trajectory stems from the “dual-track” nature of its economic reforms (McMillan & Rodrik 2011, Lin & Wang 2008, Qian 2003, Potter 2003, Green 2003). In economic development and trade policy, in particular, the reform package combined ongoing support for import-substitution in selected sectors, while simultaneously conducting export processing activities considered as “new” for the domestic economy. The strategy itself is hardly novel, and is most closely associated with the past successes of Japan and first-tier Asian newly industrialized economies (NICs), South Korea and Taiwan (China), that also placed significant emphasis on building strong productive capacities in medium-technology capital goods sectors, referred to as the “secondary import substitution” phase that was key to the upgrading process in the domestic economy and for raising the contribution of domestic value-added in exports (Studwell 2013:84-136, Weiss 2005a:17-24).

Though it is commonly held that it is now in China’s interest to shift from an investment-led growth strategy to one that is more driven by domestic consumption, such statements are often made with little consideration to the sequencing or pacing of this transition, which relate to the underlying policy objectives that led Chinese leaders to adopt an investment-led model in the first place. Given the close relationship between the ability to invest, economic diversification, and technology upgrading, this section ultimately argues that Chinese policy-makers are likely to be very attentive to the link between the pace of economic rebalancing on the one hand, and solid assessments that domestic firms are indeed progressing up the industrial value chain on the other.

The defining feature of this dual-track approach was to effectively cordon-off strategic parts of the domestic economy from the processing trade regime’s outputs and imported inputs. This is the essential difference in policy regime toward incoming FDI to China that is “market-seeking” (to gain access to the domestic market), and FDI that is “efficiency-seeking” (to utilize China as a low-cost assembly platform) (Dullien 2005:130-1; Lardy 2004:128). In the former, which in Chinese parlance are portrayed as sectors forming the “lifeline” of the domestic economy, the policy regime adopted more familiar industrial policy instruments such as foreign ownership limits (for example, joint ventures), technology transfer and local content requirements, research and development (R&D) expenditure targets, government procurement and other financial incentives, industry restructuring and merger incentives, and demand-side consumer subsidies, among other supportive policies.

The policy regime for efficiency-seeking FDI was not without its own set of incentives generally related to special economic zones, such as selective value-added tax rebates, corporate tax holidays, infrastructure provision (not
to mention stable and competitive exchange rates), but was relatively more permissive in terms of limitations on economic activities.

The concepts of “strategic”, “key”, “backbone” and “pillar” sectors have a long history in China, but it was only in 2006, and after the establishment of the State-owned Assets Supervision and Administration Commission (SASAC) in 2003, that the Chinese government more clearly delineated these categories of industries in relation to the role of the state. SASAC was mandated to own and manage state assets at the central level, while giving guidelines for SASAC bureaus in local governments. Initially, SASAC was bestowed 196 of the country’s largest enterprises, with the plan to reduce the number of firms to 80-100 by 2010. As of year-end 2013, 113 enterprises remain under SASAC’s ownership. Including firms overseen by provincial- and municipal-level SASACs, the total number of state owned enterprises (SOEs) are estimated to exceed 100,000 (Ssamosszegi and Kyle 2011).

Most of the firms overseen by SASAC are found in natural monopoly sectors, but it also maintains assets in competitive downstream manufacturing and service sectors as well. For instance, defence, electrical power and grid, petroleum and petrochemical, telecommunications, coal, civil aviation, and shipping are categorized as “strategic” sectors where the state will maintain sole ownership or absolute control. Other sectors, such as equipment manufacturing (machinery), automobiles, information technology, construction, iron and steel, non-ferrous metals, chemicals, land surveying, and R&D and design, are categorized as “pillar” industries where the state will maintain strong control and influence (Ssamosszegi and Kyle 2011; Mattlin 2009, 2007; SASAC 2006). For these reasons, it is commonly observed that Chinese state firms still retain control over the “commanding heights” of the economy (Chatham House 2012:4; Lo and Wu 2012).

To be sure, an important contributing factor to the confusion surrounding China’s development trajectory, particularly in pillar sectors where FDI has been market-seeking, is often due to the difficulty in accurately assessing the role of the state in the economy following the complicated process of transactions involving SOE (partial) privatizations, restructuring, joint ventures, and mergers and acquisitions over the past three decades. As Szamosszegi and Kyle (2011) further explained,

State-owned enterprises are business entities established by central and local governments, and whose supervisory officials are from the government. In official statistics, this category of firms includes only wholly state-funded firms. This definition excludes share-holding cooperative enterprises, joint-operation enterprises, limited liability corporations, or shareholding corporations whose majority shares are owned by the government, public organizations, or the SOEs themselves. A more encompassing category is, “state-owned and state-holding enterprises.” This category includes state-owned enterprises plus those firms whose majority shares belong to the government or other SOE. This latter category, also referred to as state-controlled enterprises (SCEs), can also include firms in which the state- or SOE-owned share is less than 50 percent, as long as the state or SOE has controlling influence over management and operation (Szamosszegi & Kyle 2011:7).

For the most part, it is the large state-owned firms that are the principal beneficiaries of China’s bank-centric financial system that drives the high investment, rapid expansion of infrastructure inside the Chinese economy. The core of the state sector, namely the oil, metallurgy, electricity, telecommunications and military industry sectors, accounted for three-quarters of the capital of SASAC-owned firms, which produced less than four per cent of China’s total exports (Naughton 2007). Overall, China’s level of investment has been strong since at least the beginning of reforms in the late 1970s, but particularly so in the last decade. During the 1980s, China’s investment rate averaged 36 per cent of GDP, which reflected the emphasis on labour-intensive light industry while capital-intensive state firms underwent adjustment following industrialization efforts in the pre-reform era (1950s–1970s). The investment rate increased further, exceeding 40 per cent of GDP in 1993 and again in 2005, before reaching just under 50 per cent of GDP in 2008 (Lo & Wu 2012, Hofman & Wu 2009, Lardy 2006, Kuijs 2005).

See SASAC’s website: http://www.sasac.gov.cn/n1180/n1226/n2425/index.html
With the continued state control and ownership of the Chinese banking system and the practice by China’s central bank, the People’s Bank of China (PBoC), to set bank lending and deposit rates while also limiting other investment channels for depositors, Chinese policy-makers have mobilized resources mainly by engaging in so-called “financial repression” in making low-cost pools of savings/capital available to the banking system. This was a conscious policy decision to rely on domestic bank credit, rather than turning to and tapping into international capital markets and the benefits and risks such an option entails. Although the role of bank credit has been reduced through reform measures that have led to developments of other capital sources (bond and stock markets) as shown in Table 1 below, China’s financial system remains predominantly bank-centric (WB & DRC 2012:116, Kruger 2013).

TABLE 1: BREAKDOWN OF FINANCIAL SECTORS AND MARKETS AS A SHARE OF GDP (%), 1999-2010

<table>
<thead>
<tr>
<th>Year</th>
<th>Assets of banking institutions</th>
<th>Assets of insurance companies</th>
<th>Assets of securities companies</th>
<th>Government bonds outstanding</th>
<th>Financial bonds outstanding</th>
<th>Corporate bonds outstanding</th>
<th>Stock market capitalization</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td>137.0</td>
<td>2.9</td>
<td>-</td>
<td>11.8</td>
<td>7.2</td>
<td>0.9</td>
<td>29.5</td>
</tr>
<tr>
<td>2000</td>
<td>138.5</td>
<td>3.4</td>
<td>-</td>
<td>13.1</td>
<td>7.4</td>
<td>0.9</td>
<td>48.5</td>
</tr>
<tr>
<td>2001</td>
<td>145.4</td>
<td>4.2</td>
<td>-</td>
<td>14.2</td>
<td>7.8</td>
<td>0.9</td>
<td>39.7</td>
</tr>
<tr>
<td>2002</td>
<td>169.8</td>
<td>5.3</td>
<td>-</td>
<td>14.8</td>
<td>8.2</td>
<td>0.5</td>
<td>31.9</td>
</tr>
<tr>
<td>2003</td>
<td>179.7</td>
<td>6.7</td>
<td>3.6</td>
<td>18.0</td>
<td>8.7</td>
<td>0.7</td>
<td>31.3</td>
</tr>
<tr>
<td>2004</td>
<td>175.0</td>
<td>7.5</td>
<td>2.1</td>
<td>22.4</td>
<td>9.1</td>
<td>0.8</td>
<td>23.2</td>
</tr>
<tr>
<td>2005</td>
<td>175.2</td>
<td>8.3</td>
<td>-</td>
<td>27.3</td>
<td>10.8</td>
<td>1.7</td>
<td>17.5</td>
</tr>
<tr>
<td>2006</td>
<td>204.0</td>
<td>9.1</td>
<td>-</td>
<td>28.9</td>
<td>12.1</td>
<td>2.6</td>
<td>41.3</td>
</tr>
<tr>
<td>2007</td>
<td>179.6</td>
<td>10.9</td>
<td>6.5</td>
<td>32.4</td>
<td>12.7</td>
<td>3.0</td>
<td>123.1</td>
</tr>
<tr>
<td>2008</td>
<td>204.3</td>
<td>10.6</td>
<td>3.8</td>
<td>31.3</td>
<td>13.4</td>
<td>4.1</td>
<td>38.6</td>
</tr>
<tr>
<td>2009</td>
<td>237.8</td>
<td>11.9</td>
<td>6.0</td>
<td>29.3</td>
<td>15.1</td>
<td>7.1</td>
<td>71.6</td>
</tr>
<tr>
<td>2010</td>
<td>241.6</td>
<td>12.7</td>
<td>4.9</td>
<td>28.1</td>
<td>15.0</td>
<td>8.6</td>
<td>66.7</td>
</tr>
</tbody>
</table>


This feature can also be highlighted through international comparisons in the structure of financial systems. According to one estimate, in 2012, bank credit to the private sector still totalled 128 per cent of GDP in China, compared to 48 per cent in the United States. The bond market in China, by comparison, provided credit equivalent of about 41 per cent of China’s GDP, while in the United States this figure was 243 per cent. Chinese stock markets had an aggregate market capitalization of about 44 per cent, which contrasts with advanced economies where capital provided by the stock market is typically lower than that of the bond market (Elliott & Yan 2013:8, JEC 2006:17).

In turn, the banking system channels household savings and other domestic resources disproportionately toward enterprises, especially state-owned enterprises, instead of households. For example, a breakdown of total loans from the banking system to the resident and corporate sectors for 2007-2010 reveals the share of loans to the corporate sector remained at roughly 80 per cent, which is supported by large-scale deposits in the banking system, equalling 186 per cent of GDP in 2010. This level of deposits-to-GDP is far higher than that of most other major reserve currency economies and also other major emerging countries (Prasad & Ye 2012:17-8). However, a major turning point came in 1998-1999, when the major banks were given a sizeable capital injection and their non-performing loans transferred (at book value) to four newly-created asset management companies (Okazaki 2007, Ma & Fung 2002).

7 China’s five large commercial banks - the Agricultural Bank of China (ABC), Bank of China (BOC), Bank of Communications, China Construction Bank (CCB), and Industrial and Commercial Bank of China (ICBC) - account for about half of the total assets in China’s banking sector in 2010. Through reforms, these banks have become joint stock companies, but for four of these five banks, the majority of shares are held by the People’s Bank of China (PBoC), the Ministry of Finance (MoF), or other government entities. Foreign banks, by comparison, accounted for just 1.8 per cent of total assets in the Chinese banking sector (Martin 2012).
Banking sector reforms took place alongside industrial sector reform in the 1990s, as government sought to raise the efficiency of SOEs by closing some and merging others, reducing government ownership by selling shares on domestic and international stock markets, and allowing SOEs to shed redundant labour. In 1997, for instance, there was an explicit drive to return a great majority of SOEs to a healthy profit within three years. From 1997 to 2006, profits as a share of GDP in state-owned and state-holding enterprises rose from 0.5 to 4 per cent. Improved management practices, a leaner state sector, WTO accession and a return to fast growth all contributed to bringing the state sector back to profitability. The establishment of SASAC in 2003 further enhanced management and oversight of state assets as the Chinese market structure stabilized, and state sector profits grew rapidly (Poon 2009, Yusuf et al. 2006, Nolan & Wang 1999).

Undoubtedly continued state ownership occurred in the context of increasing degrees of market competition. In all sectors in which state ownership is dominant, Chinese policy-makers have built in some competitive forces in what has been called “limited and managed” competition rather than full-on market competition. In sectors designated as “strategic”, the government typically structures these sectors with two or three large state enterprises often competing with each other as well as with a scrappy fringe of smaller firms generally supported by local governments. The practice is similar in “pillar” sectors, albeit often with a lesser degree of concentration. Thus, while incumbent firms are somewhat protected against competition by new entrants, whether private or domestic Chinese firms or foreign firms, Chinese policy-makers have consciously built some competitive forces in all sectors, even when the government is the only real customer, as a way of keeping managers of state firms on point (Naughton 2010 and 2007, Pearson 2005).

China’s 2009 stimulus plan for the auto sector, for example, organized the industry into a “top 10” group split into two distinct tiers: Tier 1 firms have an annual capacity of 2 million units and are encouraged to acquire smaller firms throughout China, while Tier 2 firms have an annual capacity of 1 million units and are encouraged to drive regional consolidation. The plan also identifies four domestic companies for each tier, with the two unnamed companies ensuring a degree of flexibility (Tse et al. 2009b:3-4). In the steel industry, by the end of 2009, eight of the ten largest steel groups were 100 per cent owned and controlled either by central or local government. Of the top ten steel groups, the top three produced between 30-40 million metric tonnes (MT), the next three produced 20-29 million MT, and the remaining three produced 10-19 million MT (Price 2010:6-8).

