Making Manufacturing *Work*:

An Investigation of Employment Outcomes in South African Manufacturing

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Submitted to the University of Cape Town in partial fulfillment of the requirements for the degree:

Master of Commerce Specializing in Economic Development

Faculty of Commerce

University of Cape Town

27th December 2019

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Abstract

The aim of this research paper is to investigate the employment outcomes in South African manufacturing between 1972 and 2016. The research employs a combination of qualitative and quantitative analysis in demonstrating how South Africa's manufacturing sector has become increasingly capital-intensive, with aggregate manufacturing employment falling by approximately 600 thousand jobs between 1982 – 2016. The investigation highlights the influence of industrial policy decisions in this outcome, creating a bias towards investment in capital-intensive manufacturing industries. This trend has continued *post*-1994, despite government's repeated commitment to job creation and strategic policy support for more labour-intensive industries.

A further investigation of the manufacturing sector at a sub-industry level indicates that while capital-intensity has increased in capital and labour-intensive industries alike, the increase in aggregate manufacturing capital-intensity is due primarily to capital-intensive industries expanding their share of aggregate capital stock and output relative to labour-intensive industries. Consequently, South Africa's revealed comparative advantage lies, somewhat paradoxically, in capital-intensive production, contrasting the manufacturing sectors in similar comparator countries.

To ensure a rigorous investigation of the aforementioned outcomes, the paper examines the common notion that South African real wages are too high to be competitive in labour-intensive production. The findings indicate that poor labour productivity is an equally important contributor to uncompetitive unit labour costs relative to competitor countries.

As a means of addressing these challenges, utilizing a practical example, the paper proposes the use of special economic zones to create an environment from which labour-intensive production can thrive. It highlights the potential of targeted industrial policies, in a controlled environment to reduce the cost of labour whilst simultaneously improving productivity over time. Utilizing various instruments, for example wage subsidies, the example illustrates how such an approach is a cost-effective way of encouraging investment in labour-intensive industries, simultaneously offering a solution to more meaningful employment creation in South African manufacturing.

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ABBREVIATIONS

ADB	Asian Development Bank
AEEE	Average Export Elasticity of Employment
ANC	African National Congress
ANIR	Annual National Incentives Report
BCC	Bargaining Council Compliant
CA	Comparative Advantage
CAGR	Compound Annual Growth Rate
CDE	Centre for Development and Enterprise
CI	Capital-intensive
CIDZ	Coega Industrial Development Zone
CP	Capital Productivity
DTI	Department of Trade and Industry
ELIDZ	East London Industrial Development Zone
EM	Emerging Market
FDI	Foreign direct investment
GDP	Gross Domestic Product
GEAR	Growth, Employment and Redistribution
GEIS	General Import Incentive Scheme
GVCs	Global Value Chains
ICI	Intermediate capital-intensive industry
ICOR	Incremental Capital Output Ratio
IDAD	Incentive Development and Administration Division
IDC	Industrial Development Corporation
IDZ	Industrial Development Zone
ILO	International Labour Organisation
IMF	International Monetary Fund
IPAP	Industrial Policy Action Plan
IPR	Import Penetration Ratio

ISI	Import Substituting Industrialization
ITC	International Trade Center
K/L	Capital-Labour Ratio
LI	Labour-intensive
LP	Labour Productivity
MEC	Mineral-Energy-Complex
MIDP	Motor Industry Development Programme
NIPF	National Industrial Policy Framework
PBO	Parliamentary Budget Office
PMG	Parliamentary Monitoring Group
QLFS	Quarterly Labour Force Survey
QR	Quantitative Restrictions
RCA	Revealed Comparative Advantage
SEZ	Special Economic Zone
SEZAB	Special Economic Zone Advisory Board
SITC	Standard International Trade Classification
TFP	Total Factor Productivity
UCC	User cost of capital
UCI	Ultra capital-intensive industry
ULI	Ultra labour-intensive
UNIDO	United Nations Industrial Development Organization
WTO	World Trade Organization

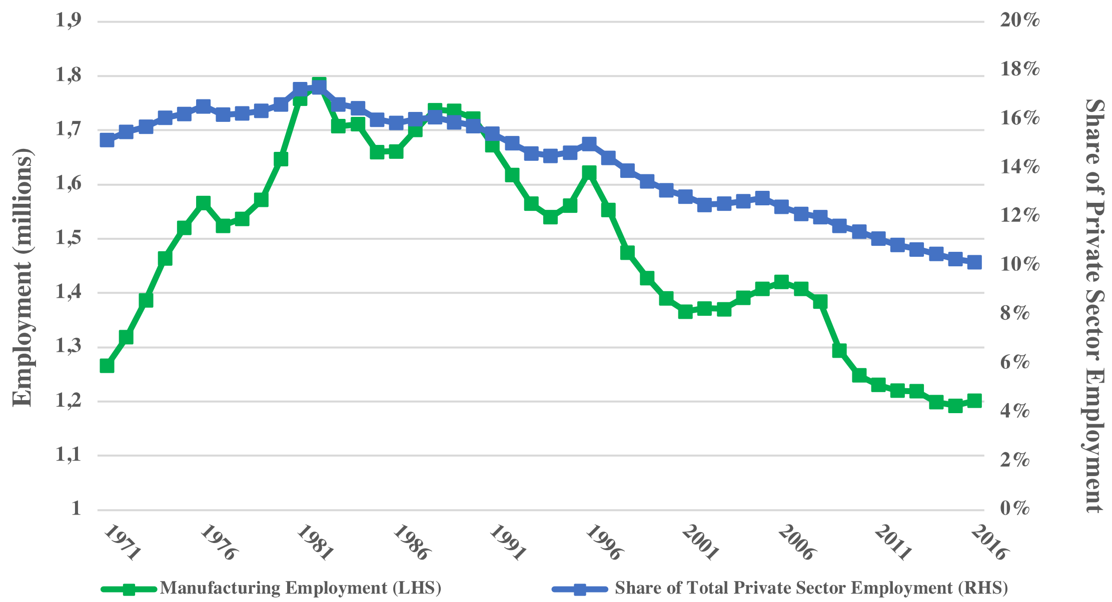
INTRODUCTION

High unemployment in South Africa remains a fundamental obstacle to economic transformation, poverty reduction and inclusive economic growth (Pollin, Epstein, Heintz, Ndikumana. [Pollin et al.] 2006.1-2). Over the past decade, unemployment in South Africa has risen reaching just under 28% by the end of 2018 (Quarterly Labour Force Survey [QLFS], 2019). With 6.2 million people unemployed in South Africa at the start of 2019, as well as three consecutive years of negative per capita GDP growth, it's clear that the country's development trajectory must change to encompass more labour absorbing growth to combat the burden of high unemployment (The World Bank, 2017:53).

In this regard, numerous development success stories talk to the job creation potential that a dynamic industrial base can generate, none more so than in East-Asia and in particular China (Asian Development Bank (ADB), 2018). A robust manufacturing sector has long been recognized for its capacity to absorb surplus, often low and semi-skilled labour in an economy, concomitantly catalyzing growth and socio-economic development (The World Bank, 2017:48-50). South Africa however, presents a different picture, one in which growth in the manufacturing sector has failed to translate into the transformational employment outcomes experienced in other developing economies.

Figure 1.1 indicates that manufacturing's contribution to formal private sector employment fell from roughly 17% in 1982 to little over 10% by 2016. In absolute terms, net formal manufacturing employment has declined significantly since at least 1981, falling from 1.79 million to little over 1.2 million by 2016. In stark contrast, the manufacturing sectors in China, Turkey, Vietnam, Mexico and Thailand contributed 22%, 18%, 17%, 17% and 16%

Figure 1.1: SA Manufacturing – Total Employment & Share of Private Sector Employment



Source: Department of Trade and Industry.
Author's own calculations

respectively to private sector employment in 2018 (International Labour Organization [ILO], 2019). Moreover, in all of the aforementioned cases, manufacturing's contribution to private sector employment was greater in 2018 than it was in 2008 (ILO, 2019). Over the same period, net employment in manufacturing grew globally by 30 million jobs, with notable manufacturing employment growth in China (5 million jobs), India (5 million jobs), Vietnam (2.5 million jobs), Mexico (2 million jobs) and Turkey (1 million jobs) (ILO, 2019).

Although the trend of stuttering economic growth in South Africa partly explains the lack of employment growth in manufacturing (Black and Hasson, 2012:3; Chinembiri, 2010:5; Raubenheimer, 2015a), this has been exacerbated in both capital and labour-intensive industries alike, where advancements in technology, capital equipment and production processes have necessarily meant that less labour is required to produce rising levels of output (Pollin et al. 2006.10, ILO, 2016:9). However, these are not phenomena unique to South Africa and yet the manufacturing sectors in other emerging market economies have nevertheless been able to achieve meaningful employment growth. It therefore stands to reason that in order to understand South Africa's negative employment outcomes relative to its peers, one must explore the unique, idiosyncratic factors that have led to this divergence.

An historic overview of industrial policy in South Africa is a logical place to start, as government policy has traditionally (*pre*-1994) supported and incentivized highly capital and energy-intensive manufacturing industries with limited job-creation potential (Black and Hasson, 2012:4). *Post*-1994, government support has remained heavily concentrated in industries that are highly-skill and capital-intensive, despite major industrial policy documents stating large-scale employment creation as the central objective (DTI, NIPF. 2007.18; DTI, IDAD. 2016:5). This bias in State support has fostered a path-dependence on capital-intensive industries for manufacturing growth, despite the most glaring economy-wide inefficiency being the current abundance of unemployed and unproductive low-skilled labour in the economy. (Black and Hasson, 2012:5).

The effects of trade policy, in particular the liberalization thereof post-1994, must also be accounted for when assessing the poor employment outcomes in South African manufacturing (Chinembiri, 2010.1-7). Many of the light manufacturing industries, that have traditionally supported employment growth, have been the hardest hit by an exposure to increased global competition from low cost producers (Black and Hasson, 2012:6). Increased exposure to foreign competition, coupled with real wage growth in South African manufacturing that's consistently outstripped growth in productivity, has contributed to a flurry of low-cost imports from foreign producers (Bhorat and Rooney, 2017:2; Edwards and Jenkins, 2015:447; Edwards and Golub, 2004:2).

The trend of increasing capital-intensity on the one hand and increased competition in labour-intensive manufacturing on the other, has resulted in a manufacturing sector that paradoxically demonstrates a comparative advantage in capital-intensive manufacturing, despite the abundance of surplus low-skilled labour in the economy. Bearing in mind the severity of South Africa's unemployment crisis, this trend must change if meaningful progress is to be made in combatting the socio-economic challenges plaguing the country at present. Thus, in order to transform the economy, industrial policy should be the fundamental stimulus to effectively utilize the endowment of low-skilled labour and discourage the overdependence on sub-optimal capital and energy-intensive production.

By utilizing a combination of qualitative and quantitative analysis, this paper seeks to examine the idiosyncratic factors that have led to the underwhelming employment outcomes in South African manufacturing. In doing so, the objective is to present a policy approach that may meaningfully combat these factors, such that South African manufacturing can better emulate the growth and employment outcomes experienced in the manufacturing sectors of other developing countries. To this end, the remainder of the paper is set out as follows:

Section 1 explores in detail the evolution of South African manufacturing by examining the employment outcomes in the sector; the industrial policies that have (and continue to) shape the investment and growth outcomes in the sector; the evidence of increasing capital-intensity in the sector; and the impact of the deindustrialization phenomenon on South Africa as well as other emerging market economies.

Section 2 examines the findings of the previous section from a sub-sectoral perspective, detailing the trends in growth, capital-intensity, employment, productivity and trade performance of various manufacturing sub-sectors in South Africa. The purpose is to establish the extent to which employment outcomes have been shaped by the expansion of capital-intensive industries relative to labour-intensive industries, as well as the extent to which changes in factor-intensity within industries has driven aggregate manufacturing employment outcomes.

Section 3 examines the impact of international competition on the composition of South Africa's manufacturing trade flows by detailing the exposure to foreign imports and dissecting the export performance of various manufacturing sub-sectors. The section then utilizes the *revealed comparative advantage* approach to compare and contrast South Africa's comparative advantage with comparator countries.

Section 4 debunks the popular notion that high wages are the sole reason for a lack of cost competitiveness in South African manufacturing. Using a sample of 21 comparator countries, this section uses various quantitative analyses to assess South African unit labour-costs, labour-productivity and average real wages relative to the selected comparator countries in selected manufacturing industries.

Finally, *Section 5,* on the basis of the findings in the preceding 4 sections, presents a practical strategic policy approach aimed at improving employment outcomes in South African manufacturing, with the use of labour-intensive special economic zones as the cornerstone of a broader policy approach aimed at generating large-scale manufacturing employment.

SECTION 1 – The Evolution of Employment Outcomes in the South African Manufacturing Sector

This section explores various aspects of South African manufacturing that have contributed to the poor employment outcomes in the sector. As a first point of reference, the section will examine how over the past four decades manufacturing employment has decreased and capital-intensity has increased. Thereafter, the section will detail the industrial policy decisions that have shaped the aforementioned outcomes, with further analyses exploring the implications for manufacturing productivity and trade.

1.1 <u>The Rise of Capital and Fall of Labour in South African Manufacturing</u>

It has long been recognized that growth in manufacturing is central to a country's development, catalyzing economic growth and absorbing surplus lower-skilled labour in the economy. However, South African manufacturing has failed to deliver these developmental benefits, most notably from the standpoint of employment. In contrast to the steady decline in net manufacturing employment in the sector, capital investment has increased significantly. *Table 1.1a and 1.1b* present data on the average annual compound growth rates of manufacturing real output; real capital stock and real capital stock per worker, as well as their respective absolute levels, between 1972 and 2016[1] [2]. As an additional point of reference, *Figure 1.2* presents these changes as an index relative to their 1972 levels and includes a series for the aggregate capital-labour ratio (K/L) as well.