A key factor that makes China’s growth model different from other emerging countries is that increasing state sector profitability in turn led to higher levels of state enterprise retained earnings (such as enterprise savings), which was subsequently reinvested in the domestic economy. Enterprise retained earnings explain most of the cyclical fluctuation in domestic investment levels from the 1990s onwards, as these enterprise savings reached the level of household savings in 2000 and surpassed household savings levels in 2002 (Kuijs 2005). Critically, it appears China’s state sector was embedded with what Hirschman (1958) referred to as decision-making “inducement mechanisms” or “pacing devices” that compensate for organizational deficiencies by compelling investment decisions “because there is some extra pressure behind them as a result of pacing, routine responses, threatened penalties, certain and high profitability, or other forces” (Hirschman 1958:27, 39-41). As Naughton (2010) explains,

One of the most striking ways the Chinese government has encouraged investment is through the simple expedient of allowing Chinese SOEs to retain their after-tax profits. This policy, adopted quietly in 1994 in the context of overall fiscal reform, gives state firms strong incentives to increase profits, and few alternate uses of the profits created. Paying out too much of the profits in bonuses or managerial compensation can get a state-run firm in trouble; expanding the business through re-investment is the best, if not the only, alternative. ... Flush with retained funds, China’s state firms poured money into expansion and new investment projects (Naughton 2010:449).

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8 Ocampo (2005:4) refers to these features as “accelerator mechanisms”. 
In this way, China’s growth framework is highly reminiscent of animating a “profit-investment nexus” that was also the main distinguishing feature of the major growth phases of Japan and first-tier NICs (Akyuz & Gore 1996, Singh 1996). The nexus is particularly crucial in accelerating capital accumulation and growth, due to the dynamic feedback interactions between profits and investment that result because profits are simultaneously an incentive for investment, a source of investment and an outcome of investment. As in other East Asian cases, first, high rates of investment were crucial to rapid catch-up growth and this investment was sustained by domestic savings; second, savings and capital accumulation were increasingly derived from corporate profits; third, government interventions accelerated capital accumulation through policy-induced economic rents, which elevated rates of profit over and above those that could be achieved under free market conditions (Akyuz & Gore 1996:461-2).

The workings of this nexus are at the heart of current debates surrounding the rebalancing of China’s economy towards greater final domestic consumption and away from fixed asset investment (Akyuz 2011, Kroeber 2011). While there is much concern that China’s high investment rates have contributed to global imbalances, led to wasteful excess industrial capacity, environmental degradation and income inequality, an accumulation of non-performing loans and economic overheating, high investment rates are also associated with higher rates of learning, technical progress and structural change (Ocampo 2005:16). From this perspective, while China’s pace of growth is surely too slow, the pace of domestic economic rebalancing from investment-led to consumption-led growth is not likely to be a linear process, nor should it be.

Indeed, the two different growth models entail separate sets of policy instruments. For example, the debate surrounding drawing dividends from state firms in order to fund a more comprehensive social security system could indeed boost consumption by reducing one of the main drivers behind high levels of household savings. However, the proposal is controversial at this mid-stage of China’s development process precisely because it has clear financial and competitiveness implications for the firms involved and the overall economy (Mattlin 2011). Given China’s current stage of development, a decision to rigidly implement the dividend policy solely for rebalancing purposes would in turn limit the simpler policy options for boosting investment levels, if not potentially preclude the ability to reverse those decisions, should such an objective be considered desirable at a later date. A decision to, for example, promote modern corporate governance practices and market-determined dividends could be envisioned by abolishing government programmes, such as the Qualified Foreign Institutional Investor (QFII) programme, that limit the participation of foreign investors to influence Chinese stock market valuations.

Combined with a range of other wholesale reforms, such as fully commercializing domestic financial institutions (WB & DRC 2012:118), a preference may develop for lending to sectors with “easier” profits within a shorter timeframe, seeing less reason to provide riskier longer-term financing in reaching higher rungs on the value chain. Once entrenched, it is relatively easy to see how such kinds of reforms would be very difficult to reverse (as is the case in many other developing countries), especially if China’s macroeconomic fundamentals were to weaken, making the economy more reliant on foreign finance. Indeed, it is these kinds of features to China’s model that set it aside from the so-called “fragile five” emerging countries (Brazil, India, Indonesia, South Africa, Turkey) whose economies are structurally more reliant on foreign capital inflows.

Perhaps it is no coincidence that some analysts point to the link between a developing country having a “balanced” economy – with shares of investment and consumption roughly constant over time – and falling into the “middle-
income trap”, as is the case in some major Latin American countries. As argued by Huang (2013), only a handful of developing economies have escaped the middle-income trap in the post-war era – notably Japan, South Korea and Taiwan (China) – “[t]he common thread linking all these successful East Asian countries is that widening imbalances are associated with sustained high growth [and investment] rates that propelled these economies from medium- to high-income status, and eventually more balanced outcomes as their economies matured.”

In this way, Chinese policy-makers are well aware of the limitations and drawbacks in the current growth model but given their “invest first, consume later” approach, they are likely to be very attentive to the connection between the pace of rebalancing, on the one hand, and assessments that Chinese firms are effectively progressing up the industrial value chain on the other. On the latter score, while the evidence is not yet incontrovertible, there are increasing signs that such trends have built momentum and are making headway, notably in the medium-technology capital goods sectors.

4. LEWIS’S SELF-SUSTAINING GROWTH?
SINO-REDUX

The implications for South-South self-sustaining growth stem from understanding the key competitive features and dynamics of China’s investment-driven development stage, which lies between the more rudimentary stage driven by factor accumulation (land, labour, capital) and the more advanced stage driven by innovation. The investment-driven stage has been aptly described as a stage when competitive advantage is “based on the willingness and ability of a nation and its firms to invest aggressively” (Porter 1990), effectively using access to affordable capital as a source of competitive advantage in domestic, but also foreign markets.

China’s annual FDI outflows have grown rapidly over the course of a decade commensurate with the government’s “going out” strategy, rising from about $2bn in the late 1990s, to $5.5bn in 2004, to $21.2bn in 2006, to $56.5bn in 2009, and to $84.2bn in 2012. While these FDI outflows are still small in relative context, accounting for only 6 per cent of total global FDI outflows in 2012, China’s outflows are often in the form of financing packages related to tied-aid and overseas projects involving natural resource extraction and/or infrastructure-building with project loans often used to procure a majority of equipment, materials, technology and services from China. The level of tied-procurement can vary, but these features of China’s “going out” strategy have been a major catalyst in diversifying China’s trade and investment patterns and to bolstering SSC (Gallagher et al. 2012, Mlachila & Takebe 2011, Brautigam 2011).

The key SSC question remains: has China sufficiently expanded production capacities in the five key sectors identified by Lewis – food, fertilizer, cement, steel and machinery – that could potentially lessen dependence on advanced industrialized countries for industrial inputs and support “self-sustaining growth” in a broad number of developing countries? Figure 4 below provides an analysis of China’s export flows in four (minus food) of Lewis’ five key sectors for 2001-2012. It compares China’s respective exports to OECD countries in the four Lewis sectors: thus, for example, if the share of a given export good to OECD markets is high (or low), then the implication is that the share of that same good going to the South is low (or high), suggesting

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14 China is also a major producer and exporter of a wide range of agriculture commodities, for example, in fruit, vegetable, and livestock products, including apples, garlic, aquaculture products, poultry and pork. Meanwhile, agricultural imports have also grown dramatically since China joined the WTO in 2001, particularly for commodities like soybeans and cotton, making China one of the world’s top agricultural importers. Although China has generally remained self-sufficient in its own traditional measure of ‘grains’ (including cereals, soybeans and potatoes) this policy objective is becoming harder to attain as China’s consumption expands and domestic production faces resource constraints. In 2012, China’s traditional measure of self-sufficiency in grain fell just below 90 per cent (Gale 2013; Lohmar et al. 2009). For these reasons, ‘food’ is not included in the analysis of China’s production capacities in Lewis’ five key sectors.
China’s production capacity is part of an offshoring process that limits the ability to diversify trade flows to the South, and thus a rough proxy to assess current status of Chinese indigenous technological capabilities.

While China is a major global producer in all four of these broad categories (which are all considered “pillar” industries), the pattern of trade flows to the South reveals mixed results. Three of the four sectors show declining Chinese export reliance on OECD markets, with exports of fertilizers exhibiting the lowest share going to those markets, leaving cement as the only item among the four showing an increasing reliance on OECD markets. Given the sector’s close links with the processing trade, machinery exports are given closer scrutiny to highlight the growing role of Chinese firms and their enhanced production capacities. Importantly, parts of this sector have grown on the back of domestic (rather than foreign) demand and thus represent a more domestically integrated kind of manufacturing competition emerging from China.

Fertilizer exports, of which China exported $7.2bn in 2012 (ranked third in value), have shown a declining dependence on OECD markets, representing only 16.4 per cent of total Chinese fertilizer exports in 2012, and where the large majority of export destinations are other developing countries. Concrete, by contrast, where China exported $938.5m in 2012 (ranked first), revealed an increasing proportion going to OECD markets, accounting for 50.9 per cent of total Chinese concrete exports in 2012, where many of the export destinations are not other developing countries but developed or high-income countries. Similarly with exports of iron and steel and articles of iron and steel, where China exported $37.1bn (ranked second) and $56.2bn (ranked first) respectively, the proportion of Chinese exports going to OECD markets has declined over time but still remains relatively high. For China’s iron and steel exports, the share going to OECD markets declined from 53 per cent to 41.7 per cent from 2001 to 2012, whereas for China’s articles of iron and steel exports, reliance on OECD markets declined from 68.6 per cent to 50.6 per cent.

**FIGURE 4: SHARE OF CHINESE EXPORTS TO OECD COUNTRIES, LEWIS’ FOUR KEY SECTORS, 2001-2012**

![Graph](Image)

*Source: ITC*
Machinery is a special case, not only because Lewis considered this sector more difficult in which to gain competence due to “economies of scale, continually improving technology, and patented or secret knowledge”, but also due to its much larger scope compared to other sectors examined above. China exported $375.9bn in 2012 (ranked first), but like concrete and iron and steel, the share of these exports going to OECD markets has (to a lesser degree) declined but remains high, from 58.3 per cent in 2001 to 57.6 per cent in 2012. However, a different picture emerges once two sub-sectors closely linked to the processing trade are isolated, namely HS-8471 and HS-8473 automatic data processing machines and their parts and accessories. Crucially, Chinese exports of HS-8471 and HS-8473 show an increasing reliance on OECD markets from 59.1 per cent in 2001 to 63 per cent in 2012, whereas the rest of the machinery (HS-84) category reveals a declining trend, going from 56.7 per cent to 51.9 per cent.

Figure 5 provides a further glimpse of the changing structure of China’s machinery exports over the period 2001 to 2012. In 2012, HS-8471 and HS-8473 combined for a total of $193.9bn in Chinese exports, representing 51.6 per cent of all machinery (HS-84) exports. This figure remains substantial but is down significantly from 63.3 per cent in 2001. Over this period, the weight of all other HS-84 four-digit categories grew from 36.7 per cent to 48.4 per cent of total Chinese machinery exports, to a value of $182bn in 2012, nearly equalling the combined value of HS-8471 and HS-8473. Some of these other four-digit HS-84 categories are displayed in the stacked columns of Figure 5 below to highlight the emergence of a set of machinery exports that counter the narrative of China’s engagement with the global economy primarily through investment from MNCs. Domestic Chinese firms are taking an increasingly prominent role not only in driving the country’s “new wave” of exports, such as in construction machinery and equipment, but also in diversifying China’s export markets to other developing countries.

**FIGURE 5: CHANGING STRUCTURE OF CHINA’S MACHINERY EXPORTS (HS-84), 2001-2012**

Source: ITC; Hanson (2012:47); EIU (2011:5). See Annex for HS four-digit categories in stacked columns.
For example, China’s exports of HS-8429 self-propelled bulldozers and excavators reached $4.9bn in 2012, only 10.8 per cent of which went to OECD markets. This share is down from a level of 31.4 per cent in 2001. Similarly, China’s exports of HS-8426 derricks, cranes and trucks with cranes reached $3bn in 2012, 26.3 per cent of which went to OECD markets. This share is down from a level of 46.1 per cent in 2001. For China’s exports of HS-8428 lifting/handling/loading machinery reached $3.5bn in 2012, 28.8 per cent of which went to OECD markets. This share is down from a level of 50.3 per cent in 2001. To put this into a wider context, these three categories (HS-8429, HS-8426, HS-8428) alone total $11.4bn, representing only a small proportion of China’s total machinery (HS-84) exports. Nonetheless, this amount is at roughly the same level of other respective BRICS countries’ total machinery exports in 2012: Brazil with $13.9bn, India with $11.1bn and Russia with $7.6bn.

These structural changes reflect improvements in domestic firms’ productive capacities, particularly in precision levels of metal-cutting/shaping facilities, and in metallurgical processes, as well as enhanced thresholds for strength and durability. In construction machinery, for instance, China’s solid foothold in the production of cranes, cement trucks and pumps has evolved to include earth-moving equipment, a market normally dominated by firms from the United States, South Korea and Japan. These trends suggest a different kind of competition emanating from China: unlike the processing trade and even joint-venture-driven sectors such as the automobile industry, the construction equipment sector does not rely on FDI to nearly the same extent. Moreover, construction equipment manufacturers grew rapidly in response to domestic demand, rather than through exports to advanced country markets. For these reasons, “the growth of the construction equipment industry - and heavy machinery in general - has been more organic. A relatively comprehensive domestic supply chain has emerged” (EIU 2011).

A recent study by CLSA, a broker and investment group, tested a range of Chinese-made excavators and found them to be dependable and high-performing, suggesting that leading Chinese brands such as Sany, Zoomlion and Liugong are likely to increase their presence on building sites across the globe. The onset of the global financial crisis proved to be a turning point for Chinese domestic construction machinery firms. Prior to the crisis, it is estimated that roughly 90 per cent of excavators on Chinese construction sites were foreign-branded, but often made in China. The government’s massive fiscal stimulus in 2008-2009 (while advanced countries saw sinking equipment sales) led to a construction boom that procured construction machinery from Chinese makers and allowed them to further expand. According to one account, $250m in government subsidies went to Sany and $50m went to Zoomlion during 2011-2012. While domestic Chinese firms still lagged foreign firms in terms of technical know-how, Chinese firms offered buyers such generous financing and discounts that by 2011 their excavators held a 41.1 per cent share of the domestic market, which grew to over 50 per cent in 2012 (see Figure 6).15

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FIGURE 6: CHINA DOMESTIC EXCAVATOR MARKET SHARE TRENDS, 2010-2012 (BY QUARTER)


The CLSA study subjected foreign- and domestic-branded made-in-China excavators from six companies, namely Sany, Caterpillar, Doosan, Hitachi, Komatsu and Kobelco, to two weeks of robust tests of their productivity, durability and fuel efficiency. The results indicated that Sany’s performance was not quite as good as the best, made by Caterpillar, but outperformed their Japanese and South Korean rivals. The study concluded that technology gaps, particularly in the medium-sized 20-24.9 tonne weight class, between the best Chinese firms and their foreign rivals are now “almost non-existent”, and the CLSA expects that Sany and other larger Chinese brands will lead a consolidation drive of the domestic industry. As shown in Table 2 below, it is the medium-sized 20-24.9 tonne weight class (shaded rows) that accounts for the greatest share of Chinese excavator exports, combining for 46.8 per cent and 57.6 per cent of the total in 2011 and 2012, respectively.

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TABLE 2: CHINA EXCAVATOR EXPORTS, BY WEIGHT CLASS, 2011-2012

<table>
<thead>
<tr>
<th>Weight (tonnes)</th>
<th>2012</th>
<th>2011</th>
<th>Year-on-Year Change (%)</th>
<th>Change in Share (percentage points)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;6</td>
<td>787</td>
<td>853</td>
<td>-7.7</td>
<td>-9.0</td>
</tr>
<tr>
<td>6 to 10</td>
<td>485</td>
<td>320</td>
<td>51.6</td>
<td>1.1</td>
</tr>
<tr>
<td>10 to 15</td>
<td>665</td>
<td>344</td>
<td>93.3</td>
<td>0.7</td>
</tr>
<tr>
<td>20</td>
<td>873</td>
<td>174</td>
<td>401.7</td>
<td>7.1</td>
</tr>
<tr>
<td>21</td>
<td>2046</td>
<td>1162</td>
<td>76.1</td>
<td>-0.2</td>
</tr>
<tr>
<td>22</td>
<td>1697</td>
<td>785</td>
<td>116.2</td>
<td>3.9</td>
</tr>
<tr>
<td>25</td>
<td>256</td>
<td>95</td>
<td>169.5</td>
<td>1.1</td>
</tr>
<tr>
<td>30</td>
<td>140</td>
<td>154</td>
<td>-9.1</td>
<td>-1.7</td>
</tr>
<tr>
<td>35</td>
<td>908</td>
<td>456</td>
<td>99.1</td>
<td>1.2</td>
</tr>
<tr>
<td>40</td>
<td>164</td>
<td>187</td>
<td>-12.3</td>
<td>-2.1</td>
</tr>
<tr>
<td>Total</td>
<td>8021</td>
<td>4530</td>
<td>77.1</td>
<td></td>
</tr>
</tbody>
</table>

Source: China Construction Machinery Industry Association (2013:37).

A spate of acquisitions of foreign companies in recent years, some struggling from the economic downturn in advanced countries, has provided further upward lift to technology upgrading and export diversification by Chinese firms in the construction machinery sector. For instance, in April 2012, state-owned Xuzhou Construction Machinery Group (XCMG) purchased a majority stake in Schwing, one of Germany’s leading high-end concrete pump makers. In January 2012, Sany Heavy Industry acquired 90 per cent of Germany’s Putzmeister, also an upmarket concrete pump maker based in the Mittelstand. In February 2012, Guangxi Liugong Machinery purchased Poland-based Huta Stalowa Wola (HSW), a manufacturer of bulldozers and other crawler machines. In September 2012, Shandong Heavy Industry acquired a 20 per cent stake in German forklift company Kion Group and a 70 per cent stake in Kion’s hydraulics business. In December 2013, Zoomlion Heavy Industry acquired leading German producer of dry mortar, M-TEC. This deal follows the 2009 purchase of a 60 per cent majority stake in Compagnia Italiana Forme Acciaio (CIFA), a leading concrete equipment manufacturer. By January 2013, Zoomlion had purchased the remaining shares of CIFA from Goldman Sachs and other investors, reportedly funding the deal off its balance sheet.17

China’s rise in heavy equipment certainly remains a work in progress, but in terms of SSC it is important to note that the higher-value capital goods that most developing countries are already importing, mainly from OECD countries, are those very same economic sectors in which Chinese manufacturers are increasingly building capacity. Table 3 provides a sense of these trends, where OECD countries’ global export share in HS-8429 has fallen from 93.54 per cent to 80.35 per cent from 2001 to 2012. Over that same period, China’s exports in this category have grown rapidly from 0.66 per cent to 9.40 per cent, roughly equaling South Korea’s (growing) global export share. As mentioned above, only 10.8 per cent of China’s exports in this category were destined for OECD markets in 2012.) While other selected emerging countries also saw their global export shares rise quickly (except Russia), their global shares remain below half of one per cent. The exception is Brazil, which saw its share almost double from 2.26 per cent to 4.16 per cent.

Although China’s increased competence in excavators represents only one product category within construction machinery, not to mention one among a large number of overall machinery and other capital goods categories, these trends provide a glimpse of China’s current technology and economic development trajectory. Further research is needed to confirm the scope and depth of these trends, but the findings in this section imply that a wider Chinese “big push” in capital goods is certainly possible, if not in progress across a range of sectors (Lang et al. 2012, Bouffault et al. 2011, Alberts & Ting 2010, Alberts et al. 2010, Price et al. 2010). Similarly, the OECD (2010) has already hinted at some of the possible South-South development implications: “Such a downward shift in the relative price of capital goods could represent a major growth payoff from the expansion of India and China for the world economy as a whole, but especially for low-income countries where prices for capital goods have historically been excessively high.”

Although Chinese technological indigenous capabilities are generally still relegated to lower-end market segments that appeal to cost-conscious consumers in many of these capital goods (and other) sectors, the discussion presented above also speaks to the increasing momentum of Chinese producers in upgrading product quality and dependability. As occurred in other East Asian cases, it is not uncommon for new market entrants to seek to capture entry-level consumers based on price and try to expand from this base as the brand evolves over time (Tse et al. 2009a). Indeed, it is this upgrading imperative of Chinese domestic producers that some suggest will lead to a battle for fast-growing “middle-market” segments in emerging countries, where customers demand more sophisticated products than those traditionally offered by low-cost Chinese producers, yet less sophisticated and costly than those high-end market segments dominated by foreign companies (Brandt & Thun 2010, Lang et al. 2012, Tse et al. 2009c:2-4). The country case below discusses more concretely how China’s process of industrial upgrading could have potentially dynamic knock-on effects on other developing countries.

### Country Case: China and Oil Refining in Nigeria

The lower pricing points for capital goods (and for industrial financing) could have transformative impacts for other developing countries in light of China’s apparent willingness to invest in value-added activities, like processing and refining projects. Viewed as an “uneconomic” proposition by traditional investors, such projects often experience challenges in securing long-term financing, but from the Chinese side are considered

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**TABLE 3: GLOBAL EXPORTS SHARES OF HS-8429 SELF-PROPELLED BULLDOZER, ANGLEDZER, GRADER, EXCAVATOR, ETC. (%), 2001-2012**

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>World</td>
<td>13.93</td>
<td>15.03</td>
<td>19.50</td>
<td>25.51</td>
<td>30.66</td>
<td>36.91</td>
<td>47.50</td>
<td>52.19</td>
<td>23.84</td>
<td>36.80</td>
<td>51.83</td>
<td>51.95</td>
</tr>
<tr>
<td>OECD</td>
<td>93.54</td>
<td>93.38</td>
<td>90.28</td>
<td>89.74</td>
<td>88.40</td>
<td>87.54</td>
<td>85.17</td>
<td>81.88</td>
<td>81.56</td>
<td>81.75</td>
<td>80.35</td>
<td></td>
</tr>
<tr>
<td>South Korea</td>
<td>4.20</td>
<td>4.74</td>
<td>5.52</td>
<td>5.76</td>
<td>5.96</td>
<td>6.40</td>
<td>6.34</td>
<td>5.95</td>
<td>5.15</td>
<td>7.64</td>
<td>8.93</td>
<td>9.08</td>
</tr>
<tr>
<td>China</td>
<td>0.66</td>
<td>0.54</td>
<td>0.46</td>
<td>1.06</td>
<td>1.55</td>
<td>2.74</td>
<td>3.88</td>
<td>5.30</td>
<td>6.40</td>
<td>6.09</td>
<td>7.48</td>
<td>9.40</td>
</tr>
<tr>
<td>Brazil</td>
<td>2.26</td>
<td>2.23</td>
<td>2.15</td>
<td>3.36</td>
<td>3.85</td>
<td>3.72</td>
<td>3.06</td>
<td>3.27</td>
<td>2.49</td>
<td>3.67</td>
<td>4.19</td>
<td>4.16</td>
</tr>
<tr>
<td>South Africa</td>
<td>0.20</td>
<td>0.17</td>
<td>0.15</td>
<td>0.17</td>
<td>0.20</td>
<td>0.24</td>
<td>0.32</td>
<td>0.40</td>
<td>0.48</td>
<td>0.43</td>
<td>0.41</td>
<td>0.46</td>
</tr>
<tr>
<td>Russia</td>
<td>0.56</td>
<td>0.44</td>
<td>0.37</td>
<td>0.34</td>
<td>0.47</td>
<td>0.50</td>
<td>0.53</td>
<td>0.48</td>
<td>0.60</td>
<td>0.36</td>
<td>0.24</td>
<td>0.41</td>
</tr>
<tr>
<td>Indonesia</td>
<td>0.08</td>
<td>0.12</td>
<td>0.16</td>
<td>0.19</td>
<td>0.29</td>
<td>0.42</td>
<td>0.30</td>
<td>0.21</td>
<td>0.27</td>
<td>0.32</td>
<td>0.33</td>
<td>0.39</td>
</tr>
<tr>
<td>India</td>
<td>0.03</td>
<td>0.01</td>
<td>0.04</td>
<td>0.07</td>
<td>0.06</td>
<td>0.04</td>
<td>0.08</td>
<td>0.14</td>
<td>0.39</td>
<td>0.17</td>
<td>0.31</td>
<td>0.30</td>
</tr>
<tr>
<td>Turkey</td>
<td>0.18</td>
<td>0.12</td>
<td>0.11</td>
<td>0.07</td>
<td>0.07</td>
<td>0.11</td>
<td>0.18</td>
<td>0.21</td>
<td>0.31</td>
<td>0.21</td>
<td>0.20</td>
<td>0.25</td>
</tr>
</tbody>
</table>

Source: ITC.

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18 Other broad machinery sectors are: agricultural machinery, machine tools, basic components of machinery, heavy machinery, power generating machinery, petrochemical general machinery, auto machinery, instruments, office supply machinery, food and packaging machinery, and others (EUSME Centre 2011).
from a longer-term investment perspective. China’s offer to build the refineries is linked to gaining a strategic edge over commercial rivals in winning access to oil reserves, but not surprisingly aspects of the bid play to its strengths: from China’s relative ease of access to capital to its (over)capacity in some of these heavy industry projects, both of which stem from China’s current development stage of investment-led growth.

In May 2010 the China State Construction Engineering Corporation (CSCEC) signed a Memorandum of Understanding with the state-owned Nigerian National Petroleum Corporation (NNPC) agreeing to spend up to $23bn to build three greenfield oil refineries and a petrochemical plant in Nigeria as part of China’s efforts to secure 6bn barrels of crude oil reserves. According to the US Energy Information Administration (EIA), Nigeria is Africa’s largest oil producer at 2.5m barrels per day (bpd) in 2012, 89 per cent of which was exported. In contrast, consumption of petroleum products amounts to an equivalent of 0.27m bpd, but with refineries running at an average capacity utilization of only 20 per cent in the last few years, Nigeria imported roughly 76 per cent of petroleum products in 2011, including premium motor spirits (petrol), automotive gas oil (diesel), and dual purpose kerosene (NRSTF 2012:7,17). The EIA estimates that Nigeria imported about 85 percent of its demand for petroleum products in 2009.20

In light of this high proportion of fuel imports, the cost of providing fuel subsidies in Nigeria has fluctuated in recent years, but remains at an elevated level. According to some estimates, as international fuel prices rebounded in 2011, the estimated cost of Nigeria’s fuel subsidy was about $9.30bn, up from $4.31bn in 2010, $3.01bn in 2009 and $5.17bn in 2008 (AfDB 2012). According to the Central Bank of Nigeria, government capital expenditure in 2011 was $5.94bn (or N918.5bn) equivalent to 2.6 per cent of GDP, and which accounted for 19.5 per cent of total government expenditure, and 25.8 per cent of total federal government revenue. In 2010, the government’s capital expenditure amounted to $5.88bn (or N884.02bn) (CBoN 2011:111). Due to limited refining output, the government’s fuel subsidy was about 1.6 times the amount of its capital expenditure in 2011, and in 2010 the government’s fuel subsidy bill was equivalent to 73 per cent of its capital expenditure.

Domestic improvements in the production of petroleum products — gaining a degree of self-sufficiency — would presumably provide a fair degree of “policy space” for the Nigerian authorities by freeing up financial resources that could be reallocated from fuel subsidies to other development objectives such as infrastructure and social services. Ultimately, however, the deal has been derailed by the 2013 announcement that Africa’s wealthiest individual, Mr Aliko Dangote, will invest $9bn in a new refinery. His conglomerate already operates in sectors from concrete and construction to sugar, salt and other consumer staples, and it has been argued that as an insider with the highest political connections, Mr Dangote is far better placed than Chinese companies to navigate the complex web of entrenched political-economic interests and to absorb political risks related to market deficiencies and institutional voids.23

Since the issue of Nigeria’s deficits in oil refining is not exactly new, the timing of Mr Dangote’s investment decision is curious. In a recent interview, Mr Dangote has said his company’s strong balance sheet and the sector’s capital-intensive nature explain his interest in the oil refining business, but it is also worth pointing out that some of his existing businesses, such as in concrete, are also large users of fuels and petroleum products.

21 Using the average exchange rate for 2011 of $1:N154.75.
22 Using the average exchange rate for 2010 of $1:N150.30.
Mr Doyin Okupe, senior assistant to Nigerian President Goodluck Jonathan, believes the Dangote deal will “change the economic and industrial landscape of Nigeria”\(^{25}\) and although the CSCEC-NNPC deal now appears sidelined, the case reveals perhaps three key points: i) a sense of the potentially transformative opportunities for host economies of strategic bilateral Chinese trade and investment flows; ii) that despite the benefits, such agreements are not assured and still require hard-nosed negotiation; and more controversially, iii) the possible reaction to competitive pressures placed on local (and foreign) private entrepreneurs and investors from these (potential) arrangements.