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[1] All values expressed in 2010 constant prices.

[2] Peak employment in 1982.

Table 1.1a Compound Annual Growth Rates – South African Manufacturing Real Output, Employment & Capital Stock

SA Manufacturing CAGR (%)	(1972-1980)	(1981-1990)	(1991-2000)	(2001-2010)	(2011-2016)
Manufacturing Real Output	5.8%	0.8%	4.2%	2.4%	-0.02%
Manufacturing Capital Stock	8.1%	1.5%	2.0%	0.7%	-1.8%
Manufacturing Number of Employees	2.8%	-0.2%	-2.0%	-1.0%	-0.5%
Capital Stock Per Employee	5.2%	1.8%	4.1%	1.7%	-1.4%
Employees (Per R1-million Output)	-2.5%	-0.9%	-6.0%	-3.3%	-0.5%

Source: Department of Trade and Industry.
Author's own calculations

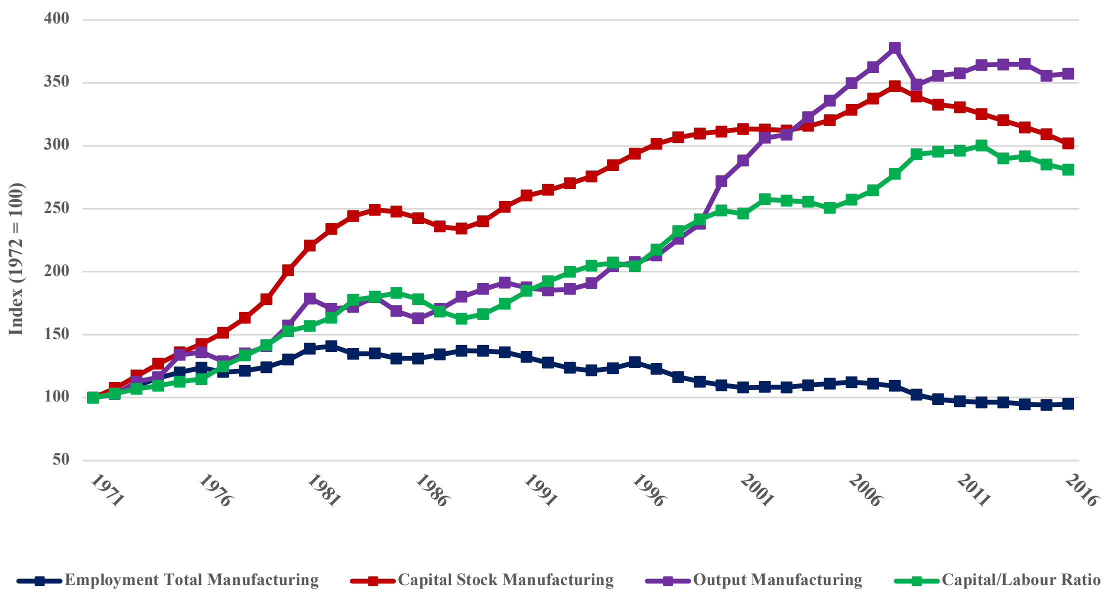
Table 1.1b Actual Levels South African Manufacturing Real Output, Capital Stock & Employment

SA Manufacturing Actual Levels	1972	1980	1990	2000	2010	2016
Real Output (2010 prices)	429 628	658 276	801 163	1 138 899	1 488 968	1 496 129
Capital Stock (2010 prices)	210 888	394 242	492 937	610 209	652 174	591 212
Employment (2010 prices)	1 318 514	1 646 815	1 722 518	1 390 485	1 248 645	1 201 467
Employees (Per R1-million Output)	3.1	2.5	2.2	1.2	0.8	0.8

Source: Department of Trade and Industry.
Author's own calculations

That South African manufacturing has been, and remains highly capital-intensive, at least in part accounts for the lack of employment growth in the sector (Black and Hasson, 2012:4; Mohamed, 1997:1-7; Levy, 1992:3). The tables reveal that large-scale increases in manufacturing capital stock occurred between 1972 and 1980, where growth in aggregate manufacturing capital stock grew at an average rate of 8.1% per annum, with employment only growing at 2.8% per annum over the same period. While the rate of growth in manufacturing capital stock slowed from 1981 to 2010, it nevertheless continued to increase, while manufacturing employment has declined over the same period. The growing divergence

Figure 1.2 Increasing Capital-intensity in South African Manufacturing



Source: Department of Trade and Industry.
Author's own calculations

between capital investment and employment is usefully illustrated by the significant growth in the aggregate K/L ratio in South African manufacturing between 1980 and 2010 (see *Figure 1.2*).

The data presented in *Tables 1.1a*, *1.1b* and *Figure 1.2* support the views expressed by Levy (1992:13) and Black, Craig and Dunne [Black *et al.*] (2017) who note that industrial policy of the time supported capital *deepening*, rather than capital *widening*. Capital *widening* implies an expansion of production capacity in response to growing demand, with little or no change in the factor composition in production. In contrast, capital *deepening* instead focuses on increasing production capacity by substituting capital for labour inputs and thus increasing the K/L ratio (Tregenna, 2007:143). Implicitly, any growth in output would consequently require fewer employees in its production, with *Table 1.1b* exemplifying this by detailing the number of employees required to produce R1million of output in 1972 and 2016 respectively. In 1972 for every R1million of manufacturing output produced, just over 3 employees were required in its production. By 2016, less than one employee (0.8) was required for every

R1million of output produced. *Table 1.1a* indicates that this downward trend has been persistent, indicating that increases in manufacturing capacity and output since at least 1981 can almost entirely be attributed to an aggregate net increase in capital stock, highlighting the structural shift toward an increasingly capital-dependent industrial growth path.

1.2 The Evolution of Industrial Policy in South Africa

The outcomes of the manufacturing sector in South Africa as described above are inextricably linked to the prevailing industrial policy of the day. It is therefore imperative that any discussion of the sector's evolution occur within this context. Furthermore, the South African economy is unique in that it is characterized by a distinct structural break in 1994, when the country emerged as a democracy after apartheid. Thus, it is critical to analyze the evolution of industrial policy in this light, given that strategies and the objectives underpinning various policy decisions differed significantly *pre*-and *post*-1994.

1.2.1 Industrial Policy in South Africa *Pre-1994*

Until the early 1970's South African manufacturing grew rapidly under protective, apartheid-era industrial and trade policy (Black *et al.*, 2017:5). The establishment of the Industrial Development Corporation (IDC) is a useful starting point when evaluating the policy decisions that underpinned this growth. Established in 1940, the function of the IDC was originally to provide broad-based support and financing to South Africa's industrial and mining sectors. However, upon the formalization of apartheid in the 1950s, the IDC's scope was redefined to promote strategic government objectives in targeted industries (Black and Hasson, 2012:2). One such objective was the expansion of large-scale, capital-intensive projects in the chemicals, energy and metals manufacturing industries. The size and scope of these projects were considered too large to be undertaken by the private sector alone, warranting significant support from the IDC and other State financing mechanisms, giving rise to state-funded mega-projects such as Foskor and Sasol (Fotoyi, Tetani, Tsedu and Wood [Fotoyi *et al.*] 2016:10; Mohamed, 1997:2-7; Black and Hasson, 2012:9).

Another notable feature of South Africa's industrial development pre-1994 was the dominance of capital and energy-intensive industries and associated interests, centered around the country's vast endowment of natural resources, most notably precious metals, iron ore and coal. This has since been referred to as the mineral-energy-complex (MEC) (Fotoyi *et al.* 2016:9; Mohamed, 1997:6; Black *et al*., 2017:21; Black and Hasson, 2012:4). Underpinning the MEC, the 1970s and early 1980s were characterized by the rapid expansion of cheap, coal-based electricity, punctuated by significant investment in the parastatal Eskom (Black and Hasson, 2012:9-10; Mohamed, 1997:4-6). This expansion in electricity capacity enabled the government to set extremely low tariffs in order to attract large-scale investment in industries that were both heavily reliant on energy, and capital and resource-intensive (Black and Hasson, 2012:9; Mohammed, 1997:6).

While significant direct and indirect State support in cheap electricity sought to encourage investment in capital and energy-intensive sectors such as mining and various immediate downstream manufacturing industries (Mohammed, 1997:5-6), these investment flows were further catalyzed by policy distortions in factor markets, designed to reduce the user cost of capital (UCC) and implicitly reducing the cost of capital relative to labour. For example, South Africa experienced low (and even negative) interest rates pre-1994, epitomised by the low-interest rate loans offered to investors by the IDC. In addition, various taxation policies further reduced the UCC by allowing capital-expenditure to be deducted from taxable income, while exemption from General Sales Taxes on capital goods; 'skewed' depreciation rules; investment allowances; payroll levies and registration fees created further distortions in capital markets (Black and Hasson, 2012:9; Fotoyi *et al.* 2016:9; Samson, Quene, van Niekerk [Samson *et al.*] 2001:7). In 1981, further to the effects of these policies, the formal recognition of non-racial trade unions led to rapid unionisation and mass strike action, which meant that the cost – and risk – of labour, relative to capital further increased (Bhorat, Naidoo and Yu, 2014:4; Samson *et al*, 2001:7-8).

Not only was policy heavily biased towards capital-intensive production, but it was inherently inward-oriented and embedded within theories of import-substituting industrialization (ISI) (Fotoyi et al, 2016.10; Edwards and Lawrence, 2006:7; Thurlow, 2006:2). Manufacturing exports accounted for a little over 9% of total manufacturing output in 1971, with negligible increases in this figure by 1988 (Levy, 1992:8). High trade barriers, most notably in the form of quantitative restrictions (QRs) and import tariffs, sought to nurture domestic industries, with growth in output primarily driven by the substitution of imports for domestically produced products (Edwards and Lawrence, 2006:3). On the one hand, this gave rise to non-traditional manufacturing industries such as motor vehicles, that were able to supply the domestic market with little or no competition from foreign producers (Fotoyi *et al.* 2016:9). On the other hand, the inward-orientated nature of the South African economy to some extent inhibited the development of various industries that were relatively labour-intensive. For example, the lack of competition from imported product substitutes meant that large upstream producers of steel and chemicals could utilize import parity pricing for key inputs in the production of various light-manufactured metal and plastic products. The net effect was increased production costs in more labour-intensive downstream industries such as the plastics industry (Black *et al*., 2017:21; Green, 2009:2).

By the early 1980s anti-export bias had waned as it became apparent that ISI-based strategies were no longer sufficient to catalyze further dynamism in the South African economy (Black and Hasson, 2012: Black *et al*., 2017:5; Edwards and Lawrence,2006:4; Levy,1992:10).

The relatively small size of the South African market meant that there were limited opportunities for further growth, while the outward-oriented development success stories unfolding in East Asia boosted the sentiment that manufactured exports could deliver the required growth impetus the economy needed (Lin and Chang, 2009:6). Moreover, the country had become increasingly dependent on gold exports as a source of foreign exchange earnings, but these were no longer sufficient to service the growing capital account deficit derived from significant State borrowing for energy mega-projects such as Sasol in the 1970s, as well as globally induced sanctions placed on South Africa in the 1980's (Mohamed, 1997:11; Edwards and Lawrence, 2006:4).

Consequently, by the mid-1980s the government began to remove import controls such as QRs, and new measures such as the *General Export Incentive Scheme* (GEIS) were introduced (DTI, 2013:190; Jonsson and Submaranian, 2001:200). However, as noted by Levy (1992:10), the economy remained relatively protected during this time, despite government's stated commitment to the removal of QRs. For example, while QRs were reduced, this reduction coincided with other import tariff increases, including the use of aggressive import reference prices with the magnitude of protection dependent on the difference between the reference price and the import price. As such the South African economy remained highly protected and interventionist up to 1994 (Levy, 1992:11-12; Edwards and Lawrence, 2006:3).

1.2.2 **Industrial Policy in South Africa *Post-1994***

When South Africa became a democracy in 1994, the manufacturing sector remained protected and relatively uncompetitive, dominated by several highly capital-intensive industries and concentrated amongst relatively few large firms (Black and Roberts, 2009:211). The World Bank argued that the South African economy was fundamentally distorted, citing a combination of low real interest rates, distortions in factor markets and a bias in State support for capital-intensive production as the primary contributors to slow growth and high unemployment in the economy (Black *et al*., 2017:5; Black and Roberts, 2009:211). Very much in line with the neo-liberal '*consensus'* emerging at the time, the World Bank prescribed broad liberalization policies, including a significant reduction in barriers to trade. In line with this prescription, the newly elected ANC-led government adopted the Growth, Employment and Redistribution (GEAR) strategy in 1996, encompassing reform in trade, monetary, fiscal and industrial policy (Mkhize, 2015:6-7; Thurlow, 2006:1). The strategy placed an emphasis on exports and international competitiveness, with the manufacturing sector identified as critical in combatting slow growth and high levels of unemployment (Edwards and Behar, 2005:1; Thurlow, 2006:1-4).

Trade liberalization was a central feature of GEAR and *post*-1994 industrial policy (DTI, 2007:10). This gave rise to the removal of the remaining QRs, the simplification of the import tariff structure and a pronounced reduction in average tariffs on manufactured goods (Black and Roberts, 2009:214; Black and Hasson, 2012:5; Black *et al.*, 2017:6; Edwards and Behar, 2005:2; Fotoyi *et al.* 2016:11; Jonsson and Subramanian, 2001: 201). As a consequence, the level of protection in the manufacturing sector reduced significantly – the average tariffs on manufactured goods declined from 35% in 1984 to 12.9% in 2000, and only 9.5% by 2006 (Black *et al.*, 2017:6; Edwards and Lawrence, 2006:43). The impact of tariff reductions on imports is clear, but the effect on exports is equally significant (Edwards and Lawrence, 2006:6). Given that firms often require imports as inputs in the production process, a tax on these imports essentially acts as a tax on exports as the cost of production in increased. Thus, the reduction in tariffs was seen as critical to the government's export-oriented strategy, as this reduction would translate into lower unit costs for domestic producers and enhanced international competitiveness (Edwards and Lawrence, 2006:7).