5. STATE CAPITALISM MEETS MONOPOLY CAPITALISM

Of course, any advances made by Chinese firms up the industrial value chain (and the resulting impacts on SSC) must also be reconciled with the very clear trend toward greater industry consolidation, through mergers, acquisitions and FDI, of a limited number of globally dominant businesses that are primarily based in developed countries. In a paper assessing the pros and cons of the “Beijing Consensus”, Williamson (2012) added an important caveat to the “Washington Consensus” policy package by critiquing the concentrated form of capitalism that prevailed in advanced countries in the lead-up to the financial crisis:

“One should surely distinguish monopoly capitalism from free-market capitalism. It is true that the Washington Consensus, as first articulated by this author, endorsed privatization as a policy, and clearly this stance is as antithetical to state capitalism as to socialism. But privatizing in order to replace a nationalized industry with a private monopoly is not what I had in mind (Williamson 2012:9).\(^{26}\)

Nonetheless, this process of consolidation has taken place across a wide range of sectors, from high-tech products to branded consumer goods and capital goods, to financial services: sectors where a huge increase in global output was accompanied by a reduction in the number of leading firms in many industrial sectors. Indeed, not only do Chinese (and other emerging economy) firms have to catch up to lead firm “system integrators” at the apex of GVCs that possess superior technologies and powerful brands, but also with other powerful supplier firms “that now dominate almost every segment of global supply chains” (Nolan & Zhang 2010).

For instance, using data from 2006-2009, the number of system integrator firms in the manufacture of large commercial aircraft was two; of mobile telecommunications handsets and infrastructure, three (each); of pharmaceuticals, ten; and of construction and agricultural equipment, four and three respectively. In these cases, these firms held between half and all of global market share, except in the case of the four construction equipment firms which held 44 per cent of global market share. Similar trends hold across many industries for major component firms that supply the system integrators, as well as in the expenditure of corporate research and development (R&D) resources.

This high degree of industry concentration reinforces the enormous competitive challenges faced by Chinese “national champion” firms in catching up to the technological frontier and challenging head-on the world’s leading MNCs. Some might dismiss China’s support for its firms as a throwback to a pre-globalization mindset, but a more candid (post-financial crisis) perspective suggests that China’s concerns are not misplaced: “Companies still have national attachments that shape how they behave and, in particular, their role in developing a particular country’s competences.”\(^{27}\) Given the well-known barriers that limit the possibility of

\(^{25}\) Hinshaw, Drew (2013). “Africa’s richest man bets big on oil refinery”, Wall Street Journal, December

\(^{26}\) It is perhaps no coincidence, as Nolan and Zhang (2010) pointed out, that “companies headquartered in the high-income countries were in prime position to benefit from the liberalization of international economic relations that was at the heart of the Washington Consensus.”

upgrading in GVCs (Park et al. 2013:84-6), the Chinese government’s ambitious industrial policy goals would be even harder to achieve, if not utterly impossible, if it was not consciously (and sometimes creatively) making use of key policy instruments to further its goals. As the Chairman of the United States Export-Import Bank forcefully argued,

*Believe me, China and other countries will not be shy about using any tool – as much as they can and for as long as they can – to put their people to work. State-owned enterprises, sovereign wealth funds, state-directed capital – they will leverage every single one in an attempt to outcompete us* (Hochberg 2012).

Table 4 below provides a convenient overview of some of the main industrial policy instruments deployed by Chinese policy-makers. Missing from Table 4, however, is a key consideration that makes China’s industrial strategy resonate with that of Japan and the first-tier NICs (and distinctive from that of other developing countries); China’s unorthodox ability to better align macroeconomic policies as part of a broader development strategy (such as microeconomic sectoral policies) in contributing directly to long-term growth. First, fiscal policies have prioritized development spending, particularly investment in infrastructure and education, along with subsidies to export industries. Second, monetary policy was integrated with banking/financial sector and industrial policies, including directed credit and favourable interest rates in order to directly influence investment and savings behaviour. Meanwhile, a competitive exchange rate was considered as indispensable to encouraging exports and export diversification (Ocampo & Vos 2008:41, Yu 2008, El-Erian & Spence 2008, Flasbeck 2005).

**TABLE 4. CHINA’S INDUSTRIAL POLICY TOOLBOX: OVERVIEW**

<table>
<thead>
<tr>
<th>Explanation</th>
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<tbody>
<tr>
<td><strong>Fiscal Incentives</strong></td>
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<td><strong>Grants</strong></td>
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<tr>
<td><strong>Financial Support</strong></td>
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<tr>
<td><strong>FDI Guidelines</strong></td>
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<tr>
<td><strong>Government Procurement</strong></td>
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<tr>
<td><strong>Standards</strong></td>
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<tr>
<td><strong>Human Resources</strong></td>
</tr>
<tr>
<td><strong>Infrastructure Projects</strong></td>
</tr>
</tbody>
</table>

*Source: Ahrens (2013).*
Thus, while it is not uncommon to find other developing countries with a similar set of industrial policy instruments and sector-specific strategies, it is the Chinese government’s relatively strong financial position combined with strong macroeconomic fundamentals that make its various industrial policy instruments and sectoral strategies all the more credible and viable. Below, three examples are briefly provided to illustrate the strategic nature of China’s competitive advantage in its “ability and willingness to invest” (Porter 1990) the capital resources it has painstakingly accumulated:

- In September 2007, the government created the China Investment Corporation (CIC), a sovereign wealth fund that was initially provided $200bn from the country’s foreign exchange reserves (now with $500bn)\(^{28}\). Officially, the CIC is to make long-term investments that maximize the risk-adjusted financial returns to its shareholder, the State Council, by diversifying investment into a wider range of assets including equities, bonds and hedge funds. However, it is likely that CIC’s mandate includes strategic aspects such as managing China’s investments in its domestic state banks, supporting outward expansion of Chinese firms, and managing China’s external investment portfolio that will be more diversified than China’s foreign exchange reserve portfolio. In November 2007 the CIC assumed the responsibility for the assets and liabilities of the Central Huijin Investment Limited, which is a major stockholder in China’s state-owned commercial banks, policy banks, and other joint-stock financial institutions (Martin 2010).

- In February 2008 the combined $13bn effort by Chinalco and Alcoa to buy 9 per cent of Rio Tinto’s outstanding shares was a bid to thwart the acquisition of Rio Tinto by BHP Billiton that would have further enhanced BHP’s pricing power over iron ore, a key input for steel-making. The investment by Chinalco did not draw on financing from CIC, but Chinalco did receive loans from the China Development Bank (CDB), which was recapitalized with $20bn from the CIC in December 2007. In return, CIC received a large equity stake and as of end 2009, CIC held a 48.7 per cent equity stake in CDB (Martin 2010, Setser 2008). In a separate deal in 2010 Chinese automaker Geely acquired Swedish automaker Volvo for $1.8bn, where the Volvo technology and engineering capabilities were key aspects for Geely. To finance the deal, Geely secured $2.1bn in loans from Bank of China, China Construction Bank, Export-Import (Exim) Bank of China, Geely Automobile Holdings (the group’s listed arm) and the government of Gothenburg (where Volvo is headquartered)\(^{29}\).

- In the construction machinery sector, benefitting from a large government stimulus package and industry-specific plans (the latest issued in 2009) that included an array of measures from value-added tax, procurement, and R&D preferences, to financial incentives to promote the restructuring and merging of domestic firms, among others (Poon 2012:46), cash-flush Chinese firms not only gained domestic market share from foreign rivals, but also opportunistically acquired leading European construction machinery firms, many of which faced financial difficulties with the advent of the global financial crisis and the subsequent European debt crisis\(^{30}\).

With regard to the XCMG-Schwing deal\(^ {31}\) in support of “going global” projects by Chinese companies, the Industrial and Commercial Bank of China (ICBC) arranged a €160m international loan syndication to finance the deal. Both international and Chinese banks joined in the loan syndication, including the China Development Bank.\(^ {32}\) In the case of Zoomlion, its 2012 annual report shows that the Hunan provincial government’s SASAC is the company’s largest shareholder with a 16.2 per cent stake, although other small equity stakes are held by


\(^{31}\) It should be noted that US private equity firm, the Carlyle Group’s attempt to acquire a majority stake in XCMG in 2005 was ultimately blocked by the Ministry of Commerce (Mofcom) (Poon 2012).

Chinese investment groups, such as Hony Capital Fund, which was involved in both the CIFA and M-Tec deals (Zoomlion 2012:12). The Sany-Putzmeister deal was worth €525, and was reportedly financed straight off of Sany’s balance sheet. Sany is a private company, although the founder and Chairman of the board of directors, Mr Liang Wengen, was elected a representative to the 17th CPC National Congress, and was a representative of the 8th, 9th, and 10th National People’s Congresses. The deal’s remaining 10 per cent equity was bought by CITIC PE Advisors (Hong Kong) which is an affiliate of CITIC Group Corporation, a wholly state-owned company.

By integrating macroeconomic policies as part of a broader development framework, Chinese policy-makers are attuned to the idea that there is room for manoeuvre within the confines of the multilateral trading system, such as in areas of industrial tariffs and subsidies (including export credits), intellectual property rights, state enterprises, and services (Akyuz 2009:4, Weiss 2005b:731-2). In addition, Beijing also appears to be well aware of significant room for manoeuvre in policy areas outside of, or not comprehensively covered by, multilateral disciplines, including in the choice of exchange rate and capital account regimes, in the so-called “Singapore issues” of investment, competition policy, government procurement, and in other areas such as labour and environmental standards, among others (USTR 2014:59-70, Drake 2014, Koch-Weser 2014, Howell 2007:86-91).

China’s multi-faceted “indigenous innovation” initiative is a good example of China’s creative blending of industrial policy instruments. Formally introduced in 2006, the initiative links government procurement preferences to products whose intellectual property rights are owned and originally trademarked in China. Other aspects include active support for Chinese technological standards that are bestowed to state-owned or state-backed enterprises, increased research and development spending in targeted sectors, and the trading of domestic market access to foreign firms based on their willingness to share technology. Since MNCs are often reluctant to physically locate their latest technologies in China for fear of knowledge leakages to domestic commercial rivals, some critics liken the indigenous innovation initiative as little more than an elaborate attempt at forced technology transfer (Segal 2011, Suttmeier & Yao 2011, Chai et al. 2011).

With the rise of so-called “covert protectionism” that falls outside the WTO’s narrower definition for traditional protectionism, there appears to be growing recognition that the main barriers to a borderless world are no longer tariffs, but a wide range of different behind-the-border policies and regulatory standards (Evenett 2013). However, from the discussion above, the ability to identify and use these policies and standards to bolster the state’s strategic bargaining position is precisely the tactic coaxing China’s move up the industrial value chain over the longer term. As UNIDO (2013) has argued,

“As trade policy is a key component of any industrial policy, the current policy space (such as under WTO rules) may need to be fully assessed and taken advantage of, or recovered if needed to promote structural change, particularly in developing countries” (UNIDO 2013:140). Indeed, China’s bold policy strategy has not gone unnoticed and some other emerging countries have already started adopting their own indigenous policy initiatives, albeit crafted to their own objectives and circumstances (Garfield 2012:8).

35 See CITIC Group Corp. website: http://www.citicgroup.com.cn/wps/portal/ru/p/b1/04_SjCPykssoyOFLmMzDvMAGqjOK9wsczLvLdDqoM9Xc wMDTz9PBwNgwM0DJWfD0LSh0VAebeBA/?lctn=1&flag=11
38 Or put less eloquently, one US industry lobbyist opined, China “has thoroughly examined all the [loop]holes in the WTO system and it is working to drive trucks through those holes”. (Ottowatt, Scott (2010). “China defends innovation policy, but U.S. industry wants overhaul”, Inside US-China Trade, March 3.)
Past research efforts have attempted to catalogue, to varying degrees, China’s extensive use of industrial and sectoral policies (CSIS 2013, Lin & Milhaupt 2013, Zhang 2013, Dinh et al. 2013, Haley 2012, Cliff et al. 2011, Ernst 2011, Price et al. 2010, Howell et al. 2010, Dahlman 2009, Poon 2009, Stewart et al. 2007, Rosen & Houser 2007, Pearson 2005). Given the attention of this section on the challenges to China’s industrial policy ambitions posed by the high degree of global corporate industrial concentration, a special focus examining China’s evolving competition policy (such as anti-monopoly, anti-trust) regime would seem a fitting litmus test of China’s overall industrial policy orientation and potential room for manoeuvre.

6. ANTI-MONOPOLY WITH CHINESE CHARACTERISTICS

Following thirteen years of deliberation, China’s first comprehensive anti-monopoly law (AML) came into force in August 2008. Since then, China has quickly emerged as an important anti-trust jurisdiction both for domestic companies and for MNCs with activities in China. Since its enactment in 2008, various drafts of implementing rules have been devised to provide further guidance and clarity on the broad legal framework established in the AML, covering the main areas of: 1) rules prohibiting restrictive (horizontal, vertical) agreements and the abuse of a dominant market position; 2) merger rules to control large M&A activity and prevent mergers that restrict competition; and 3) rules prohibiting the abuse of administrative power that leads to restrictions on competition (Norton Rose 2012, Poon 2009).

Although the various elements of implementing rules have shown a degree of convergence between Chinese AML rules and international anti-trust norms, particularly as Chinese anti-monopoly agencies gain more experience, some practitioners worry that factors such as industrial policy, protectionism and employment effects have unduly influenced aspects of AML implementation (Sokol 2014, Tucker 2013).

Recently the State Administration for Industry and Commerce (SAIC) issued the sixth draft of “Rules on the Prohibition of Abuses of Intellectual Property Rights for the Purposes of Eliminating or Restricting Competition” (the Draft IP Rules) which still contain a number of controversial provisions surrounding firms with a dominant market position and which is likely to have a major impact on intellectual property rights (IPRs) licensing and technology transfer practices in China.