Several other government policies sought to complement trade liberalization, many of which were supply-side interventions concerned with improving productivity and expediting the move into higher-value added activities (Nattrass and Seekings, 2007:7), as well as promoting growth in non-traditional exports (DTI, 2007:10-11). A critical concern in this regard was the lack of diversification in South Africa's export profile, with resource and energy-intensive manufacturers still constituting the majority of total manufactured exports (Ashman and Newman, 2009:1-2; Edwards and Lawrence, 2006:7-8; Fotoyi *et al.* 2016:12). Subsequently, the Motor Industry Development Program (MIDP) was implemented in 1995 as a means of boosting growth in output and exports of motor vehicles and associated industries (Black *et al*., 2017:6; Black and Hasson, 2012:6; DTI, 2007:10-11; Edwards, Rankin, Schoer [Edwards *et al*.] 2008:5). Additionally, efforts were made to enhance the knowledge, technology and skills-intensity of production and exports (DTI, 2007:10). To this end, the government introduced the *National Research and Development Strategy*; the *Integrated Manufacturing Strategy;* and the *Advanced Manufacturing Technology Strategy* as a means of delivering on these objectives (Black *et al.*, 2017:7; Black and Hasson, 2012:5; Black and Roberts, 2009:214).

However, despite this broad array of policy interventions, the net impact remained limited (Black *et al*, 2017:8). While the interventions described above were aimed at widening the scope of State support by promoting non-traditional exports and ensuring more labour absorbing growth, the reality was that significant support remained focused in capital and energy-intensive industries (Black and Roberts, 2009:215; Black and Hasson, 2012:6). Consequently, while non-traditional exports had grown, much of this growth could be accounted for by industries with low job-creating potential such as the relatively capital-intensive motor vehicle industry (Black *et al*., 2017:7; Ashman and Newman, 2009; Fotoyi *et al.* 2016:11). Moreover, despite a commitment from the IDC to further promote labour-intensive industries, a large proportion of funding remains weighted heavily in favour of capital and energy-intensive industries (Black *et al.*, 2017:7; Black and Hasson, 2012:15-16; Black and Roberts, 2009:215).

Epitomising the outward-oriented industrial policy *post*-1994 was the implementation of the *Industrial Development Zone* (IDZ) policy framework in 1997 and later, the revised *Special Economic Zone* (SEZ) policy framework in 2014, established to encourage investment in export and employment-intensive industries (Chinguno, 2011:2). However, the IDZ program was flawed and struggled to attract the investment required to replicate the success of similar industrial zone programs in East Asia (Chinguno, 2011:2-3; Asian Development Bank; 2015:64-68). Furthermore, despite job-creation consistently cited as a central objective of South Africa's current SEZ program (DTI, 2019), there has been no clear intention shown to target investors from industries that offer the greatest job-creation potential. Consequently, investment in South Africa's SEZs has to a large extent reflected the capital-intensive investment patterns highlighted above[3] (South African Industrial Development Zone Survey [SAIDZ], 2015; East London Development Zone Survey [ELIDZ], 2015; (Black and Hasson, 2012:15).

1.3 Inefficiency of Investment in South African Manufacturing

Although capital investment in manufacturing has been significant since 1972, it hasn't been deployed with any great efficiency. Consider *Table 1.2* which details the compound annual growth rates of capital productivity (CP), labour productivity (LP) and total-factor productivity (TFP) in South African manufacturing between 1972 and 2016. Additionally, the table displays the average incremental capital output ratio (ICOR) over this period. The data reveals an

[3] Both the IDZ and SEZ policies are explored in greater detail in *Section 5* of this study.

average reduction in CP between 1972 and 2000. Between 1972 and 1980, CP fell by 2.7% per annum, falling again by 1.1% per annum between 1981 and 1990, and by 0.2% per annum between 1991 and 2000. Levy (1992:3) notes similar declines in CP between 1971 and 1988, citing annual CP declines of 2.8% per annum.

The fall in CP is indicative of inefficiencies in investment decisions, many of which were made by government under the ambitious expansion of Eskom and the previously State-owned Sasol. Nonetheless, it's clear from *Table 1.2* that investment consistently flowed to activities that were already under-utilizing their production capacity. Indicative of this, is the fact that the sector was able to significantly increase its output between 1997 and 2008 (*see Figure 1.2*), without the proportionate increased investment in factor inputs, resulting in an improvement in TFP over this period. The marginal gains in CP between 2001 and 2010 reflect as much, with CP increasing by 1.7% per annum. In contrast to CP, there have been notable gains in the LP of South African manufacturing as noted by Rankin (2016:6-7). *Table 1.2* indicates that LP changes have remained positive on average since 1972, with the average CAGR of LP consistently above zero. These gains are hardly surprising given the scale of capital investment

Table 1.2 South Africa's Compound Annual Growth Rate - Manufacturing Productivity and ICOR

	CAGR (%)				
	(1972-1980)	**(1981-1990)**	**(1991-2000)**	**(2001-2010)**	**(2011-2016)**
Average ICOR	4.9	15.3	16.3	11.0	20.5
Capital Productivity	-2.7	-1.1	-0.2	1.7	1.4
Labour Productivity	1.9	0.1	3.2	3.8	0.9
Total-Factor Productivity	-0.2	-0.3	-0.2	2.7	1.9

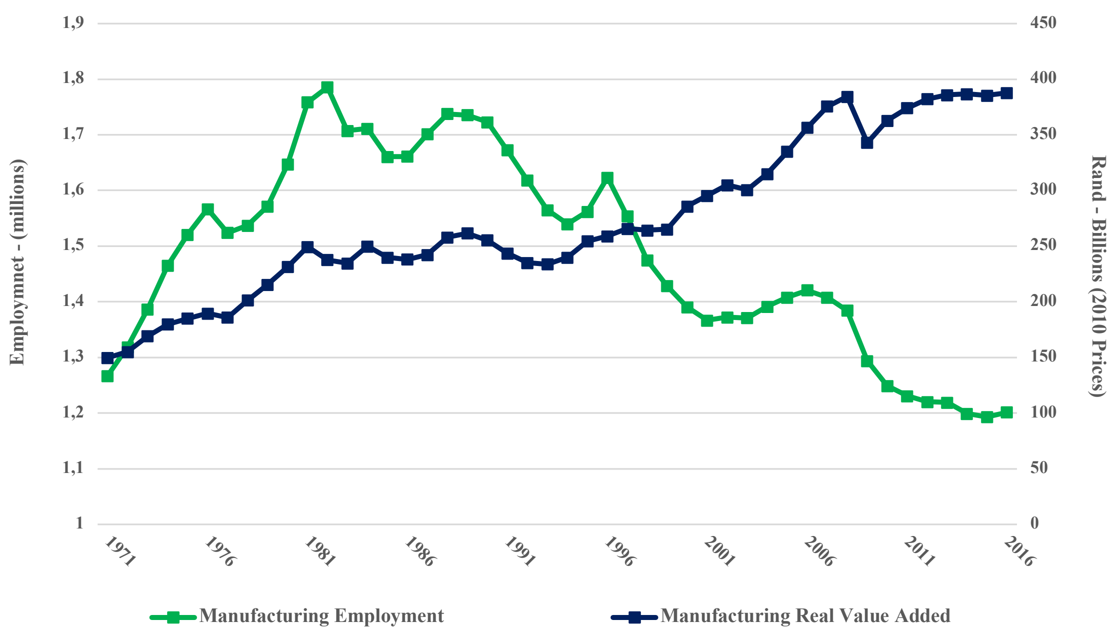
Source: Department of Trade and Industry (DTI)
Author's own calculations.

occurring over the same period. Similar views are expressed by Levy (1992:5) and the DTI (2011), where it is noted that much of the gains in LP have been driven by increasingly capital-dependent production activities.

The implication of an increase in capital inputs is that fewer *(or the same number of)* workers are required to produce the same (*or higher*) levels of output. Indeed, as *Figure 1.3* below illustrates, this has undoubtedly been the case. The figure presents manufacturing employment on the left-hand axis, while manufacturing value-added is presented on the right-hand axis. From as early as 1981, manufacturing employment was already in significant decline, while manufacturing value-added had continued to increase, implying a reduction in labour's contribution to manufacturing value-added.

The gains in LP can also be explained by the composition of production in the manufacturing sector as a whole. As capital-intensive industries in the manufacturing sector necessarily require less labour per unit of output produced, labour will inherently be more

Figure 1.3 Manufacturing Value Added & Employment



Source: Department of Trade and Industry (DTI)

productive in these industries. Thus, if capital-intensive industries expand their contribution to aggregate output relative to more labour-intensive industries, aggregate manufacturing LP must, by definition, increase as well (and *vice versa*) (Rankin, 2018; Rankin, 2016).

These compositional changes in the production structure (i.e. the capital-labour ratio) occur within individual industries as well. This can usefully be explained within the context of improved levels of technology encompassing the production process. As the level of technology in capital inputs increases, the number of employees required to produce the same level of output is reduced (Lawrence, 2018:2-3. This effect is evident in labour and capital-intensive industries alike, albeit to varying degrees. Thus, not only are capital-intensive industries becoming less labour-demanding but labour-intensive industries themselves may also be less labour-demanding (Lawrence, 2018:3).

Jonsson and Subramanian (2001:208) offer a different explanation for the rises in LP. The authors argue that much of the aforementioned gains in LP have been derived from trade liberalization, occurring from as early as the 1990s, rather than capital inputs. This view is supported by Edwards and Golub (2004:16); Edwards and Jenkins (2015:456-460), Edwards and Behar (2005:2-3); and Rankin (2016). To some extent *Table 1.2* affirms these views, citing average gains in LP of 3.8% per annum between 2001 and 2010, a period characterized by an increasingly outward-oriented focus. In the presence of increased global competition, firms have been forced to streamline operations in order to become (or remain) competitive in local as well as global markets, whilst firms unable to do so have invariably exited the market (Black and Hasson, 2012:6). The exit of less productive firms in the face of foreign competition is likely to further account for the observed aggregate productivity gains in the sector.

While the period between 1972 and 2000 was characterized by large gains in LP, they were not large enough to offset the declines in CP and consequently, TFP declined over the same period. Given that TFP is calculated using a weighted average of the relative factor endowments in the production process (Department of Trade and Industry [DTI], 2011:33), the declining labour-intensity in the economy ensured that LP gains were not enough to improve overall efficiency. These results are reaffirmed by Edwards and Golub (2004:12-13), who note that aggregate changes in TFP in South African manufacturing have generally lagged comparator economies since the 1970's.

The lack of TFP gains in South African manufacturing can be better understood in terms of the ICOR presented in *Table 1.2*, which is calculated as the ratio of incremental increases in investment divided by incremental increases in output. The ICOR is useful in this regard as it sheds light on the extent to which investments are being used efficiently, with an increase in the ICOR revealing some combination of lower productivity and increased capital intensity (Taguchi and Lowachai, 2015:1-2). Thus, an increase in a country's ICOR over time implies that capital investments are deployed inefficiently on a consistent basis, while a decrease in ICOR signifies an improvement in the allocative efficiency of capital investment (Taguchi and Lowachai, 2015:3-5). *Table 1.2* reveals that the ICOR in South African manufacturing increased significantly between 1972 and 2000 from nearly 5:1 to over 16:1. Levy (1992:6) notes that the ICOR of South African manufacturing was significantly higher than Taiwan, Korea, Malaysia and Mexico over the same period, highlighting the indiscriminate and ineffectual increase in capital investment occurring in South African manufacturing relative to output. Despite a decline in the ICOR between 2001 and 2010, characterizing a period of strong output growth and more productive capital utilization, the ICOR still remains at high levels in South Africa.