Under the Draft IP Rules, companies with a “dominant market position” are prohibited from certain types of behaviour in exercise of their IPRs that result in abuse of that market power. A dominant market position is defined as the ability of a firm to control the price, quantity or other trading conditions in the relevant market, or to obstruct or affect the entry of another firm into the relevant market. Three key non-exhaustive types of behaviour are identified that will be considered by the SAIC as an abuse of a dominant market position: 1) discriminatory refusals to license, or a refusal to license essential IPRs; 2) unjustified tie-in/bundling clauses; and 3) attaching unreasonable trading conditions to an IPR agreement.

On the one hand, the removal of the language prohibiting “unreasonably high pricing” on IPR licensing has been removed from this draft after being criticized for effectively introducing price regulation into the market. At the same time, however, the Draft IP Rules maintain that companies with a dominant market position are prohibited for refusing to license IPR in an unequal and discriminatory manner and without

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40 Unless otherwise indicated, this section is based on Han and Bird (2013).
42 The SAIC is one among the four main Chinese antimonopoly enforcement institutions. The others are the Antimonopoly Commission (reporting to the State Council), the Ministry of Commerce (MOFCOM), and the National Development and Reform Commission (NDRC). These institutions are mandated with different aspects of antimonopoly enforcement, with the SAIC responsible for enforcing the rules and the prohibition on the abuse of administrative power in relation to non-price-related matters (Norton Rose 2012).
justification. Moreover, the Draft IP Rules appear to introduce the application of an ‘essential facilities doctrine’ IPR regulation in China. Under the current draft, the essential facilities doctrine will prohibit a dominant firm’s refusal to license IPR:

- where the IPR is necessary for the licensee to compete in the relevant market and cannot in practice be avoided;
- where the refusal will render the licensee unable to compete effectively in the relevant market; and
- where the refusal will have an adverse impact on competition and innovation, making it impossible to satisfy consumer demand in the market.

Importantly, the approach used in these clauses of the Draft IP Rules is significantly broader than in related provisions found in anti-trust laws in the European Union and the United States. In the EU’s case, the refusal to license by a dominant firm will only be prohibited in “exceptional circumstances”, generally limited to a refusal by a dominant firm in an upstream market to license IPR without objective justification: 1) where it is indispensable to the emergence of a new product in a secondary market; and 2) where the refusal excludes competition in that secondary market.

In the United States, judicial courts have been cautious in applying the essential facilities doctrine to refusals to license IPR and have generally limited its application to market dominant positions of secondary downstream markets. By comparison, China’s Draft IP Rules focus on the “relevant market”, which could also include a market at the same level or segment in the supply chain. A policy briefing by the law firm Freshfields Bruckhaus Deringer contemplates the following possibility:

*Equally there is no requirement in the Draft IP Rules that the refusal to license prevents the emergence of a new product, only that consumer demand is not met. This could include consumer demand for an existing product. The provision is therefore troubling in that it remains open as to whether companies in China could force a dominant competitor at the same level to license essential IPR so that it can then use that IPR to produce the same product as the licensor and compete directly against him. Much will depend on the definition of the market in any individual case (Han & Bird 2013).*

Ultimately, it remains to be seen how China’s anti-trust regime and implementation will evolve, but Chinese authorities have shown increasing self-confidence and have intensified their efforts on domestic firms and MNCs. Beijing’s enforcement activism has recently included handing out stiff penalties against manufacturers of infant milk powder, liquid crystal display panel and liquor price-fixing, and a wide ranging investigation into graft and price-fixing in the pharmaceuticals industry, among other actions.43

In a speech in Beijing in July 2013, Maureen Ohlhausen, Commissioner at the Federal Trade Commission (FTC), signalled her government’s increasing concern over apparent Chinese anti-trust targeting of foreign investors. Commissioner Ohlhausen promoted an anti-trust philosophy of “regulatory humility”, while arguing for greater transparency in Chinese anti-trust practices. She also argued that “political decisions” involving considerations of industrial policy, national security, employment, and other issues have no place in an anti-trust agency’s decision-making process (Ohlhausen 2013). While the remarks are viewed as unprecedented for a sitting FTC commissioner, American officials have also generally been reluctant to confront China over anti-trust rules,44 which likely bodes well from a Chinese policy space perspective.

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Perhaps United States officials have good reason to proceed cautiously in areas closely connected to China’s domestic regulatory policy, such as anti-monopoly policy. On the one hand, China’s state-led economic governance model, for all the criticism of corruption and inefficiencies, proved useful in response to the 2008-2009 financial crisis when its vigorous stimulus package was critical to reflating the global economy (Yu 2010). With some irony, Jim O’Neill, Chairman of Goldman Sachs Asset Management, called China’s crisis response, “in some ways, sort of peculiar ways, an act of God” (Chatham House 2012:13). On the other hand, United States officials may also realize that the government’s control mechanisms go deeper than ownership of state assets and cat-and-mouse games over regulations. Over the course of reforms, the Chinese Communist Party has retained its influence by keeping control over all senior appointments using its human resources arm, the Central Organization Department, and through such personnel, the ruling party can directly influence corporate and social policy (McGregor 2010:68). It would be an oversimplification to treat the Chinese government as a monolithic entity, but that is not to say that the state is internally riven across all issues. Perhaps the best way to get a sense of the scale of the state’s societal influence is to conjure up an imaginary parallel body in Washington:

A similar department in the US would oversee the appointment of the entire US cabinet, state governors and their deputies, the mayors of major cities, the heads of all federal regulatory agencies, the chief executives of GE, Exxon-Mobil, Wal-Mart and about fifty of the remaining largest US companies, the justices on the Supreme Court, the editors of the New York Times, the Wall Street Journal, and the Washington Post, the bosses of the TV networks and cable stations, the presidents of Yale and Harvard and other big universities, and the heads of think-tanks like the Brookings Institution and the Heritage Foundation (McGregor 2010:72).

7. CONCLUDING REMARKS: CAN CHINA BE LEVERAGED?

China clearly has yet to attain sufficient production capacities in all of the five key sectors to anchor Lewis’ vision of self-sustaining growth in the South, but observable progress is being made in medium technology capital goods, particularly in machinery equipment sectors. That China is still in the process of upgrading its productive capacities and carrying out its industrial policy ambitions is of primary strategic relevance to many developed country governments and firms, and inextricably linked to assessments of their bargaining power vis-à-vis China’s economy and domestic firms. On this front, Chinese authorities seem adept at utilizing policy levers to strengthen their power at the bargaining table.

The strategic relevance is perhaps even greater for other developing country governments and firms, in light of China’s continuing developing country status and the common catch-up development objectives that entails. Though most developing country firms do not possess the technological and managerial expertise to leverage against China, most do hold valuable bargaining chips in various guises related to natural resources, access to markets, geographical location and logistics, and some human capital, not to mention other areas related to geo-political, diplomatic and military interests that can also be carefully considered. Even some “David vs. Goliath” cases have already emerged, notably in Mongolia and Myanmar for example. In these

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45 Of course, the negative aspects of China’s large stimulus package and the institutional channels through which it was implemented are now appearing in the form of a debt overhang and the build-up of credit risk in the country’s shadow banking sector. To this, O’Neill suggests two major differences to China’s policy approach in dealing with a possible banking crisis: first, he recognizes that Chinese economic policy-makers have shown a willingness to use policy measures to deliberately try to stop and discourage rising housing property prices; second, Chinese officials realize that inflation targeting might be necessary but not sufficient, and maintain quite strong controls on overall monetary indicators (Chatham House 2012:14). Other analysts would seem to concur with this view. See Roach, Stephen S. (2012). “Beijing’s lessons for central banks”, Financial Times, March 5, Li, David Daokui (2012). “My lessons from life as a Chinese central banker”, Financial Times, May 9; Yu Yongding (2014). “Taming the China bears”, Project Syndicate, April 15. See http://www.project-syndicate.org/commentary/yu-yongding-argues-that-predictions-of-a-hard-economic-landing-are-largely-unwarranted#TIpDzdy5WVEdSti.99

cases, the smaller country Pressed its demands on China (with varying degrees of efficacy) which could also lead to spillover effects on other foreign investors.

The trick for developing countries, perhaps, will be a shift in the perception of their own bargaining power on the narrow basis of bilateral relations, to a “triangular” (or “multi-nodal”) concept that deliberately yet carefully recognizes the heightened competitive nature that exists between a host country’s respective bilateral partners, say, China and the United States / European Union. This is already apparent in some cases, such as when foreign investors compete to gain access to natural resources, or when leaders pronounce a “look east” foreign economic policy, or over security/political issues, such as diplomatic recognition related to Taiwan (China). In this regard, Singapore is perhaps a good case study, having both strong economic and political ties to China, while regularly hosting the United States navy. When asked about China’s reaction to Singapore’s outspoken support for United States military presence in the Pacific Ocean, Prime Minister Lee Hsien Loong replied: “They don’t like it, but they understand it.”

In light of China’s stage of industrialization, however, developing countries may be able to garner more lasting economic benefits in bilateral negotiations by showing a degree of cognizance of Beijing’s own strategic industrial policy goals and efforts to gain any edge over advanced country MNCs (and vice versa for other foreign investors concerned about competition from China and other emerging countries). In return, developing countries should sharpen their demands to stress enhanced opportunities for learning, technical progress, investment and ultimately structural change in their own domestic economies. In short, a “triangular” approach could allow a host country to more effectively play foreign investors off of each other, which is of course akin to China’s own approach to foreign investors across a variety of sectors seeking access to its domestic market.

It is also important, in the longer term, for developing countries to benefit from trying to make use of policy spaces that China has carved out for itself and, to some extent, legitimized within the global economic governance system in light of its newfound economic heft. Concepts such as “industrial policy”, “indigenous innovation” and “state capitalism” were not invented by China, but have regained policy cogency mainly because China has convincingly demonstrated how they can effectively contribute to growth, poverty reduction, and development. It is not far-fetched to suggest that Beijing would have much less of a governance problem, at least on pure ideological grounds, in cooperating with other SOEs on joint projects, for example, or conducting “less ambitious” free trade agreements (Wise 2012) or even contemplating strategic barter trades should other developing countries decide to more aggressively pursue such alternative options as part of their developmental strategies. Even some advanced economies have taken advantage of China’s policy flexibility, as witnessed in a “creative” deal that saw Peugeot Citroen sell equity stakes to China’s Dongfeng Motors and the French government without contravening European Union rules on state aid for companies.

In China, precisely because its lofty industrial policy ambitions remain unfulfilled, other developing countries have an influential, if sometimes bashful, ally pursuing an East Asian state-led developmental strategy that was assumed to be obsolete and irrelevant in the Washington Consensus era of globalization. Even in a so-called post-Washington Consensus era, with the rules of the global trading system showing no signs of rebalancing in favour of developing country interests, these kinds of kindred “fellow traveller” development partners are hard to come by. Far from relying on the kindness of strangers, though, maximizing dynamic South-South benefits will require an attitudinal change in other developing countries to shed their passive growth

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strategies to also increasingly devise their own active industrial policies tailored to their developmental stages (UNIDO 2013:148-150, Chang 2012, Rodrik 2010, UNCTAD 2007, Lall 2004). Indeed, some of these South-South dynamics appear to be already in play under the rubric of “indigenous” innovation/development.

From a two-world economy (the United States and China) global imbalances perspective, Jim O’Neill of Goldman Sachs simply argued,

“this decade is all about the US becoming a bit less like the old US and a bit more like the old China and China becoming a bit less like the old China and bit more like the old US” (Chatham House 2012:13).

Similarly, from a South-South viewpoint, can other developing countries contemplate being more like the “old China”? In lamenting the inability of Indian government institutions to cope with the demands of fast economic growth, Raghuram Rajan noted, “in addition to more investment, India needs less consumption and higher savings.”

Economists often raise the issue of the “fallacy of composition” or the adding-up problem: if all developing countries were to suddenly switch to an investment-led growth strategy that boosted production and exports, which economy would have the wherewithal in demand to absorb all of this production? Though an important consideration, it is the view of the author that this something of a red-herring issue, given that the “fallacy of composition” is a narrow construct based on an export-oriented strategy rooted in static comparative advantage, that precludes wider dynamic considerations of an evolving basket of production and export items and the policy tools needed to spur this process of diversification and industrial upgrading.

Moreover, all developing countries are unlikely to forcefully shift to investment-led growth all at the same time and to the same degree; indeed, it took Beijing policy-makers some time before the pieces of this puzzle were in place. This view stems from insights provided by Hirschman (1958), who argues that the main bottleneck holding back development was not the lack of one or even of several needed factors or elements (such as capital, education, industrial subsidies or tariff protection, good governance, rule of law) that must be combined with other elements to produce development, “but with the deficiency in the combining process itself.” As Hirschman further explained,

Our diagnosis is simply that countries fail to take advantage of their development potential because, for reasons largely related to their image of change, they find it difficult to take the decisions needed for development in the required number and at the required speed. As such, this diagnosis is less meaningful than others: it does not focus immediately on the factor which, once imported or generated within the economy in sufficient quantities, will solve the problem. Rather, the shortages in specific factors or “prerequisites” of production are interpreted as a manifestation of the basic deficiency in organization (Hirschman 1958:25) (emphasis added).

For these reasons, other developing countries that are able to gradually overcome these basic deficiencies may encounter South-South “first-mover” development benefits in actively understanding and engaging China’s dynamic development model. Such efforts, especially at China’s current stage of development, will also allow other countries selective learning opportunities from China’s experience, which could be part of a longer term objective to re-shape economic policies within a national framework more conducive to catch-up and self-sustaining growth.

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Annex

HS categories listed in stacked columns in Figure 5.