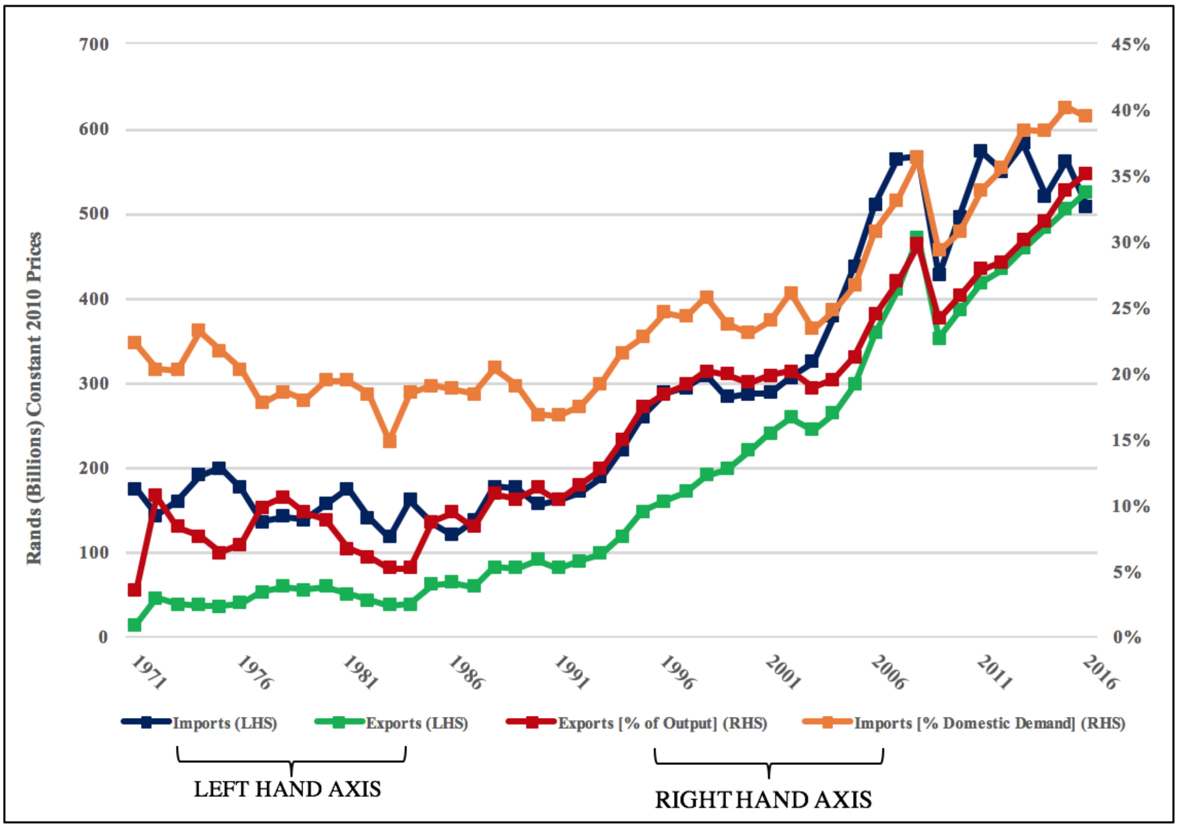
1.4 Increased Exports

As previously discussed, trade liberalization has been a central feature of industrial policy since 1994, heralding a new period of increased globalization of the South African economy. *Figure*

1.4 presents data on South African manufactured exports and imports on the left-hand axis (R-billion 2010 constant prices), while the right-hand axis presents exports as a percentage of total output, and imports as a percentage of total domestic demand.

Figure 1.4 highlights the impact of trade liberalization on the trade of manufactured goods. Between 1971 and 1991, the trade of manufactured goods (both exports and imports) was stagnant highlighting the inward-orientation of the economy under the apartheid government. By 1991, the real import value of manufactured goods was roughly similar to 1971 levels, with imports of manufactured goods constituting only 16.8% of total domestic demand. Similarly, growth in the real value of exports between 1971 and 1991 was negligible, with only 11.5% of total manufactured output in 1991 destined for the export market. Between 1994 and 2016, the real value of manufactured imports more than doubled, growing at a

Figure 1.4 Trade Performance of South African Manufacturing



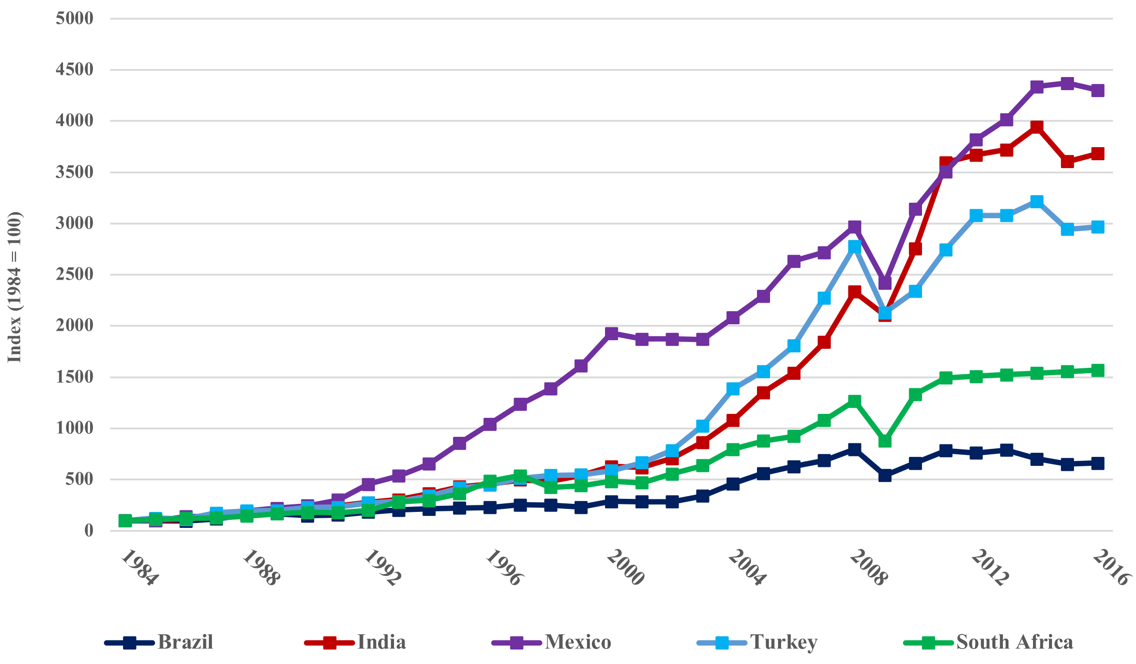
Source: Department of Trade and Industry (DTI).
Author's own calculations.

compound rate of 3.9% per annum, with manufactured imports constituting approximately 40% of domestic demand by 2016. Similarly, manufactured exports grew at a compound rate of 6.9% per annum between 1994 and 2016, with export value more than three times 1994 levels by 2016, constituting 35% of total manufactured output produced.

However, in the context of declining employment in South African manufacturing, the export boom occurring since 1994 has failed to deliver the required impetus on job creation. As noted by Black *et al* (2017:1), manufactured exports are even more capital-intensive than aggregate manufacturing output, while Bell and Cattaneo (1997) note that imports are relatively labour-intensive. The implications for job creation in South Africa are equally concerning when one considers the positive employment and growth outcomes that countries such as China and other East Asian nations have been able to achieve on the back of rapid export growth (Asian Development Bank, 2015:87-89).

In addition to the composition of import and exports, *Figure 1.5* reveals that South

Figure 1.5 Export Growth in Manufacturing of Comparator Countries



Source: World Development Indicators
Author's own calculations

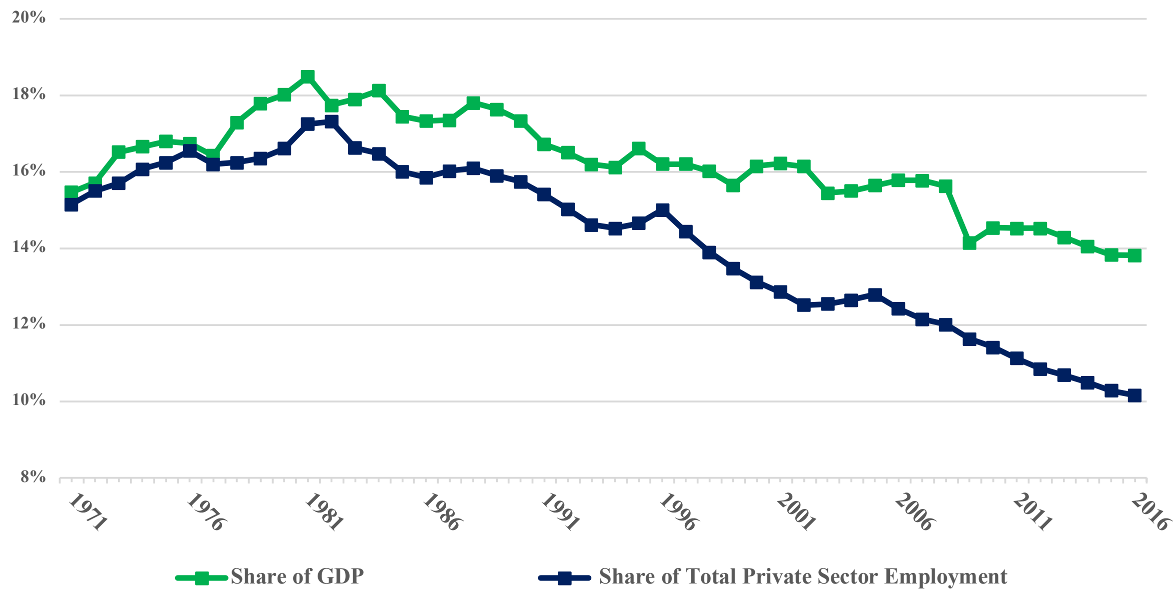
African manufactured exports have not grown as fast as various comparator countries. The figure displays, as an index, the growth of nominal dollar value manufactured exports of Brazil, India, Turkey, Mexico and South Africa between 1984 and 2016. *Figure 1.5* reveals that growth in South African manufactured exports has significantly underperformed three of the four comparator countries, with only Brazil achieving slower export growth. Implicitly, the employment benefits that have accrued from the rapid export-oriented growth in East-Asia seem not to be materializing in the South African case.

1.5 ***De*****industrialization in South Africa**

Consider the data provided in *Figure 1.6* below, which displays the share of manufacturing value-added in GDP and manufacturing employment as a share of total private sector employment between 1971 and 2016. *Figure* 1.6 indicates that South African manufacturing's relative contribution to GDP has consistently declined since the early 1990s. After a period of strong industrial-based growth in the 1970s, manufacturing's share of GDP has fallen from roughly 19% in 1981 to 13.8% in 2016, declining at an average compound rate of 0.8% per annum, this despite the considerable policy assistance targeted at growing South Africa's industrial base.

Table 1.3 provides a comparative context for this outcome, displaying the manufacturing share of GDP for 5 emerging market (EM) economies in 2000 and 2016 namely: Brazil; China; India; Mexico and Turkey. *Table 1.3* reveals that the process of deindustrialization is not unique to South Africa. In fact, manufacturinges share of GDP has declined in all 5 comparator countries since at least 2000. However, what is unique in the South African experience, is the pace at which this apparent trend of deindustrialization has occurred. For example, between 2000 and 2016, manufacturing's contribution to GDP in South Africa declined by a total of 31%. Although all five comparator countries demonstrated similar declines in manufacturing's contribution to GDP over the same period, these declines were less significant (*Brazil: 22%; China 22%; India 8%; Mexico 12%; Turkey 11%*).

Figure 1.6 SA Manufacturing Share of GDP & Private Sector Employment



Source: World Development Indicators (WDI), World Bank; Department of Trade and Industry (DTI).
Author's own calculations.

Table 1.3 Manufacturing Share of GDP in South Africa and Comparator Countries

Manufacturing Share of GDP (%)						
Country	**Brazil**	**China**	**India**	**Mexico**	**Turkey**	**South Africa**
Manufacturing Share of GDP (2000)	13.1%	37.0%	16.5%	19.0%	18.8%	18.5%
Manufacturing Share of GDP (2016)	10.3%	28.8%	15.3%	16.8%	16.6%	13.8%
Percentage Change (2000-2016)	-22%	-22%	-8%	-12%	-11%	-31%

Source: World Development Indicators (WDI), World Bank; Department of Trade and Industry (DTI).
Authors own calculations.

In the South African case, where real GDP growth has been less than 3% since 2011, and only 0.6% in 2016, a declining share of manufacturing in GDP is clearly indicative of the poor growth performance of South African manufacturing in general. This is confirmed when considering the data presented in *Table 1.4* below. Since 2004, South Africa has consistently underperformed in terms of manufacturing growth relative to China, India, Mexico and Turkey, with only Brazil posting an equally poor growth performance in the sector. In the context of an increasingly open and competitive global economy, an apparent lack of competitiveness in the South African manufacturing sector has been exposed, resulting in slow growth in exports, and greater import competition from foreign producers (Raubenheimer, 2015; Edwards and Jenkins, 2015:447-449; Edwards and Bahar, 2005:2-3).

Table 1.4 Manufacturing Average Annual Growth Rates in South Africa and Comparator Countries

Manufacturing Average Annual Growth Rates (%)						
Country	**Brazil**	**China**	**India**	**Mexico**	**Turkey**	**South Africa**
Percentage Change (2000 – 2004)	6.8	5.5	6.0	-1.9	1.5	2.5
Percentage Change (2005 – 2008)	2.6	12.1	9.2	1.4	4.5	1.0
Percentage Change (2009 – 2012)	-3.3	8.8	5.6	2.8	4.8	-3.4
Percentage Change (2013 – 2016)	-1.8	4.9	6.4	3.4	6.9	2.3

Source: World Development Indicators (WDI), World Bank; Department of Trade and Industry (DTI).
Author's own calculations

1.6 Conclusion

Section 1 has detailed the rapid expansion in aggregate capital-intensity in South African manufacturing on the one hand with a concomitant decline in manufacturing employment on the other, reviewing the period 1972 to 2016. These outcomes have undoubtedly been shaped by numerous industrial policy decisions that sought to encourage large-scale capital investment by reducing the UCC. Moreover, where job creation has been a stated intention of industrial policy – most notably post-1994 – these policies have lacked the nous to provide any meaningful impetus to job-creation. Thus, while the sector achieved modest manufacturing growth between 1997 and 2008, much of this has proven to be not only job*less* growth, but also job-*shedding* growth, as the sector now employs fewer people than it did in 2008 (Nattrass and Seekings, 2019; Edwards and Behar, 2005:16).

The pace at which growth in manufacturing capital stock has outstripped employment has had detrimental effects for overall efficiency, despite the apparent (and expected) LP gains. Capital investment has consistently failed to deliver any meaningful productivity gains, with negative productivity gains recorded over various periods in the fast four decades. The gains in LP have not been great enough to offset this, resulting in meagre TFP gains over the same period. Moreover, if one considers the millions of South Africans currently unemployed and unproductive, the continued investment in capital-intensive industries where job-creation potential is limited this has had tremendously adverse effects on economy-wide productivity as well (Black *et al*., 2017:12).