<table>
<thead>
<tr>
<th>HS-4 digit category</th>
<th>Description</th>
<th>China’s export share to OECD markets, 2012 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8483</td>
<td>Transmission shafts and cranks, Bearings housings; Gears and gearing; Flywheels and pulleys</td>
<td>65.5</td>
</tr>
<tr>
<td>8482</td>
<td>Ball or roller bearings</td>
<td>55.4</td>
</tr>
<tr>
<td>8481</td>
<td>Taps, cocks, valves and similar appliances for pipes, boiler shells, tanks, vats and the like</td>
<td>63.7</td>
</tr>
<tr>
<td>8450</td>
<td>Washing machines - household or laundry-type</td>
<td>55.9</td>
</tr>
<tr>
<td>8431</td>
<td>Parts suitable for machinery of headings HS-8425 to HS-8430</td>
<td>61.4</td>
</tr>
<tr>
<td>8430</td>
<td>Other moving, grading, levelling, excavating, extracting etc. machinery; snow ploughs/blowers</td>
<td>23.1</td>
</tr>
<tr>
<td>8429</td>
<td>Self-propelled bulldozers, scrapers, graders, levellers, shovel loaders, taping machines and the like</td>
<td>10.8</td>
</tr>
<tr>
<td>8428</td>
<td>Lifting, handling, loading or unloading machinery, not elsewhere specified</td>
<td>28.8</td>
</tr>
<tr>
<td>8427</td>
<td>Self-propelled works trucks - powered by an electric motor</td>
<td>43.7</td>
</tr>
<tr>
<td>8426</td>
<td>Derricks, cranes, mobile lifting frames and other lifting machinery</td>
<td>26.3</td>
</tr>
<tr>
<td>8421</td>
<td>Centrifuges, filtering or purifying machinery and apparatus for liquids or gases</td>
<td>48.9</td>
</tr>
<tr>
<td>8419</td>
<td>Non-domestic dryers and temperature changing apparatus; Instantaneous water heaters</td>
<td>41.2</td>
</tr>
<tr>
<td>8418</td>
<td>Refrigerators and freezers; Heat pumps other than for air conditioning</td>
<td>59.7</td>
</tr>
<tr>
<td>8415</td>
<td>Air conditioning machines (air conditioners)</td>
<td>52.2</td>
</tr>
<tr>
<td>8414</td>
<td>Air/Vacuum pumps, air/gas compressors and fans; ventilating hoods with fans</td>
<td>51.9</td>
</tr>
<tr>
<td>8413</td>
<td>Pumps for liquids; liquid elevators</td>
<td>49.0</td>
</tr>
</tbody>
</table>
SUSTAINABLE AND INCLUSIVE GROWTH IN AFRICA: 
Industrialisation a must

Humphrey Moshi
Professor of Economics
University of Dar es Salaam

Abstract
The need for Africa to industrialize, in order to address issues of unemployment, poverty and economic transformation, is back on the continent’s development agenda. This revamp is informed by the fact that the past development approaches have failed to help Africa diversify and transform its economies, generate steady and sustainable high growth rates, or deliver adequate levels of social development. Indeed, most of the policies, especially those championed by international financial institutions (IFIs), emphasized growth and downplayed the issue of structural transformation in general and industrialization in particular.

The paper aims to build a case for the imperative of boosting the manufacturing sector as the surest way of tackling Africa’s development challenges of fragile economic growth, poverty, inequality and vulnerability to socio-economic shocks.

The paper concludes with policy and strategic recommendations to guide the next generation of a manufacturing-led development paradigm by putting emphasis on the imperative of forging strong partnerships between the private and public sector.
1. INTRODUCTION

Africa’s economic performance in the last fifteen years has been characterized as “impressive” due to enhanced real GDP and per capita GDP growth. This positive growth has been due in part to the rise of emerging economies, whose demand for raw materials represents a major opportunity for resource-rich African countries. This economic dynamism was complemented by an improved environment of macroeconomic stability, implementation of structural reforms and improved governance. This positive investment climate spearheaded by reforms in the policy, legal and regulatory framework attracted foreign direct investment (FDI) into the continent.

However, the seemingly positive growth outlook has not translated into a reduction in inequality and poverty, and improved diversity of the economies, job creation, structural transformation and technological upgrading. These negative aspects of Africa’s growth performance are a clear testimony to the absence of an essential component of structural transformation in the continent’s socio-economic development strategy, namely industrialization. It has long been recognized that industrialization is one of the main engines of economic growth, especially in the early stages of development. Its essential characteristics include firstly, an increase in the proportion of the national income derived from manufacturing activities and from secondary industry in general, except perhaps for cyclical interruptions; secondly, a rising trend in the proportion of the working population engaged in manufacturing; and thirdly, an associated increase in the income per head of the population (Bagchi 1990). It needs to be emphasized that few countries have been economically successful without industrializing. Only in circumstances such as an extraordinary abundance of natural resources or land have countries been able to do so (UNIDO 2009). However, even in the latter case, it all depends on how effectively the resources are managed to avoid the resource-curse and the Dutch-disease (Moshi 2013).

The paper aims at building a case for the imperative of boosting the manufacturing sector as the surest way of tackling Africa’s development challenges of fragile economic growth, poverty, inequality and vulnerability to socio-economic shocks. Firstly, the paper analyses the critical role the manufacturing sector plays in a country’s socio-economic development. Emphasis is placed on the fact that the sector is the most dynamic one in terms of employment creation, enhancement of technological capacity and incomes. Secondly, it assesses the status of the sector in Africa by gauging its growth rate, over time, and its contribution to GDP. Thirdly, it identifies the factors which have undermined the growth of the sector. Such factors include the role played by policies merchandised by the IFIs, in the context of the neo-liberal development paradigm, with its attendant policy and financial dependence on donors, coupled with unrealistic conditions. Fourth, it draws an agenda for the revival and boosting of the manufacturing sector, while avoiding the mistakes of the past industrialization experiences. Some components of the agenda encompass an enhanced role of the state, strengthened capacity of the private sector and home-grown policies and strategies with a view to scaling up ownership of the continent’s development agenda. Finally, some policy and strategic recommendations are drawn to guide the next generation of a manufacturing led development paradigm by putting emphasis on the imperative of forging strong partnerships between the private and public sectors.

2. CONCEPTUAL FRAMEWORK

This section focuses on theoretical considerations with regard to two aspects. One is in relation to structural transformation of which industrialization is seen as a critical component of that process. The second aspect is technological upgrading and innovation, which are essential ingredients for long term productivity growth, again critical inputs and outputs of an industrialization process.

It should be noted from the outset that since 1950 all developing countries that have experienced rapid growth and catch-up have been successful industrialisers and industrial exporters (Van Ark & Timmer 2003). Countries that fell behind in aggregate terms were also the weakest industrial performers. In the past fifty years,
manufacturing has been the main engine of growth in developing countries. In other words, the structural change that involved the shifts from agriculture to industry has been a key ingredient of successful economic development (Szirmai 2008).

In the context of structural change, Lin (2012) argues that globalization provides an almost infinite potential for industrialization in many low-income countries. He contends that whereas economic growth based on exploitation of natural resources or agricultural land eventually faces the constraint of shortages of quantity, development strategy based on producing manufacturing goods for the global market benefits from economies of scale due to increasingly lower unit costs of production. This being the case, virtually any country can identify products for which it has overt or latent comparative advantage and scale it up almost without limit, thereby creating its own niche in the world market.

Notwithstanding the importance of industrialization and its role in structural transformation, mainstream development economics has paid only limited attention to this subject. This may be explained mainly by the failure of industrial policies in developing countries during the 1960s and 1970s and the theoretical argument of “state – failure” with regard to pursuing policies that tend to create unsustainable and socially costly distortions in the economy. Although this view has been challenged by those who associate the successful industrialization in East Asia with the actively pursued industrial policies, widespread scepticism about industrial policies endures (Pack & Saggi 2006).

It needs to be emphasized that establishing empirical regularities of the changing patterns of industrial structure and technological upgrading across the world is not a straightforward exercise. However, what is not contestable is the fact that industrialization has been a key feature by which successful developing economies have lifted themselves out of poverty.

A second aspect of structural transformation is technological upgrading and innovation, which are essential ingredients for long-run productivity growth. In low-income countries where budgets for research and development are scarce and industries located far from technological frontiers, technological upgrading and innovation typically take the form of adaptation and adoption of known technologies rather than the introduction of new ones (Lin op.cit.). However, effective adaptation and diffusion are dependent on absorptive capacities of firms and countries (Abramovitz 1989, Lundvall 1992). Nonetheless, observed patterns of technological adoption, education, and Research & Development strategies indicate that appropriate innovation strategies depend on endowment structure and stages of development.

Another important aspect associated with structural transformation is that of economic diversification. Not only does it protect countries from vulnerability to shocks, it also reflects the pace at which low income economies reallocate their resources to take advantage of unfolding opportunities. While high-income countries tend to exhibit substantial convergence in productivity levels across sectors, the situation is generally the opposite in low-income countries. Therefore, structural change is both a cause and consequence of sustained economic growth (Chenery 1986).

3. AFRICA’S INDUSTRIALIZATION STATUS

After fifty years of independence agriculture remains Africa’s main source of employment and livelihood with around 60 per cent of its labour force employed in the sector. However, its share in GDP is much smaller accounting for an average of 25 percent, indicating its relatively low level of productivity. The continent’s manufacturing sector is relatively small with an average contribution of only 10 per cent to GDP. However, the degree of industrialization differs significantly across countries and depends, among other factors, on the stage of development and the availability of natural resources. Countries with low per capita income levels and those with abundant resource wealth tend to have very small manufacturing sectors, often around 5 per cent of GDP or less (Africa Economic Outlook 2013).
The emerging picture of performance of the above key sectors which are supposed to be the focus and the drivers of the transformation process is that of a continent experiencing very little structural change through industrialization. In the ensuing sub-sections, the performance will be analysed in depth.

### 3.1 Trends of Structural Change

It has been alluded to in the preceding section that African economies exhibit signs of limited structural transformation. Overall GDP growth rates have been low by either Asian or BRICS standards. In 1965, agriculture value-added represented 22 per cent of Sub Saharan Africa’s GDP, services 47 per cent and industry 31 per cent (of which manufacturing contributed 17.5 per cent). In 2007, it was estimated that agricultural value-added still contributed a healthy 15 per cent of GDP while services contributed 52 per cent and industry 33 per cent (of which manufacturing accounted for 15 per cent). In terms of employment, things have not changed sufficiently. African economies were overwhelmingly rural in 1960, with agriculture accounting for 85 per cent of the labour force. While the rural share of the population has fallen steadily over the past four decades, in 2000 it was still, at 63 per cent, slightly above the 1960 average for non-Sub Saharan Africa developing countries (Lin op.cit.).

A closer look at the above trends shows that, over time, the contribution of manufacturing to GDP has been decreasing: an indication of de-industrialization. According to UNIDO (2009), Africa’s share of global manufacturing production (excluding South Africa) fell from 0.4 per cent in 1980 to 0.3 per cent in 2005 and its share of world manufactured exports fell from 0.3 per cent to 0.2 per cent. Table 1 compares selected indicators of industrial development for Africa and all developing countries in 2005. The share of manufacturing in GDP is about one-third of the average for developing countries and in contrast with developing countries as a whole, it is declining. Per capita manufactured output and exports are less than 20 and 10 per cent of developing country average, respectively. The report notes further that the region has low levels of manufactured exports in total exports and of medium technology and high technology goods in manufactured exports. Indeed, these measures have changed little since the 1990s (UNIDO 2009).

<table>
<thead>
<tr>
<th>Table 1: Selected Indicators of Industrial Development, 2005</th>
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<tbody>
<tr>
<td>Africa average</td>
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<tr>
<td>Developing countries</td>
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</table>

*Source: UNIDO and John Page (2009).*

The decline in Africa’s manufacturing base has been accompanied by a decline in diversity of the regions manufacturing sectors and a fall in sophistication of the products produced (2009). In this regard, the manufacturing sector produced a narrower range of less sophisticated products in the 1990s than in the 1980s in sixteen of the eighteen African economies for which production data existed. Page (ibid.) argues that the fall in manufacturing sophistication was especially sharp in some of the region’s early industrializers – Ghana, Kenya, Tanzania and Zambia. The trend towards narrowness and less sophistication is a clear indication of Africa’s marginalization in the world trade due to decreasing competitiveness, indicative of less presence in domestic and international markets and failure to develop industrial structures in sectors and activities with higher value addition and technological content (UNIDO 2012).
Another indicator which depicts the low level of structural change is that of intra-African exports and imports. The period 2000 and 2010 shows that trade within Africa represented about 12 per cent of the continent’s total trade in 2010, while the major part of trade (88 per cent) was with the rest of the world. During the observation period, the average level of intra-African trade, though fluctuating, has consistently remained under 15 per cent over the past decade. Again, whereas intra-African exports and imports have had an upward trend, the overall trend has been quite modest, oscillating around 10.6 per cent (2000) and 11.7 per cent in 2010 (ECA 2013).

The low levels of intra-continental trade are indicative of limited diversification of African economies, reflecting high dependence on production of primary commodities which in most cases are similar across countries. Perhaps it is important to emphasize that whenever there is an increase in intra-African trade, such an increase was triggered by trade in manufacturing. This observation points to the fact that the boosting of intra-African trade would largely be a factor of enhanced industrialization processes.

This section concludes by analyzing the position of Africa-manufactured exports in relation to the world’s merchandise exports. In reference to Table 2, one observes that in 1983 less than 10 per cent of exports from Sub Saharan Africa (excluding South Africa) were manufactured goods. Since 2000, the figure has remained below 10 per cent, falling to 7.8 per cent in 2003. This level was lower than was the case in 1965 when manufactured exports were around 8.0 per cent of total exports (World Bank 1989). Even the 9.5 per cent figure in 2005 exaggerates the participation of Sub Saharan Africa in manufactured exports. If Mauritius and Botswana are excluded, the figure drops to a mere 5.9 per cent.

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</thead>
<tbody>
<tr>
<td>Merch Exports</td>
<td>52715</td>
<td>45738</td>
<td>46469</td>
<td>65606</td>
<td>62902</td>
<td>65462</td>
<td>82833</td>
<td>97837</td>
<td>137869</td>
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<tr>
<td>Manuf. Exports</td>
<td>3899</td>
<td>5358</td>
<td>6318</td>
<td>5380</td>
<td>5223</td>
<td>6522</td>
<td>8696</td>
<td>13129</td>
<td></td>
</tr>
<tr>
<td>Percent</td>
<td>8.5</td>
<td>11.5</td>
<td>9.6</td>
<td>8.6</td>
<td>8.0</td>
<td>7.8</td>
<td>8.9</td>
<td>9.5</td>
<td></td>
</tr>
<tr>
<td>World Merch Exports</td>
<td>1,997,905</td>
<td>3,475,109</td>
<td>5,503,777</td>
<td>6,446,307</td>
<td>6,185,332</td>
<td>6,480,740</td>
<td>7,545,646</td>
<td>9,202,77</td>
<td>10,433,970</td>
</tr>
<tr>
<td>SSA/World</td>
<td>2.6</td>
<td>1.3</td>
<td>0.8</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.1</td>
<td>1.1</td>
<td>1.3</td>
</tr>
</tbody>
</table>

Source: Ajakaiye and Stein 2007

This low level of exports shows how marginalized African trade has become while other regions moved to less resource-intensive production with heavier emphasis on information technology (IT) and intellectual capital. Furthermore, the rapid increase of manufactured exports by East Asian and Pacific countries have further eroded the share of SSA to the world trade (Ajakaiye and Stein 2007).