South Africa's export performance has done little to alleviate the unemployment crisis, with significant growth in manufactured exports since 1994 not delivering the expected impetus for job creation. Over the same period, manufacturing growth failed to keep pace with the rest of the South African economy, reflecting a trend of deindustrialization and a falling share of manufacturing in GDP. This trend has accelerated in wake of the 2008 financial crisis, as South African manufacturing continues to underperform relative to other comparable economies in a competitive and globalized market. The slowdown in manufacturing growth has further compounded its already underwhelming contribution to private sector employment, punctuating the sector’s failure to deliver meaningful job-creation in South Africa.

SECTION 2 – A Sub-Sectoral Analysis of South African Manufacturing

To fully account for the trends in the South African manufacturing sector in aggregate and the impact of these on employment levels, it is necessary to analyze manufacturing at a sub-sectoral level[4]. This allows for differentiation between changes in sub-sectoral factor-intensity in production, or sectoral changes in the composition of aggregate production.

Two important questions must be answered in this regard. Firstly, has the increased aggregate capital-intensity in manufacturing been driven by sub-sectors becoming relatively more capital-intensive in general, or has this been driven by a shift in the distribution of aggregate output to capital-intensive rather than labour-intensive sub-sectors? And secondly, has increased capital investment made sub-sectors relatively more or relatively less productive? This analysis is critical not only to answer these questions, but to provide clarity on how investment and growth in various manufacturing sub-industries demands a simultaneous increase in employment, thus highlighting the industries with the greatest job-creation potential.

This paper defines sub-sectors as either *ultra-capital-intensive* (UCI); *capital intensive* (CI); *intermediate-capital-intensive* (ICI); *labour-intensive* (LI) and *ultra-labour-intensive* (ULI). A similar classification approach has been used by (Black *et al.*, 2017) and Bell and Cattaneo (1993). This classification differs in that it adds an additional category, namely UCI. The results of this classification are presented in *Table 2.1*.

[4] For ease of reference, the analysis will consistently classify sub-sectors according to their factor-intensity using the respective capital-labour ratios in 2016. This classification will be used throughout the remainder of the paper.

Table 2.1 Categorization of Manufacturing Industries by Factor-Intensity

Industry	Factor-Intensity
Coke and Petroleum Products	Ultra-Capital-Intensive (UCI)
Basic Chemicals	
Non-Ferrous Metals	
Other Chemicals	
Beverages	
Glass	Capital-Intensive (CI)
Paper and Paper Products	
Basic Iron and Steel	
Non-Metallic Minerals	
Motor Vehicles	
Tobacco	
Rubber	Intermediate-Capital-Intensive (ICI)
Other Manufacturing	
Food	
Printing and Publishing	
Other Transport Equipment	
Machinery	Labour-Intensive (LI)
Textiles	
Plastics	
TV, Radio and Communication Equipment	
Electrical Machinery	
Professional and Scientific Equipment	
Metal Products	
Wood	
Leather and Leather Products	Ultra-Labour-Intensive (ULI)
Footwear	
Furniture	
Clothing	

Source: Department of Trade and Industry (DTI)
Author's own calculations.

2.1 Sub-Sectoral Composition and Production Output

Table 2.2 below presents each sub-sector's shares of real output, employment and real capital stock in South African manufacturing between 1972 and 2016, while *Table 2.3* presents each sub-sector's average annual growth rates of real output, real capital stock, and share of employment between 1972 and 1994, and between 1995 and 2016 respectively. In addition, *Table 2.3* presents the compound average annual growth rates of the K/L ratio in each sector.

By analyzing changes in the sectoral composition of South African manufacturing in *Table 2.2*, one can determine the extent to which the overall growth in capital-intensity is derived from changes in each sub-sector's relative share of total output. Similarly, an analysis of the sub-sectoral growth rates in *Table 2.3* reveals the extent to which these changes are derived from a contraction in labour-intensive sub-sectors or the relative expansion of capital-intensive sub-sectors. Furthermore, the analysis of the capital-labour ratios in *Table 2.3* sheds light on the extent to which the growing capital-intensity in South African manufacturing has been driven by changes in factor-intensity within different sub-sectors. Once again, these changes will be referred to in relation to events *pre* and *post*-1994.

Table 2.2 confirms the rising capital-intensity in production that was cited in *Section 1.1* above. In 1972, Ultra-Capital Intensive (UCI) and Capital Intensive (CI) industries accounted for a combined share of 43% of total real output, increasing to 55% by 2016. In contrast, Labour Intensive (LI) and Ultra-Labour Intensive (ULI) industries saw a decline in their combined share, accounting for roughly 32% in 1972 and only 22% by 2016. The share of total output in ICI industries also declined from 25% in 1972 to 22% in 2016. A notable feature of the continued dominance of capital-intensive production in the manufacturing sector is the increased share of output in UCI industries, much of which is attributable to the so-called

Table 2.2 Share of Real Output, Capital Stock & Employment by Industry

Real output [Rm 2010 prices]	Share of Real Output					Share of Capital Stock					Share of Employment				
	1972	1986	1996	2006	2016	1972	1986	1996	2006	2016	1972	1986	1996	2006	2016
Ultra-Capital-Intensive - Total	**15.36**	**23.12**	**25.92**	**27.80**	**27.63**	**24.86**	**41.57**	**52.90**	**51.12**	**51.61**	**8.77**	**11.03**	**9.74**	**11.71**	**13.17**
BASIC CHEMICALS	3.81	5.12	5.05	6.27	5.65	5.43	11.01	7.64	11.38	10.34	1.56	1.98	1.83	2.08	1.76
BEVERAGES	3.73	7.08	5.58	4.22	4.17	3.71	4.24	4.97	4.46	4.88	2.76	3.42	2.90	2.31	3.19
COKE AND PETROLEUM PRODUCTS	2.34	4.10	5.14	7.07	7.13	7.26	19.48	29.68	24.73	24.12	0.68	1.08	0.89	1.43	1.88
NON-FERROUS METALS	1.71	2.22	3.86	2.73	2.76	3.42	2.50	7.29	6.79	4.60	2.11	2.47	1.86	1.77	1.53
OTHER CHEMICALS	3.78	4.59	6.29	7.51	7.92	5.04	4.34	3.31	3.76	7.67	1.65	2.09	2.25	4.11	4.81
Capital-Intensive - Total	**27.52**	**24.63**	**23.57**	**28.36**	**27.61**	**33.68**	**28.87**	**22.48**	**23.74**	**21.82**	**27.65**	**25.73**	**22.97**	**20.99**	**20.38**
MOTOR VEHICLES	10.24	7.11	8.77	12.73	11.04	6.99	5.54	5.02	9.43	9.06	9.56	9.59	9.14	9.38	9.23
BASIC IRON AND STEEL	6.33	6.64	5.77	7.33	9.11	13.64	8.89	9.08	5.36	3.63	5.86	5.64	3.84	2.73	2.94
GLASS	0.77	0.65	0.67	0.63	0.47	0.72	0.92	0.73	0.78	0.93	1.08	0.86	0.94	0.82	0.70
NON-METALLIC MINERALS	5.21	3.95	3.33	2.85	2.35	7.08	6.83	3.87	3.36	4.09	8.87	7.56	6.63	5.15	4.00
PAPER AND PAPER PRODUCTS	3.73	4.75	3.91	4.04	3.84	4.55	6.17	3.51	4.62	4.04	1.76	1.80	2.11	2.64	3.10
TOBACCO	1.25	1.53	1.13	0.78	0.79	0.71	0.52	0.27	0.18	0.06	0.51	0.28	0.31	0.28	0.41
Intermediate-Capital-Intensive - Total	**25.10**	**24.73**	**24.95**	**21.65**	**22.55**	**17.49**	**12.75**	**13.13**	**14.76**	**16.57**	**23.98**	**24.20**	**25.96**	**24.66**	**26.87**
FOOD	14.58	16.07	15.38	13.32	14.79	9.76	8.21	9.09	8.84	10.87	13.12	14.10	14.93	13.53	16.74
OTHER TRANSPORT EQUIPMENT	2.74	1.31	0.78	1.00	0.88	1.76	0.90	0.84	0.58	0.65	2.81	1.81	1.34	1.15	1.39
OTHER MANUFACTURING	3.43	2.98	4.75	4.13	3.59	1.40	0.69	0.84	3.39	2.22	4.02	4.24	5.15	4.32	3.37
PRINTING AND PUBLISHING	3.08	3.32	2.89	2.17	2.36	2.96	2.08	1.57	1.28	2.11	2.51	2.71	3.18	4.64	4.42
RUBBER	1.28	1.05	1.14	1.03	0.94	1.61	0.87	0.79	0.68	0.71	1.51	1.34	1.36	1.02	0.95
Labour-Intenisve - Total	**28.37**	**23.45**	**21.54**	**18.94**	**19.32**	**21.39**	**15.11**	**10.41**	**9.55**	**9.21**	**29.60**	**28.22**	**28.98**	**32.72**	**32.24**
MACHINERY	8.16	5.08	4.97	4.17	4.50	3.93	3.39	1.79	2.13	3.14	6.70	6.94	6.10	7.33	9.10
METAL PRODUCTS	10.31	7.65	6.22	4.88	5.32	5.28	3.89	3.32	2.63	1.87	8.54	7.80	7.76	8.80	8.05
PLASTICS	1.21	1.75	2.67	2.41	1.62	1.04	1.02	1.29	1.13	1.11	1.24	2.00	2.92	3.85	3.50
PROFESSIONAL & SCIENTIFIC EQUIP	0.29	0.52	0.40	0.48	0.48	0.22	0.19	0.12	0.23	0.24	0.43	0.55	0.64	0.85	0.94
TV, RADIO & COMM. EQUIP	0.88	1.28	0.79	0.72	0.85	0.69	0.59	0.30	0.26	0.17	0.45	0.47	0.80	0.57	0.59
TEXTILES	3.17	2.68	1.97	1.45	1.48	5.68	2.64	1.55	1.27	0.88	7.43	5.67	4.59	3.10	2.68
WOOD	2.13	2.11	2.03	2.07	2.39	2.35	1.46	1.00	1.09	0.79	2.78	2.72	3.15	4.60	3.68
ELECTRICAL MACHINERY	2.21	2.37	2.48	2.78	2.67	2.20	1.93	1.03	0.81	1.02	2.03	2.07	3.03	3.62	3.70
Ultra-Labour-Intensive - Total	**3.64**	**4.07**	**4.02**	**3.25**	**2.90**	**2.59**	**1.69**	**1.09**	**0.84**	**0.79**	**10.00**	**10.82**	**12.35**	**9.93**	**7.35**
CLOTHING	1.54	1.86	1.83	1.10	1.19	1.64	0.91	0.48	0.35	0.26	5.46	5.96	7.21	5.96	3.83
FOOTWEAR	0.90	0.82	0.64	0.49	0.47	0.36	0.21	0.17	0.09	0.11	1.90	1.92	1.56	0.58	0.70
FURNITURE	0.98	1.13	1.28	1.34	0.93	0.46	0.48	0.36	0.27	0.33	2.03	2.39	3.11	2.95	2.38
LEATHER AND LEATHER PRODUCTS	0.23	0.27	0.26	0.31	0.30	0.13	0.08	0.08	0.12	0.09	0.62	0.55	0.46	0.43	0.44

Source: Department of Trade and Industry
Authors own calculations

Table 2.3 Average Annual Growth Rates of Output, Investment, Employment & Capital/Labour Ratios

	Average Annual Growth Rates (%)							
	(1972 - 1994)				(1995 – 2016)			
	Output	Invest.	Emp.	K/L	Output	Invest.	Emp.	K/L
Other Chemicals	5.4	3.5	2.4	-0.0	4.4	4.1	2.2	2.0
Basic Chemicals	4.4	5.8	2.3	3.2	4.0	1.9	-1.7	3.7
Beverages	5.6	6.3	2.0	4.0	1.2	-0.02	-1.2	-1.0
Coke & Petroleum Products	7.9	12.4	2.5	9.4	5.0	-0.9	2.7	-2.9
Non-Ferrous Metals	5.5	7.3	1.0	4.7	4.0	-0.01	-2.0	1.1
Motor Vehicles	2.6	3.3	0.1	2.9	4.7	3.1	-0.8	4.3
Basic Iron & Steel	4.1	6.5	-0.4	3.2	5.4	-3.2	-2.5	-1.0
Tobacco	3.5	1.36	-0.3	2.8	0.9	-7.4	0.01	-7.2
Glass	2.8	3.9	0.9	3.0	1.3	3.0	-2.6	5.0
Paper & Paper Products	3.9	3.8	1.8	1.4	2.7	1.3	0.4	0.8
Non-Metallic Minerals	1.1	2.1	-0.1	0.5	1.5	0.7	-3.3	4.8
Food	3.3	3.6	1.3	1.7	2.7	1.8	-0.5	2.0
Other Transport Equipment	-2.0	1.1	-2.6	3.2	5.1	0.1	0.2	0.0
Other Manufacturing	5.3	3.0	1.9	0.1	1.3	5.0	-2.6	6.7
Rubber	3.1	1.5	0.2	1.3	1.9	-0.1	-2.5	2.8
Printing & Publishing	3.2	1.2	2.2	-1.5	1.5	2.9	0.2	2.0
Machinery	0.9	1.5	0.3	1.6	2.8	2.6	1.0	2.2
Metal Products	0.9	2.6	0.7	1.3	2.3	-2.2	-0.9	-1.9
Electrical Machinery	4.2	2.0	2.7	-0.8	3.3	-0.02	-0.01	0.1
Plastics	7.3	5.3	4.7	-0.1	0.6	0.2	-0.1	0.5
Professional & Sci. Equipment	5.5	2.2	3.3	-0.3	3.6	3.4	0.7	3.2
TV, Radio & Comm. Equipment	5.0	1.3	4.3	-2.9	2.1	-1.8	-1.6	-0.1
Textiles	1.2	-1.1	-1.4	0.3	1.3	-2.5	-3.0	-0.5
Wood	2.7	0.8	1.6	-1.1	3.5	-0.1	-0.5	-0.8
Clothing	4.1	-0.8	1.6	-3.4	0.7	-2.5	-3.1	0.3
Leather & Leather Products	3.4	2.6	0.6	1.6	3.8	0.6	-1.8	2.7
Footwear	2.3	1.4	0.6	0.9	0.8	-1.6	-4.8	3.5
Furniture	4.5	2.6	2.7	-0.5	1.8	1.0	-2.2	2.9

Source: Department of Trade and Industry (DTI)
Authors own calculations

MEC (mineral-energy-complex) referred to in *Section 1.2.2* For example, the largest relative growth has been in the *coke and other petroleum products* sub-sector, increasing its share of total output by 4.8 percentage points (PPs), followed by *other chemicals* (4.1 PPs); *basic iron and steel* (2.78 PPs) and *basic chemicals* (1.8 PPs). At the same time, relatively labour-intensive industries have seen their share of total output decline, exemplified by declines in the share of total output from the *metal products* (5 PPs); *machinery* (3.7 PPs) and *textiles* industries (1.7 PPs). As the structure of aggregate production in the sector has increasingly shifted to relatively capital-intensive industries, this has inevitably resulted in a change in aggregate demand for capital relative to labour, at least in part accounting for the large divergence between capital stock and employment in the manufacturing sector as demonstrated in *Section 1.1.*

Interestingly, *Table 2.2* reveals that since 2006, the UCI and CI industries have experienced a decline in their respective shares of aggregate real output in the sector, while the ICI and LI industries have expanded their shares of real output. This indicates that aggregate production has become slightly more labour-intensive since 2006, further evidenced by the falling aggregate capital-labour ratio (K/L) since 2012. Nonetheless, aggregate production is still heavily concentrated in industries that have demonstrated very weak employment generating potential. This point is further highlighted below, where the distribution of investment and employment in the manufacturing sector is considered.

2.2 Composition of Sub-Sectoral Capital Stock and Employment

Given the growth of real output in UCI and CI industries relative to LI and ULI industries, it is perhaps unsurprising that a similar picture emerges when analyzing the distribution of capital stock between the different sub-sectors. In 1972, the share of capital stock was heavily concentrated in the UCI and CI industries, accounting for a combined share of 58.6% of aggregate manufacturing capital stock. In contrast, LI and ULI industries accounted for only 24% of total capital stock, while ICI industries accounted for 17.5%. By 2016, investment was even more heavily concentrated in capital-intensive industries, where the share of capital stock in UCI and CI industries reached 73% by 2016. Even if aggregate production was distributed evenly amongst all industries in the sector, one would expect that UCI and CI industries would nevertheless still command a greater share of total capital stock, simply because more capital is required in the production of one unit of output. Thus, it is expected that the share of capital stock in these industries would have increased as well.

Similarly, the large share of total employment in LI and ULI industries relative to their shares of overall production is equally unsurprising. However, what is alarming is that the industries that have received the largest share of capital-investment, namely UCI and CI industries, have failed to deliver any meaningful employment growth in the sector. For example, industries such as *coke and petroleum; motor vehicles; non-ferrous metals* and *basic chemicals* (all either CI or UCI industries) have all increased their share of capital stock significantly since 1972, but with next to no improvement in their respective shares of aggregate manufacturing employment. It is important to note that in the context of declining aggregate manufacturing employment between 1982 and 2016 (see *Section 1*), a declining or constant share of employment over the same period reflects – by definition – falling levels of employment.

Conversely, in the context of rapid increases in aggregate capital stock (see *Section 1.1*), increasing shares of capital stock imply an increase in the actual levels of capital stock. These outcomes are indicative of capital-deepening. In contrast, LI industries share of total capital-stock has declined significantly since 1972, while the share of total manufacturing employment in these industries increased by 2.6 percentage points despite falling shares of aggregate output. This clearly indicates the importance of LI and ULI industries for employment creation in the sector and the equally poor employment generating capacity in CI and UCI industries. The fact that investment – and consequently growth – have not occurred in LI and ULI industries has had enormous consequences for aggregate manufacturing employment as described in *Section 1*.

2.3 Sub-Sectoral Growth *Pre-1994*

Table 2.3 reveals that strong growth in real output was achieved in a majority of the sub-sectors under consideration *pre*-1994. Indeed, the significant trade protection in the economy at the time enabled this growth to an extent, allowing domestic producers to supply the domestic market with limited competition from foreign product substitutes. While growth in output was achieved in even the most labour-intensive industries in the sector, a notable feature of the sectoral performance pre-1994 is the pace at which various UCI sub-sectors were able to expand production. *Coke and petroleum products* (7.9% per annum)*; beverages* (5.6% per annum)*, other chemicals* (5.4% per annum) and *non-ferrous metals* (5.5% per annum) all achieved average growth in real output in excess of 5% per annum.

Table 2.3 further reveals that much of the output growth in these industries, with the exception of the *other chemicals* industry, was derived from rapid increases in capital inputs, with little corresponding increase in employment. Capital investment in the *coke petroleum products* industry grew at an average rate of 12.4% per annum, with 6.3% per annum in the *beverages industry* and 7.3% per annum in the *non-ferrous metals* industry. The corresponding employment growth for these industries was only 2.5%; 2% and 1% per annum respectively. A similar picture emerges when looking at the CI industries. For example, the *basic iron and steel* industry achieved an average real output growth rate of 4% per annum with capital investment growing by 6.5% and employment levels declining by 0.4% per annum. Similarly, the *motor vehicles* industry had a growth in capital investment of 3.3% while employment growth was on average negligible, increasing by only 0.1% per annum. These outcomes in UCI and CI industries alike reveal trends of capital *deepening* rather than capital *widening*. Consequently, increased investment and growth did not result in a corresponding increase in employment.

In contrast to the capital *deepening* occurring in UCI and CI manufacturing industries, *Table 2.3* reveals trends of capital *widening* in LI and ULI industries over the same period, confirming that increased capital investment and growth in these industries resulted in substantial employment gains as well. The table reveals that LI and ULI industries also achieved strong growth under ISI strategies with the *plastics* industry, the *professional and scientific equipment* industry and the *TV, radio and communications equipment* industry achieving average growth in real output of 7.3%, 5.5% and 5% per annum respectively. At the same time investment in capital stock in these industries increased at an average rate of 5.3%, 2.2% and 1.3% per annum respectively, while employment also increased by 4.7%, 3.3% and 4.3% per annum respectively.

2.4 Sub-Sectoral Growth *Post*-1994

As noted in *Section 1.2.2*, industrial policy strategy *post*-1994 has increasingly emphasized the need to diversify the manufacturing base by moving away from resource-based manufacturing and promoting growth in non-traditional industries. Although there has been some success in this regard (Edwards and Lawrence, 2006:12; Edwards *et al*., 2008:5), *Table 2.3* reveals that a majority of output growth has still been driven by industries which comprise South Africa's MEC, all of which are highly capital-intensive. For example, the *basic chemicals, other chemicals, coke* and *petroleum products*, *basic iron* and *steel* and *non-ferrous metals* industries have all achieved growth in real output of 4% or greater per annum since 1994. Moreover, *Table 2.3* indicates that of what little diversification there has been in South Africa's industrial base, this has continued to occur in relatively capital-intensive industries that have demonstrated poor employment outcomes since 1994. For example, a notable success story *post*-1994 has been the growth in the South African *motor vehicles* industry which has achieved an average growth in real output of 4.7% per annum. Yet despite this growth, employment in the *motor vehicles* sector has declined on average by 0.8% per annum, with the industry becoming increasingly capital-intensive, signified by an average growth in the capital-labour ratio of 4.3% per annum since 1994. In contrast to the growth in UCI and CI industries since 1994, LI and ULI industries have failed to demonstrate similar resilience in the face of increasing global competition. None of the LI and ULI industries reviewed has achieved an average growth in real output of greater than 4% per annum, while those LI and ULI industries that have demonstrated modest growth (for example: *wood, electrical machinery* and *prof. and sci. equipment* industries), have done so off a relatively small base (*see Section 2.1*).

The slow growth of labour-intensive industries relative to capital-intensive industries can in part account for the rising capital-intensity in aggregate manufacturing. However, the rising capital-intensity within certain industries, in other words capital-deepening, has also been a contributing factor. *Table 2.3* reveals that of the 28 sectors included in this analysis, 20 of them demonstrated increases in the capital-labour ratio since 1994, while 20 industries demonstrated average declines in employment levels. This has also been the case in relatively labour-intensive industries that have managed to achieve some degree of output growth. For example, much of the growth in the ULI *leather products* industry is derived from supplying inputs to support output in the *motor vehicles* industry. Yet despite this, employment levels in the *leather products* industry have declined (-1.8% per annum on average), while the capital-labour ratio has grown at an average rate of 2.7% per annum. Thus, the rising capital-intensity in aggregate manufacturing has been driven by some combination of the expansion of UCI and CI industries relative to more labour-intensive industries, as well as the trend of capital-deepening occurring across most manufacturing industries. Yet despite this fact, the shares of aggregate employment highlighted in *Table 2.2* indicate that LI and ULI industries still remain significant contributors to aggregate employment.

2.5 Productivity and Investment Decisions

Table 2.4 presents data on the sub-sectoral shares of new fixed investment, as well as the sub-sectoral compound annual growth rates of capital productivity (CP) and total factor productivity (TFP) between 1972 and 1994 and between 1995 and 2016. The table reveals that prior to 1994, capital investments were not deployed productively in those industries that commanded the largest shares of new investments. For example, the *coke and petroleum products*; *basic chemicals* and *basic iron* and *steel* industries received a combined share of 36.5% of all new investments, while CP and TFP gains in these industries were negative, implying a lack of efficiency in the investment decisions made. Undoubtedly, State investments in large-scale mega-projects such as Sasol played a significant role in this regard. Mohamed (1997:11) notes that the rapid increases in public foreign debt required to fund large-scale projects in capital and energy-intensive industries may have crowded out investment in other industries in the manufacturing sector. For example, Mohamed (1997:10) cites that State borrowing between 1970 and 1976 accounted for 96% of total foreign denominated debt leading to a balance of payment deficit exceeding 5% of GDP. Consequentially, foreign and domestic banks were less willing to lend money to private sector investors for projects in other industries.

Furthermore by 1990, State-owned power utility Eskom accounted for 45% of public foreign debt and 16% of total foreign debt in South Africa. In short, industrial policies seeking to provide cheap electricity and encourage investment in resource-based production inhibited investment and diversification in other industries in the sector. As a result, relatively labour-intensive downstream industries such as the *metal products* or *plastics* industry received a significantly smaller portion of new investments, despite the reduced production costs enjoyed by large-upstream producers. By the same token, new investments increasingly flowed to industries that were not necessarily the most productive.

Table 2.4 further reveals that since 1994 productivity has improved in a majority of industries, with 20 of the 28 industries under review achieving gains in TFP, and 19 industries achieving gains in CP. On the one hand, trade liberalization has meant that firms have been forced to streamline and slim down operations in order to improve competitiveness (Thurlow, 2006:3). On the other hand, increased foreign competition has meant that firms unable to improve productivity have likely been forced to exit the market, thus also positively influencing sub-sectoral productivity levels (Rankin, 2018; Rankin, 2016:4). However, while there is a trend of increasing productivity since 1994, it is still apparent that various policy decisions continue to distort South Africa's comparative advantage. For example, while productivity has improved in relatively capital and labour-intensive industries alike, the bulk of new investments have still been made in capital and energy-intensive industries with the *basic chemicals, coke* and *petroleum products* and *basic iron* and *steel* industries accounting for 34% of new investments since 1994. Moreover, industries that have been able to increase their respective shares of new investments the most, such as the *motor vehicles* and *paper products* industries have demonstrated negative CP gains and only negligible TFP gains. In stark contrast, only one LI or ULI industry (*plastics*) has been able to increase its share of new investments since 1994. Somewhat paradoxically, the *metal products, electrical machinery, clothing* and *TV, radio and communications equipment* industries have all experienced declining shares of new investments since 1994, despite achieving positive CP and TFP gains. The productivity improvements in these industries indicate that there are pockets of relatively competitive labour-intensive activities, yet this has not resulted in a flow of investment into these industries for less productive industries. If employment creation is a primary objective of industrial policy, it would follow that government support should seek to leverage and promote these pockets of competitiveness. In reality however, State support is still heavily weighted in favour of capital-intensive production (Black and Hasson, 2012:9).

Table 2.4 Share of New Investments & the Average Annual Growth Rates of Capital Productivity & Total Factor Productivity.