### 3.2 The State of Technological Development

To the extent that there are strong linkages between manufacturing and technological development, this section discusses the state of technological content in the manufacturing activity. Studies show that Sub Saharan Africa is lagging not just in terms of volume but also in terms of technological content in its manufacturing. It is claimed that in certain largely traditional activities, it is possible to remain competitive with unskilled cheap labour and by processing natural resources. However, this base is eroding steadily. In almost all industrial activities, competitiveness involves technological changes, new organizational methods, flexible responses, greater networking and closely integrated production systems across firms and regions. This new competition requires better technological capability in every country, regardless of resource base and location, even in countries that are not at the frontier of innovation (UNCTAD 2003).
According to Lall and Wangwe (1998), African manufacturing does not show many signs of such upgrading. Its structure remains dominated by low-level processing of national resources and the manufacture of simple consumer goods aimed at the domestic market. There are few supply linkages between large and small enterprises. Productivity growth is poor. Capacity utilization has fallen below its peak of many years ago; a significant part of the recent growth comes from utilizing capacity, rather than building new capacity. Technological efficiency is relatively low, with little sign of technological dynamism or innovation. This state of affairs is shared by other studies (Biggs, Shah & Srivasatava 1995) by insisting that African firms are well below international “best-practice” technical levels and below levels reached by other developing countries.

The above cited studies clearly indicate that Sub Saharan Africa has the lowest share for high technology, and the highest for resource-based manufacturing. This being the case, Africa has yet to break away from the tradition of exporting unprocessed materials, which is not only the slowest-growing segment of world trade, but also the least stimulating in terms of structural entrepreneurial, skills and technology growth. Given that the structure of Africa’s production is underpinned by low levels of technological development, one can with confidence claim that the continent’s technological gap, and the attendant low industrialization, has greatly inhibited the structural transformation process.

The technological gap in Africa is not only characterized by a low tertiary-level enrolment in technical subjects but also low levels of expenditure in research and development (R & D). For example, whereas Africa has a total of about 70,000 engineers, South Korea has a corresponding figure of 577,000, the world highest proportion of population enrolled in engineering and other technical subjects. Furthermore, whereas the industrialized market economies spend about 2 per cent of their GNP on R&D, Africa’s share is around 0.3 per cent of GNP (UNCTAD op.cit.).

To the extent that the picture of Africa’s technological development is gloomy, characterized by a weak skills base, poorly developed research and innovation infrastructure, and little mastery of simple technologies, one could conclude that the cutting edge of industrial dynamism and competitiveness is conspicuously missing in Africa’s socio-development processes.

4. FACTORS UNDERMINING AFRICA’S INDUSTRIALIZATION

There are a number of factors which have been identified, by a number of studies that have contributed to the poor performance of the industrial sector in the continent. Such factors range from political and ethnic conflicts, natural disasters, external market shocks, debt and poor macroeconomic management, to inadequate infrastructure. Others are due to poor economic condition, disillusionment with past strategies, rent-seeking, political interference and limited managerial and technological capabilities (UNCTAD op.cit).

Although these factors, in one way or another, did impact negatively on the development of the sector, it is the view of the authors that the adopted development paradigm, during the structural adjust programme (SAPs) and beyond, was the major stumbling block. This is because the adopted paradigm had inherently misconceived assumptions on inclusive and sustainable development. The ensuing sub-sections will elaborate on these assumptions.

4.1.1 Neo-Liberalism Paradigm

The rise of neo-liberalism in Africa was closely associated with the fiscal and debt stock crises which governments, both in developed and developing countries, were facing in the 1980s. This development triggered the emergence of a new paradigm which emphasized the virtues of a small government; laissez-faire policies and international openness. The main drivers of this paradigm change were basically two: Firstly, conceptual developments that advocated for minimal role of the state; and secondly, the emergence of
political leadership in countries like the United States, the United Kingdom and Germany (President Reagan, Prime Minister Thatcher and Chancellor Helmut Kohl respectively) who championed the adoption of the idea of minimalist state intervention in the economy.

It is in the context of the evolution of global development paradigms, coupled with the socio-economic crisis of the early 1980s, that Africa had to embrace policy reforms in a neo-liberal direction. These reforms, in turn, were spearheaded by the World Bank and the IMF. These actors, through their financial and institutional resources, have since then been able to establish hegemony in knowledge production and dissemination and thereby attempt to establish hegemony in global and regional policy-making. The actors, coupled with many research organizations, think tanks and academic institutions, tend to operate as a giant “knowledge monopoly”; edging out competition from alternative perspectives, analysis or ideas (Guttal 2007). This “monopoly” notwithstanding, there is an influential body of literature emerging which implicitly or explicitly dismisses development as a process towards an idealized Western Model. Indeed, China’s growth record over the last 30 years and that of other East and South Asian countries are manifestations of existence of alternative development models different from those championed by the seeming monopolizers of knowledge (Moshi 2009)

The adoption of neo-liberalism in Africa and the subsequent active role of multilateral institutions through policy and finances led to loss of policy space, necessary for charting out a development path which is consistent with the demands of a sustainable and inclusive development model. This loss of policy or constrained space was achieved through two main channels: First, the lack of feasible alternatives (including sources of finance) that have led much African government to accepting a “forced consensus”, especially on macroeconomic policies; and second, the gradual conversion of many African technocrats and leaders to the ideology of the Washington Consensus (WC) and Augmented Washington Consensus (AWC) both in rhetoric and action (Shafaeddin 2006).

4.1.2 The Role of the State

The neo-liberal model advocates for a minimalist state. This stance was informed by the hypothesis that government failure was worse than market failure, thus challenging the original justification for the expansion of government beyond its night watchman role and into the role of development entrepreneur. Based on the Research Department of the World Bank, this doctrine animated a policy programme of minimizing the role of the state in development and “getting prices right”. No longer was it a matter of governments selecting their industrial investments with the correct shadow prices. Governments were now adjured to divest themselves of state industries and to liberalize comprehensively in goods markets, labour markets, financial markets, capital markets and foreign trade markets. This view became codified in what was called the Washington Consensus (Toye 2003).

This doctrine seems to be misleading over the role of state in any economy. The historical development of countries indicates that governments have played a critical role in reducing poverty and accelerating growth through policy-making, investing and showing the way (pace maker). Indeed, evidence from the East Asian countries, which have been able to attain sustainable and inclusive development shows that governments and businesses coordinate to secure high investment, high savings and re-investment and rapid growth of competitive exports in a joint strategy of national growth (ibid.cit).

According to Chang (2009), the dominant neo-liberal view on the role of the state in economic development suffers from a host of problems. Firstly, it is based on a very biased reading of the history of capitalism and globalization. Secondly, it portrays tension between its two key components – neo-classical economists and liberastarian-Austrian political philosophy. Thirdly, it fails to acknowledge that the interventionist period of the third quarter of the twentieth century was not a period of stagnation and inefficiency, as claimed by neoliberals, but saw the world economy performing better than during the liberal regimes that preceded and followed it.
For over two decades Africa’s policy makers and politicians had to embrace the narrow view of the role of state, despite its misconceptions and omissions, with its attendant negative impacts on the continent. It is only recently that Africa’s policy makers have started to build a case for “the need for a development state”. In this context, the primary goal of the African developmental state has been identified as “to overcome the continent’s inherent development challenges focusing on high and sustainable economic growth rates through diversification and transformation” (ECA 2011). The revisiting of the role of the state in the current development paradigm, although long overdue, is a commendable move. However, there is some doubt as to its implementation, given the continued dependence on the multilateral institutions.

4.1.3 Addiction to Growth

The policies and the programmes adopted so far have placed much emphasis on growth while downplaying other critical indicators of development. The over-emphasis on growth was meant to show that the reforms have been working and therefore whoever was championing the reforms did “a good job”. It is an undeniable fact that Africa has experienced growth acceleration in the 1990s and beyond. However, the growth acceleration does not deserve what others have branded as “impressive growth”. This is because on deeper examination, the performance of record of African economies has been profoundly unsettling. First, non-African growth consistently outpaced African growth after 1960, with the result that Sub Saharan real incomes fell by over 35 per cent relative to incomes in other developing regions and by nearly half relative to industrial countries. Secondly, human development gaps widened rather than narrowed over time and Africa’s cumulative progress was insufficient by 2000, to reach the levels of human development the rest of the developing world had already attained in 1960. Thirdly, at the turn of the Millennium, nearly half of the Sub Saharan African population was below an income poverty line of USD 1.5 per day, up from 35 per cent in 1970 (Ndulu & O’Connell, op.cit.).

The abovementioned indicators, in conjunction with the so-called “impressive growth”, are, in most cases, downplayed when reporting on Africa’s socio-economic performance. This is to argue that issues critical to Africa’s long-term development have not been afforded the right emphasis because of the narrowness and short-term horizon of the neo-liberalism models. Indeed, the undue emphasis placed on growth (what is termed addiction to growth) has delayed actions that would have tackled those issues that are critical for sustainable and inclusive development. These range from issues of inequality, structural transformation, agricultural and industrial development, and scaling down vulnerability.

The key message here is that growth which does not bring about a structural change is unlikely to be sustainable. Likewise, growth which does not narrow the inequalities across countries, regions, urban and rural areas, cannot be inclusive. This section concludes by making two remarks. Firstly, although growth is necessary for poverty reduction, it is not a sufficient condition for inclusive growth. Secondly, the assumption that the effects of policies on economic growth are independent of a country’s structural as well as institutional features is untenable.

4.1.4 Industrial Policy Debate

In line with the minimalist state doctrine, neo-liberals are opposed to state intervention in support of industrial transformation with the argument that state measures are likely to worsen rather than improve the operation of markets. According to Ajakaiye et.al. (2007), the strong anti-industrial policy sentiment which has been embedded in the strategies of the World Bank since the early 1980s has had the greatest influence in Africa over the past 25 years. The rationale was clearly laid out in the watershed World Development Report of 1983. The report lays out a series of reasons for rejecting state support for industry. The World Bank continued with this rejection over the 1980s and 1990s, even after it had conducted a study to investigate the role of industrial policy in East Asian “miracle” countries. In that study, it was found that the instrument of industrial policy was broadly used by the countries in question.
By the late 1990s, with the growing literature on impediments to industrialization due to market failures (Chang 1996) the Bank began to admit that there might be a rationale for industrial policy intervention. Nonetheless, the Bank continued to show its dislike for the instrument and therefore Africa had to live with it. Market-driven reforms, which have been undertaken in Africa and have committed countries to free trade, and prohibiting industry related policies continue to be undermined by their own theoretical foundations. Many of the underlying assumptions about market failure which motivated the industrial policies of the 1960s and were subsequently dismissed as irrelevant in the 1980s, have made an astounding comeback in development economic theory. In addition, new approaches to technical change and innovation have generated extensive literature documenting how market forces will not produce optimal results and that some kind of state intervention is necessary to promote industrialization (Shapiro 2007). It is therefore argued that, “a program that encourages industrialization can substantially boost income and welfare” (ibid 54).

Resistance by the neo-liberals to industrial policy is neither tenable in economic development history nor informed by a coherent theoretical framework. The long-run histories of the now developed countries and the newly developed countries clearly show that an accelerated rate of structural change is one of the key features of modern economic development (Kuznets 1966, Chenery 1979). Therefore, the rise in the share of manufacturing in GDP is one of the most firmly established historical patterns together with an even more steeply declining share of primary production.

Furthermore, experience from East and South Asian countries shows that the structure of the economy changed rapidly towards a strong specialization in non-agriculture in recent decades. The evolving sectoral patterns of growth did matter, significantly, for inclusive growth and poverty reduction (Palanivel & Gul, Unal op.cit.).

These experiences are supportive of the fact that industrial policy is an indispensable process of strategic collaboration between the private and public sectors, where the objectives are to identify the constraining factors and the challenges and to design a set of policies to address them. In other words, industrial policy is a stimulant for mobilization of investment and promotion of entrepreneurship (Rodrik 2007).

It is widely acknowledged that Sub Saharan countries display high agricultural shares in GDP and employment averaging 34 and 64 per cent respectively (World Bank 2008). Further, the large share of agriculture in these countries suggests that strong growth in the sector is critical for fostering overall economic growth. Furthermore, agriculture contributes to shaping the environmental sustainability of the growth process, across the development spectrum. This is because it is a major user of scarce resources (water and land) and a provider of environmental services (sequestering carbon, managing watersheds and reducing deforestation.

Despite the sector’s central role in unleashing sustainable and inclusive growth, agricultural and rural sectors have suffered from neglect and underinvestment over the past 25 years, a period which falls well within the implementation of the neo-liberal model. The neglect is not only by governments but also by donors. In this regard, public spending for farming has been fluctuating around 4 per cent of total government spending. The under-funding of agriculture has resulted in unsatisfactory performance of the sector in Africa, especially when contrasted with the green revolution in Asian economies. Whereas in the mid-1980s creak yields were comparably low and poverty was comparably high, fifteen years later yields in South Asia had increased by more than 50 per cent and poverty had declined by 30 per cent. On the contrary, yields and poverty in Sub Saharan Africa remained unchanged and food insecurity increased (World Bank ibid).