	Average Annual Growth Rates (%)					
	(1972-1994)			(1995-2016)		
	Share of New Investments	CP	TFP	Share of New Investments	CP	TFP
Basic Chemicals	7.5%	-1.3	-0.5	11.4%	1.2	3.3
Beverages	4.6%	-1.3	-0.6	5.0%	-0.6	-1.0
Coke and Petroleum Products	19.5%	-6.6	-3.8	16.9%	6.9	5.4
Non-Ferrous Metals	3.8%	-0.3	2.3	3.5%	2.6	3.6
Other Chemicals	5.1%	2.7	2.6	4.4%	-0.4	1.3
Motor Vehicles	5.7%	-3.2	-2.1	10.1%	-0.1	1.8
Basic Iron and Steel	9.5%	-2.2	-1.0	5.2%	8.6	7.9
Glass	0.7%	-0.4	1.6	1.4%	-1.1	0.4
Non-Metallic Minerals	5.4%	-1.7	-2.0	4.4%	0.1	1.6
Paper and Paper Products	5.0%	-0.2	0.6	7.1%	0.8	1.0
Tobacco	0.7%	-0.8	0.2	0.2%	8.1	6.2
Food	8.9%	-0.3	0.2	9.2%	1.7	2.8
Other Transport Equipment	0.8%	-3.8	-3.2	0.8%	0.6	0.8
Other Manufacturing	1.1%	3.1	3.9	2.9%	-2.9	-2.4
Printing and Publishing	2.0%	0.5	-0.3	3.0%	-2.3	-0.7
Rubber	1.1%	0.2	0.7	1.0%	-1.1	0.3
Electrical Machinery	1.9%	1.6	1.0	1.0%	2.9	3.0
Machinery	3.3%	-1.4	-0.4	3.1%	0.4	1.5
Metal Products	4.9%	-2.5	-1.6	3.4%	4.4	2.7
Plastics	1.3%	2.1	2.0	1.5%	1.1	1.4
Professional and Scientific Equipment	0.2%	0.4	0.8	0.2%	-1.8	-0.3
TV, Radio and Comm. Equipment	0.6%	3.8	2.4	0.3%	4.3	3.5
Textiles	2.9%	0.7	0.9	1.4%	3.0	2.6
Wood	1.5%	0.7	0.4	1.4%	2.5	2.3
Clothing	1.1%	3.6	0.7	0.5%	4.9	4.9
Footwear	0.3%	-0.8	0.3	0.1%	-0.1	1.9
Furniture	0.5%	1.3	1.4	0.4%	0.2	2.0
Leather and Leather Products	0.1%	0.7	1.2	0.1%	1.6	2.7

Source: Department of Trade and Industry (DTI)
Author's own calculations.

SECTION 3 – Trade Flows, Government Assistance and Revealed Comparative Advantage

Theories of comparative advantage (CA) have been widely used to explain and measure a country's trade performance (Acharya, 2008:33). A country can benefit from international trade by specializing in the production and export of goods in which the opportunity cost of production is lowest, whilst simultaneously importing goods where there is no comparative advantage. *Section 3* will present evidence that South Africa's CA in capital-intensive production since 1994 has continued to be determined by distortive industrial policies that defy, rather than encourage, a more labour-absorbing growth path (Samson *et al*., 2001:6-7; Chang and Lin, 2009:4-5; Black *et al*., 2017:2).

3.1 Trade Flows in South African Manufacturing

3.1.1 Sub-Sectoral Export Performance

The manner in which South Africa's export-profile has evolved over time has had profound implications for the pattern of trade on the one hand, and the inclusiveness of industrialization and growth on the other (Edwards and Alves, 2006:474). While exports of South African manufacturers have grown as a share of GDP (*see Section 1.3)*, they have failed to reach the levels witnessed in East Asia and more outward-oriented manufacturing sectors in South and Central American economies (Edwards and Alvers, 2006:473; DTI, 2010:26). Moreover, South Africa's export-profile, much like aggregate production, remains highly capital and resource-intensive (Black *et al*., 2017:5).

Table 3.1 below details the share of manufactured exports in the industry in 1972, 1994 and 2016 respectively. *Table 3.1* reveals that a majority of South African manufactured exports in 1972 were derived from capital-intensive, resource-based industries such as *basic iron and steel* and *non-ferrous metals*, which accounted for a combined share of 35% of total manufactured exports. UCI and CI industries accounted for a combined share of 51% of total exports in 1972, while LI and ULI industries accounted for a combined share of only 21% of total manufactured exports, with a majority of these derived from the *machinery* and *textiles* industries. By 1994, the South African manufactures export profile had become even more capital-intensive, with UCI and CI industries accounting for 62% of total exports while LI and ULI industries accounted for only 25.6%. By 2016, the trend of increasing capital-intensity is still very much apparent, with UCI and CI industries accounting for 63% of total manufactured exports, while LI and ULI industries accounted for only 23%.

As noted previously, industrial policy post-1994 has sought to diversify South Africa's export profile by encouraging growth in non-traditional exports and becoming less dependent on resource-based exports (Black *et al*., 2017:6-7; DT, 2007:10-12). In this regard, there has been a degree of success, both in terms of increasing exports (*see Section 1.3*) and diversifying exports. However, much of this diversification has occurred in capital-intensive industries such as the *motor vehicles* industry (Black *et al.,* 15-17), which increased its share of manufactured exports significantly from 3.5% in 1994 to 17% in 2016. In contrast, apart from the notable improvement in the export share of the *machinery* industry (from 6.9% in 1994 to 11.7% in 2016), there has been no significant improvement in export growth in ULI and LI industries.

Table 3.1 further reveals that the composition of manufacturing exports is even more capital and resource-intensive than the composition of real output. To illustrate, in 2016 UCI and CI industries constituted 55% of total output, while the combined share of total exports was 63%; the *motor vehicles* industry constitutes 11% of total output, while it constitutes 17%

Table 3.1 Share of Exports by Industry in 1972, 1994 & 2016

	Share of Exports by Industry (%)		
	1972	**1994**	**2016**
Basic Chemicals	3.4	7.0	6.6
Beverages	0.2	1.3	2.3
Coke and Petroleum Products	1.0	0.6	2.3
Non-Ferrous Metals	13.8	9.2	6.2
Other Chemicals	3.6	5.2	6.8
Motor Vehicles	1.1	3.5	16.8
Basic Iron and Steel	20.7	26.6	16.5
Glass	0.4	0.4	0.4
Non-Metallic Minerals	1.9	0.9	1.1
Paper and Paper Products	5.1	7.0	3.5
Tobacco	0.0	0.4	0.4
Food	20.7	6.4	7.5
Other Transport Equipment	0.3	1.1	1.3
Other Manufacturing	6.3	3.6	2.6
Printing and Publishing	0.0	0.2	0.3
Rubber	0.4	1.0	1.1
Electrical Machinery	0.8	1.5	1.5
Machinery	8.6	6.9	11.7
Metal Products	2.4	3.6	5.0
Plastics	0.1	0.3	0.6
Professional and Scientific Equipment	1.7	1.4	0.9
TV, Radio and Communication Equipment	0.1	0.6	0.8
Textiles	5.1	3.7	0.8
Wood	0.8	2.1	1.6
Clothing	1.0	2.1	0.7
Footwear	0.4	0.6	0.1
Furniture	0.0	1.8	0.5
Leather and Leather Products	0.3	1.1	0.5

Source: Department of Trade and Industry
Author's Own Calculations

of total exports; the *basic iron and steel*; *non-ferrous metals; coke* and *petroleum products* and *basic chemicals* industries hold a combined share of 25% of total output, while constituting 32% of total exports. Consequently, the growth in exports of manufactured goods has not resulted in the kinds of employment generation anticipated by the numerous policy decisions that State employment as central objective of outward-oriented growth (Black *et al.,* 2017:3-4; DTI, 2007:10-12.

Consider *Table 3.2* which details the number of employees required to produce R1million of output in 1994 and 2016 respectively, as well as the export shares of the different industries listed and the average export elasticity of employment (AEEE) for the periods 1992 to 1994 and 1995 to 2016[5]. The data present a useful means of understanding the employment effects of South Africa's current manufacturing export structure. For example, it is clear from *Table 3.2* that in a majority of industries in 2016, fewer employees were required to produce R1million of output than in 1994. Thus, any growth in demand derived from an export stimulus, would have less positive impact on employment. Additionally, the industries that have shown the most success in terms of boosting demand on the back of export-intensification, are also the industries that are the least labour-absorbing. Consequently, the positive output effects derived from trade liberalization have been in industries that require the fewest number of employees to satisfy any increase in production. For example, an exogenous positive shock in export demand of R1million for *motor vehicles* would require only 0.7 employees to produce the required output. In contrast, an exogenous positive shock in export demand for *clothing*, where the share of exports has diminished, would require 2.6 employees to produce this output. Thus, a combination of decreasing labour-intensity within industries, as well as the growing share of exports in low labour-absorbing industries, has meant that the outward-oriented growth strategy post-1994 has been even less labour-intensive than aggregate production in general.

[5]The author calculated elasticities of employment using a log-linear regression, similar to the approach adopted by Ali, Ghazi and Msadfa [Ali *et al*] (2017). The author uses these elasticities more as an accounting measure to identify associated employment trends for a given growth in exports, rather than a robust estimate of the true elasticity.

Table 3.2 Share of Exports vs. Employees per R1million by Industry & the Average Export Elasticity of Employment for SA Manufacturing in 1994 and 2016

	1994		2016	
	Employees Per R1-million of Output	Share of Exports (%)	Employees Per R1-million of Output	Share of Exports (%)
Basic Chemicals	0.9	7.0	0.3	6.6
Beverages	1.1	1.3	0.6	2.3
Coke and Petroleum Products	0.4	0.6	0.2	2.3
Non-Ferrous Metals	1.5	9.2	0.5	6.2
Other Chemicals	0.8	5.2	0.5	6.8
Motor Vehicles	2.0	3.5	0.7	16.8
Basic Iron and Steel	1.4	26.6	0.6	16.5
Glass	2.9	0.4	0.8	0.4
Non-Metallic Minerals	4.1	0.9	0.6	1.1
Paper and Paper Products	1.1	7.0	0.7	3.5
Tobacco	0.6	0.4	0.5	0.4
Food	1.8	6.4	0.9	7.5
Other Transport Equipment	2.8	1.1	1.1	1.3
Other Manufacturing	1.8	3.6	0.8	2.6
Printing and Publishing	2.0	0.2	1.5	0.3
Rubber	2.1	2.0	0.8	1.0
Electrical Machinery	2.2	1.5	1.1	1.5
Machinery	2.3	6.9	1.6	11.7
Metal Products	2.4	3.6	1.2	5.0
Plastics	2.0	0.3	1.7	0.6
Professional and Sci. Equip,	2.8	1.4	1.6	0.9
TV, Radio and Comm. Equip.	1.4	0.6	1.5	0.8
Textiles	3.9	3.7	1.5	0.8
Wood	3.0	2.1	1.2	1.6
Clothing	6.0	2.1	2.6	0.7
Footwear	4.3	0.6	1.7	0.1
Furniture	4.9	1.8	2.1	0.5
Leather and Leather Products	4.0	1.1	1.7	0.5
Export Elasticity of Employment	(1972-1994) = 0.2		(1995-2016) = -3.6	

Source: Department of Trade and Industry
Author's Own Calculations

This is underscored by the negative AEEE between 1994 and 2016, highlighting the lack of employment benefits derived from South African manufactured exports. Between 1972 and 1994, a period characterized by very little export growth or diversification, South Africa had a higher export elasticity of employment (0.21) than the period 1995 to 2016 (-3.6), a period characterized by significant export growth. Nattrass and Seekings (2019) confirm this outcome by noting that the output elasticity of employment in South African manufacturing has been negative since 1994, despite the rapid growth in manufactured exports.

3.2 Import Dominance

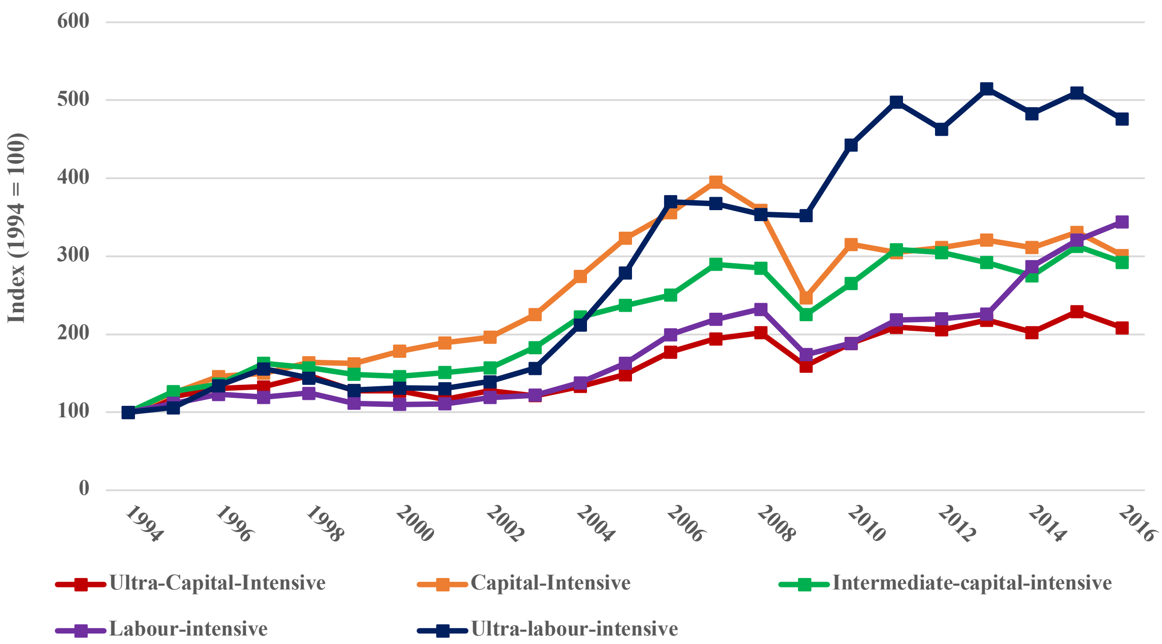
Another factor that has contributed to poor employment outcomes in South African manufacturing is the increased pressure from foreign producers supplying the domestic market. Under the highly protective and complex trade barriers *pre*-1994, LI and ULI producers in South Africa were able to supply the domestic market with little threat from foreign competition. This has changed considerably with the liberalization of trade, resulting in a significant increase in light manufactured imports since 1994. Consider *Table 3.3* which presents the import penetration ratios (IPR) for 1972, 1994 and 2016 of various manufacturing industries in South Africa[6]. Additionally, *Figure 3.1* details as an index, the growth in import volumes by factor-intensity from 1994 to 2016.