Indeed, “poverty reduction” was not part of the Washington Consensus. However, the doctrine held that a small state would be good for growth and growth would be good for poverty reduction. Also because poverty is more severe in rural areas and state intervention, regulations and organizations disadvantage agriculturalists and benefit industrialists, a minimalist state would tend to reduce the inequality of distribution of income and wealth. The manifesto of the counter-revolution in development was not simply about greater efficiency but also a promoter of poverty reduction through growth and equity (Toye op.cit.).
Based on the doctrine, what is seen in Africa today is low productivity in agriculture, a widening gap between urban and rural areas, and environmental degradation. This is a manifestation of the fact that the economic growth which the continent was experiencing in the 1990s and 2000s has been exclusive and not inclusive. The main argument here is that the pattern of growth was biased to the extent that it was not poverty reducing. Therefore, if what matters is the pattern of growth for poverty reduction, then the sectoral growth rate in which the poor are employed becomes more important than the overall growth rate (Revallion 2004). This suggests that a dynamic rural sector based on improved agricultural productivity could have promoted faster rural poverty reduction and thereby inclusive growth.

Christiaensen, Demary and Kuhl (2010) show that growth in the agricultural sector is up to 3.2 times more effective in reducing one-dollar-a-day poverty when compared to growth in non-agriculture. This is not surprising given that agriculture utilizes poor people’s key assets, namely land and labour, and creates economic opportunities in rural areas where the majority of the poor live. The apparent attention currently being devoted to agriculture development by the international community has been propelled by the global food crisis rather than geared towards structural transformation and productivity enhancement in Africa. Experience shows that unless a crisis has attained a global dimension it hardly gets the attention of the international community (Moshi 2012).

4.2 The Neglect of Agriculture

The literature on development economics underscores the importance of industrialization in a country’s development. Industrialization is considered an essential component of structural transformation. Therefore, it has long been recognized as one of the main engines of economic growth, especially in the early phase of development. According to Lin (2012) its essential characteristics include: (i) an increase in the proportion of the national income derived from manufacturing activities and from secondary industry in general, except for cyclical interruptions; (ii) a rising trend in the proportion of working population engaged in manufacturing; and (iii) an associated increased in the income per capita of the population. UNIDO (2009) points out that only a few countries have been economically successful without industrializing.

Despite its importance, mainstream development economics has paid only limited attention to industrialization and its role in structural transformation in recent decades. This may be explained primarily by the failure of industrial policies in some developing countries, and the neo-liberal argument that the state cannot do better than the private sector in identifying the new industries. The scepticism about industrial policies, notwithstanding, industrialization has been a key feature of successful Asian economies, lifting themselves out of poverty. On the contrary and engulfed in the scepticism, Africa remains one of the most “de-industrialized” continent in the world.

The logic underpinned by neo-liberalism suggests that import liberalization, devaluation, the reduction of protectionism and positive real interest rates will punish inefficient industries and reward the efficient ones, which are export-oriented, more labour-intensive and use more local materials, allowing the country to exploit its comparative advantage. The result will be a prosperous and growing sector, which will greatly contribute to an increase in exports while using fewer imports. Embracing this logic has seen Africa’s marginalization in the context of globalization increasing and delayed the diversification of its economies.

The slow growth of the sector has resulted not only in poor linkages with agriculture, low technological capabilities, but also poor provision of employment opportunities especially for skilled labour. Therefore, the fact that the manufacturing sector failed to play its rightful role in the African economies meant that the ultimate goal of sustainable and inclusive growth was not achieved.
5. INDUSTRIALIZATION: AN IMPERATIVE

Having analyzed the status of industrialization in Africa, as well as the factors inhibiting its effective adoption and implementation, a case must now be made for why industrialization and technological upgrading are an imperative if the continent were to attain higher rates of growth which are both inclusive and sustainable. Two arguments to support the imperative for industrialization are presented: firstly, there is broad consensus that no country or region in the world has achieved prosperity and a decent socio-economic life for its citizens without the development of a robust industrial sector; and secondly, there exists abundant potential in terms of resources to trigger support for the process of meaningful industrialization in Africa.

5.1 Centrality of Industrialization

Africa’s continued marginalization from industrial production and trade can only be effectively reversed by fostering industrialization, a key driver of structural change. This realization should be a catalyst for the continent’s policymakers and politicians. Experience elsewhere shows that the current growth being experienced in Africa cannot be sustained without a structural transformation that lifts workers from low-productivity agriculture and the informal sector to higher productivity activities. This transformation is yet to take place in Sub Saharan Africa. The booming price of commodities (oil, cotton, metals) that the continent mostly exports has fuelled a large part of the past decades’ growth. This notwithstanding, investments remain low in Africa – less than 15 per cent of GDP, compared with 25 per cent in Asia, and more than 80 per cent of workers are stranded in low productivity jobs (Dinh et.al 2012).

Experience also shows that labour-intensive light manufacturing led the economic transformation of many of the most successful developing countries. It needs to be recalled that high employment-intensity growth and rise in productive activities are important ingredients for poverty reduction and inclusive growth. Indeed, given the high levels of youth unemployment, Africa cannot avoid industrializing. It is documented that the burden of unemployment is falling disproportionately on the youth. With more than two-thirds of its population under 25 years SSA is youngest region of the world. The youth bulge is increasing at an alarming rate. By 2045, 50 per cent of the population will be between 15 and 24 years old, adding another 173 million young people to the labour force. Across Sub Saharan Africa youth unemployment already stands at 35 per cent. Therefore, creating jobs at a rate fast enough to keep pace with population growth is an enormous challenge but an unavoidable undertaking (AfDB 2012).

5.2 The Potential is Enormous

The potential for industrialization in Africa can be conceptualized from two perspectives. The first is the conducive environment in which Africa finds itself currently and the prospects for the future. Indeed, most publications portray Africa positively in terms of macro-economic stability, investment climate and democratic governance. There are areas of significant deficit in physical transport infrastructure, energy, and corruption, but the outlook also appears positive, with many parts of the region forecast to continue experiencing relatively high growth rates and a number of African economies predicted to remain among the fastest growing in the foreseeable future (Ernst & Young 2013).

The second is Africa’s comparative advantage in terms of low cost of labour and in natural resources. Indeed, given Africa’s comparatively low skill-to-labour ratio it needs low-skilled jobs to make this happen. Manufacturing rather than services provides the basis for low-skilled jobs. Furthermore, the continent has a strong comparative advantage in natural resources, in the form of energy, minerals or agriculture. These can be drivers of structural transformation through linkages, employment, revenue and foreign investment, provided adequate business environment and supporting policies are in place. It needs to be underscored that there is no inherent trade-off between commodity-based and labour-intensive industries: countries with natural-resource sectors also exhibit diversified manufacturing (UNDP, et.al 2013).
Africa’s enormous natural wealth is perceived to hold great potential for accelerating structural transformation and making growth more inclusive through the channels of putting in place the requisite infrastructure, strengthening skills, enhancing agricultural productivity, optimizing revenue from natural resources and forging strong linkages to and from the extractive industries. The effective performance of these channels will ultimately usher in a natural resource-led industrialization path.

5.3 Getting Down to Business

In this section the kind of thing which needs to be done in order for Africa to industrialize is discussed. That is, the “how” to do it. The perspective is that successful industrialization in the continent can only be achieved by ensuring that firstly, the development paradigm is right, and secondly, ensuring that a conducive investment climate is in place.

5.3.1 An Appropriate Development paradigm

Neo-liberalism as a development paradigm is not inherently inappropriate for Africa’s socio-economic development. Experience shows that its application elsewhere, including the Asia countries, the United States and Europe propelled growth and development and subsequently led to agricultural productivity, industrialization, employment creation and poverty reduction. However, what distinguishes its adoption in Africa from other countries is the condition of dependence underpinning its application. Under conditions of dependence adaptation becomes difficult, if not impossible. Likewise, ownership of the development agenda by a country’s leadership is strained. Furthermore, long-term development objectives of a country are subordinated to short-term objectives of growth, guided by a regional and global development agenda (MDGs poverty reduction initiatives, social protection).

As alluded to earlier, dependence policy conditionalities and the underlining assumptions, in most cases, had adverse effects on developing countries, including those in Sub Saharan Africa. According to UNCTAD, “big bang liberalization” contributed to developing countries (excluding China) increasing their trade deficit by 3 percentage points of GDP between the 1970s and 1990s, while the average economic growth rate was lower by 2 percentage points. Trade liberalization sharply increased their import propensity but exports failed to keep pace.

Several studies have shown that premature trade liberalization during the 1980s and early 1990s was accompanied by the de-industrialization of most developing countries (Shafaeddin 1995 and 1996). Africa suffered even more given the early stages of its industrialization process. Indeed, as trade liberalization intensified, de-industrialization also intensified.

The prominent and minimalist role assigned to markets and state respectively was wrongly conceptualized. Both theory and empirics underscore the fact that the market alone is not the only tool of coordination of economic activities. There are roles for the market and the government. Their relative importance tends to change in the course of industrialization and development. At early stages of development there is public guidance over markets and for this the capacity of the government machinery for formulation and implementation of policies needs to be strengthened (South Centre 2010).

The road map towards appropriate development demands, first and foremost, requires that Africa has to reduce its policy and financial dependence on international financial institutions (IFIs). The re-gaining of the lost policy space, under dependence, is fundamental for countries’ independence and flexibility in designing their economic, financial and social policies and institutions, aligned to their circumstances. This measure has to be complemented by having credible leadership, which is visionary and development-oriented. In the context of this framework, the expected role of the state would be enhanced but in order to perform its envisioned role effectively, it has to undergo a major transformation with the ultimate objective of nurturing and sustaining a technocratic bureaucracy that effectively plans and delivers the expected results and outcomes (Moshi
The belated recognition, by African policymakers, of the need for a “developmental state” and for “the time is now” for Africa’s industrialization has to be matched with concrete actions of reducing dependence and building state capabilities. Unless this is done, even the adopted “Action Plan for Accelerated Industrial Development of Africa (AIDA)” will hardly be implementable.

5.3.2 Conducive Investment Climate

Informed and dictated by the appropriate development paradigm, a friendly investment climate has to be created. The creation of such an environment is both a state as well as a private-sector role. A number of studies, especially from the international donor community, tend to claim that Africa’s poor industrial performance is due to the deficiencies in the investment climate and not those inherent in the current development paradigm. For example, a development paradigm which is grounded on a minimalist state role assumes that the role of building infrastructure, skills development and spearheading regional integration should be undertaken by the private sector. However, the realities on the ground dictate that such a situation is not tenable.

In reality, however, and learning from experiences elsewhere, government’s active role is indispensable in putting in place both hard and soft infrastructure, either alone or in partnership with the private sector. Without an active role for government in these key areas, Africa will continue to lag behind other regions in terms of the infrastructure gap which is already relatively large. It is at least 20 percentage points behind the average for low-income countries on almost all major infrastructure measures. Likewise, a lack of skills has been identified as one of the factors that constrain unlocking Africa’s industrial potential (Page 2012).

In ensuring that the investment climate is right for effective mobilization of both domestic and foreign investment a comprehensive approach needs to be taken on board by focusing on the industry system in totality. Usually, such a system comprises three major components, namely intermediary institutions (industry associations, training institutions, technology support, R&D institutes, financial institutions); factor markets (natural resources, labour and skills, finance input supplies, infrastructure); business environment (macroeconomic policies, industrial trade regimes, regulatory and legal framework). In all these components, the need for coordination, consultation and collaboration between the private and the public sector is implicitly conspicuous.

In addition, the investment climate improvement efforts should contain incentives that encourage firms to compete by exporting. There is solid evidence that firms that export are those with higher productivity levels (Söderbom & Teal 2003). This being the case, it is important for countries to embrace an export push strategy through which firms will learn how to compete. Further efforts should also focus towards supporting industrial clusters in the form of export processing zones (EPZs) and the like. However, in order for these instruments to be effective, in attracting a critical mass of firms, they must have the requisite enablers in terms of physical, human and institutional capital. Indeed, if the EPZs are adequately facilitated they can become centres for outsourcing arrangements between local and foreign firms.

In the recent past, the improvement in investment climate has attracted a lot of FDI projects into Africa, mostly in the extractive activities, services and to some extent in the manufacturing sector. The challenge remains in shifting this investment destination towards manufacturing, and ensuring that the extractive activities create strong backward and forward linkages to the rest of the economy as a way of promoting manufacturing.

The other challenge is ensuring that the mobilization of foreign investment does not lead to offering over-generous concessions to such investors, like granting of tax holidays and other monetary incentives. Such concessions are counterproductive as they contradict the objective of scaling up domestic resource mobilization as a way of reducing dependence. In actual fact, recent studies show that in spite of the improved investment climate, capital flight from 39 African countries over the period 1970-2010 amounted to $1.3 trillion in real terms and up to $1.7 trillion including accumulated interest (Ndikumana et.al. 2012). Indeed, it is ironic that poor African countries that are struggling to mobilize resources have vast financial resources that they cannot access as they are hidden abroad.
6. CONCLUDING REMARKS

In this paper we have raised both theoretical and empirical arguments to indicate why Africa must industrialize, not only as a way of spearheading structural transformation, but also as the surest strategy for attaining inclusive and sustainable growth. In other words, whereas neo-liberalism managed to revamp GDP growth in a number of African countries in the 1990s, the 2000s and beyond, the quality growth was not consistent with the long-term objectives of structural change, inclusive development, job creation and proactive role in the globalization process.

These inconsistencies were a product of policies adopted by most African countries which were merchandized by the World Bank and International Monetary Fund. The policies were neither informed by Africa’s quest for structural transformation nor aimed at reducing Africa’s marginalization in the globalized world. In fact the policies were based on wrong assumptions on the role of state and industrial policy. This mismatch led not only to poor performance of the agriculture sector but also that of the industrial sector. Ultimately, the objectives of employment creation, enhancement of incomes and productivity, narrowing of technological gap, and reduction of inequalities were not attained.

To the extent that the African leadership is at least more aware now than in the past of the critical role industrialization plays in a country’s socio-economic process, as a driver of structural change, enhancement of technological capabilities and creator of decent jobs, the demand for industrialization has become louder. It is in this context that the time is ripe for embarking on a serious industrialization drive. However, the starting point is for Africa to own the development process by first and foremost adopting a non-dependence development paradigm, given that the less dependent a country or region is, the better positioned it will be to resist policy imposition. Therefore, such a paradigm should then inform and underpin policies, strategies and incentive structures (investment climate) for structural transformation, while appropriately defining the key roles to be played by both the public and the private sector in the process of industrialization.
References

Manufacturing Led Growth for Employment and Equality