Since 1994, the level of manufacturing imports has increased dramatically. This growth, as well as the composition of these imports, has been detrimental to the employment prospects in South African manufacturing. This is confirmed by the rapid increase in import volumes and IPRs in ULI industries (*see Table 3.3 and Figure 3.1*). Significantly, the increase in IPRs in ULI industries accelerated rapidly from 2002 onwards, coinciding with the inclusion of China to the World Trade Organization (WTO) in 2001 (Edwards and Jenkins, 2015:447). By 2009, China had become South Africa's largest trading partner, with a majority of Chinese imports consisting of products from traditionally labour-absorbing industries such as the *clothing*; *textiles*, *footwear* and *furniture* industries, as well as various higher-technology *electronics* and

[6]The import penetration ratio is defined as the percentage of domestic demand that is satisfied by imports.

machinery industries (Edwards and Jenkins, 2015:450-452)[7]. This is borne out by the increase in IPRs between 1972 and 2016 of 16% to 53%; 8% to 43%; and 3% to 33% for the *clothing; footwear* and *furniture* industries respectively. In contrast, the lowest growth of Chinese imports has come in relatively capital-intensive and resource-based products such as various *chemical products*, *beverages* and *coke and petroleum* products (Edwards and Jenkins, 2015:450-452). This trend is highlighted by the comparatively low growth rate of UCI imports to South Africa (*Figure 3.1).*

Figure 3.1 Growth in Imports by Factor-Intensity



Source: Department of Trade and Industry
***Author's Own Calculations*.**

[7]For a detailed description of Chinese imports, see Edwards and Jenkins (2015).

Table 3.3 Import Penetration Ratios by Industry in 1972, 1994 & 2016.

	Import Penetration Ratios (%)		
	1972	1994	2016
Basic Chemicals	24.1	28.4	35.2
Beverages	2.9	3.2	8.4
Coke and Petroleum Products	5.8	0.8	1.7
Non-Ferrous Metals	17.8	14.0	59.4
Other Chemicals	25.8	30.8	47.4
Motor Vehicles	32.0	24.2	65.1
Basic Iron and Steel	15.7	10.6	20.0
Glass	18.9	15.3	30.3
Non-Metallic Minerals	6.9	9.0	20.2
Paper and Paper Products	17.7	14.3	22.9
Tobacco	3.9	1.6	8.3
Food	8.0	7.6	17.0
Other Transport Equipment	31.9	49.2	72.1
Other Manufacturing	15.7	11.5	28.9
Printing and Publishing	4.2	4.8	6.2
Rubber	18.7	29.0	66.8
Electrical Machinery	28.9	34.1	49.7
Machinery	49.8	62.5	92.2
Metal Products	10.2	12.7	32.4
Plastics	4.8	7.0	21.1
Professional and Sci. Equip	84.9	73.7	94.8
TV, Radio and Comm. Equip	38.2	50.8	89.4
Textiles	24.7	24.6	36.6
Wood	12.2	11.2	10.6
Clothing	16.4	8.1	58.3
Footwear	7.8	11.8	42.9
Furniture	2.9	5.0	33.3
Leather and Leather Products	26.3	40.6	46.4

Source: Department of Trade and Industry (DTI).
Author's Own Calculations

3.3 Revealed Comparative Advantage

This section examines the comparative advantage (CA) of South African manufacturing. In theoretical trade models, CA is expressed in terms of relative prices evaluated in the absence of trade. Since there is difficulty in observing these prices, it is useful to measure comparative advantage indirectly by calculating a country's revealed comparative advantage (RCA). In this paper, the Balassa RCA Index is used. This index utilizes the *observed* patterns of country and global trade in order to determine the products in which a country has a comparative advantage or disadvantage (French, 2014:2-5). Thus, the trade patterns in South African manufacturing described above can provide an indication as to where South Africa's RCA lies.

The RCA indices are calculated using the following formula:

$$RCAijt = \left\{ \frac{Xijt}{\sum Xjt} \middle| \frac{\sum Xiut}{\sum Xut} \right\}$$

Where:

- ***RCAijt*** *is the index value for* ***i*** *industry in country* ***j*** *in period* ***t****.*
- ***X ijt*** *refers to the exports from industry* ***i*** *of country* ***j*** *in period* ***t***
- ***Xiut*** *refers to world exports from industry* ***i*** *in period* ***t****.*

The index is defined as the ratio between two shares. The numerator is defined as the share of a given product in a country's export profile, while the denominator is defined as the share of a given product in world exports. A country is said to have a comparative advantage in a particular product when its RCA index value is greater than unity (*RCA>1*) and a comparative disadvantage when it is less than unity (*RCA<1*) (French, 2014:5).

At a glance, the combination of increasing capital-intensity in the export profile and the striking labour-intensity of South African imports (*see Section 3.1*) would lead one to conclude that South Africa has a comparative advantage (CA) in relatively capital and energy-intensive products, despite the large amount of surplus labour in the economy (Black *et al*., 2017:2). Implicitly, one cannot assume that CA is simply derived by initial factor endowments, but rather that it is derived from a combination of factor endowments and various industrial policies that drive the process of industrialization and the advancement of certain industries over others (Black and Hasson, 2012:3; Chang and Lin, 2009:4; Samson *et al*., 2001:6-7).

By conducting an RCA analysis, this section seeks to compare the evolution of South Africa's CA with that of various comparator countries in order to establish the extent to which South Africa has *defied* its CA by encouraging production in relatively capital and energy-intensive industries, whilst simultaneously failing to exploit its endowment of abundant labour. (Chang and Lin, 2009:4-5; Black *et al*., 2017:3). To this end, the section will first present evidence that the RCA of South African manufacturing lies, somewhat paradoxically, in UCI and CI products, despite large endowments of surplus labour. The section then presents further evidence that this evolution is in stark contrast to other emerging economies and developing countries in general. The data required for this analysis is sourced from the International Trade Center (ITC), utilizing country specific and world export data, at the three-digit Standard International Trade Classification (SITC) between 2001 and 2016. The three-digit classification is utilized for ease in categorizing various products by industry and factor-intensity.

3.3.1 <u>The RCA of South African Manufacturing</u>

Consider *Table 3.4* which presents the results from the RCA analysis conducted for 28 industries in the South African manufacturing sector. In 2001, there were twelve industries that had a RCA of greater than unity, including two ULI industries (*leather* and *furniture*); one LI industry (*wood);* one ICI industry (*food*); four CI industries (*tobacco; paper; non-metallic minerals* and *basic iron and steel*) and four UCI industries (*non-ferrous metals*; *coke and petroleum; beverages* and *basic chemicals*). By 2016, only nine industries demonstrated a RCA greater than unity, eight of which were classified as either CI or UCI and six of which encompass the MEC apparent in South Africa.

In striking contrast, South Africa has an RCA in only one LI industry (*wood*) and no (zero) RCA in any ULI industries. These outcomes confirm that the manufacturing sector remains highly dependent on CI and UCI production as a source of CA, with no CA being derived from industries that would traditionally exploit the country's surplus labour (Black *et al*., 2017:3). Instead, the RCA analysis indicates that South Africa's CA remains in energy and capital-intensive activities, reflecting a high degree of path dependence and a lack of dynamism in more labour-absorbing activities. Moreover, those industries in which RCA has improved since 2001, such as *basic chemicals, other chemicals* and *motor vehicles* are also highly capital or energy-intensive implying that this trend is not only persistent but has increased.

Despite government's *stated* objective of employment creation *post*-1994, industrial policy has in fact continued to reinforce a capital and energy-intensive development trajectory rather than alter it for the purpose of job creation and *inclusive* growth (DTI, NIPF, 2007:6, 12-15). For example, a capital depreciation allowance was granted to large-scale resource-based producers in the mid 1990's and large investment tax incentives between 2002 and 2005 were provided to capital-intensive projects in industries such as *basic iron and steel*; *non-ferrous metals* and *basic chemicals* (Black and Roberts, 2009:225; Black *et al*, 2017:22). Additionally, despite Eskom's capacity constraints, agreements were reached with Alcan in 2007 for an aluminum smelter at Coega IDZ, including a subsidized electricity price of R0.14/kWh, compared to R0.18/kWh for other industrial users and a R0.45/kWh price charged to South

Table 3.4 Revealed Comparative Advantage Index by Sub-Sector and Factor-Intensity

Revealed Comparative Advantage Index by Industry (RCA = 1)																	
Industries	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**Average**
BASIC CHEMCIALS	1.1	1.2	1.1	1.1	1.0	1.1	1.0	1.0	1.1	1.2	1.1	1.0	1.1	1.2	1.1	1.2	**1.1**
BEVERAGES	2.5	3.1	3.1	3.0	3.0	2.4	2.4	2.5	2.9	2.7	2.2	2.2	2.5	2.6	2.7	2.4	**2.7**
COKE AND PETROLEUM	1.1	1.3	1.1	1.1	1.2	1.2	1.2	0.9	0.9	0.8	0.8	1.1	1.0	1.2	1.3	1.0	**1.1**
NON-FERROUS METALS	2.2	2.7	2.3	2.9	2.3	2.2	2.0	1.9	2.1	1.6	1.4	1.4	1.6	1.5	1.4	1.6	**1.9**
OTHER CHEMICALS	0.9	0.9	0.8	0.9	0.8	0.8	0.9	0.9	1.0	1.1	1.2	1.1	1.2	1.1	1.2	1.3	**1.0**
MOTOR VEHICLES	0.9	1.1	1.0	0.9	1.0	1.0	0.9	1.4	1.5	1.5	1.4	1.5	1.5	1.5	1.6	1.4	**1.3**
BASIC IRON AND STEEL	2.9	3.4	3.7	3.6	3.2	2.7	2.7	2.7	2.8	2.8	2.1	2.2	2.2	2.4	2.2	2.4	**2.8**
GLASS	0.5	0.5	0.5	0.5	0.5	0.4	0.3	0.3	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	**0.5**
NON-METALIC MINERALS	8.1	3.2	6.7	7.1	7.3	8.1	7.8	6.0	5.0	4.3	5.6	4.1	3.7	3.7	3.4	3.5	**5.5**
PAPER	1.1	1.1	1.0	0.9	0.8	0.8	1.0	0.9	0.9	1.0	0.8	0.9	0.8	0.9	0.9	0.9	**0.9**
TOBACCO	1.6	1.2	0.9	1.2	1.5	1.6	1.2	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	**1.1**
FOOD	1.3	1.3	1.0	0.8	1.0	0.9	0.7	0.7	0.9	1.1	0.8	0.9	1.0	1.0	0.9	0.9	**0.9**
OTHER TRANSPORT EQUIPMENT	0.5	0.4	0.4	0.4	0.8	0.7	0.6	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	**0.4**
OTHER MANUFACTURING	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	**0.0**
PRINTING AND PUBLISHING	0.3	0.4	0.3	0.5	0.8	0.6	0.4	0.5	0.3	0.7	0.5	0.5	0.5	0.5	0.5	0.5	**0.5**
PROFESSIONAL EQUIPMENT	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	**0.2**
RUBBER	0.8	1.0	0.9	0.8	0.7	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	**0.7**
MACHINERY	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.6	0.6	0.6	0.7	0.8	0.8	0.9	0.8	**0.7**
ELECTRICAL EQUIPMENT	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	**0.2**
METAL PRODUCTS	0.5	0.6	0.6	0.5	0.5	0.4	0.5	0.4	0.5	0.7	0.6	0.6	0.6	0.5	0.5	0.4	**0.5**
PLASTICS	0.4	0.5	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.5	0.4	0.5	0.5	0.5	0.4	0.5	**0.4**
TV ETC,	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	**0.2**
TEXTILES	0.6	0.7	0.6	0.5	0.5	0.5	0.5	0.4	0.5	0.4	0.4	0.4	0.5	0.5	0.4	0.5	**0.5**
WOOD	1.7	2.0	1.9	1.6	1.6	1.4	1.2	1.3	1.5	1.5	1.5	1.3	1.3	1.5	1.6	1.6	**1.5**
CLOTHING	0.3	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.3	0.2	0.2	0.2	0.2	0.2	0.2	**0.2**
FOOTWEAR	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.3	**0.2**
FURNITURE	1.1	1.0	1.1	1.1	0.9	0.9	0.8	0.7	0.7	0.9	0.7	0.6	0.5	0.5	0.4	0.4	**0.8**
LEATHER	1.0	1.1	0.8	0.8	0.7	0.7	0.7	0.6	0.5	0.5	0.6	0.6	0.9	0.8	0.8	0.7	**0.7**

Source: Department of Trade and Industry (DTI).
Author's own calculations

African households (Black and Roberts, 2009:225; Black *et al.*, 2017:22). (Fortunately, this smelter was never built).

While these policies have undoubtedly had an impact on the extent to which a RCA has continued to develop in UCI and CI industries *post*-1994, they have nonetheless created very little employment in an economy where the most glaring inefficiency is the abundance of unemployed labour. As argued by Chang and Lin (2009:5) and Black and Hasson, (2012:3), if the purpose of industrial policy is to facilitate structural change in a way that ensures the most efficient use of resources, then ensuring growth in labour-absorbing industries in South Africa should be the central theme of industrial policy. Yet, while investment incentives may encourage investment by reducing the UCC, they are likely to benefit industries where the cost of capital is the significant cost component of production. Consequently, these incentives do very little to encourage a flow of investment away from capital-intensive industries into more labour-absorbing industries. Instead they have proven to encourage more investment into capital-intensive industries, proliferating a path dependence that has developed from years of industrial policy that has failed to exploit the country's surplus labour.

Diversification away from resource-based manufacturing has also been a stated objective of industrial policy since 1994 (DTI, NIPF, 2007:6). To some extent this has been successful, as exemplified by the improvement in RCA of the *motor vehicle* industry from 0.9 in 2001 to 1.5 by 2016. However, this improvement has been strongly assisted by large-scale government support. For example, the Parliamentary Budget Office (2016) reports that the *motor vehicle* industry has received 68% of all financial industrial support (in the form of various subsidies and rebate allowances) since 1994, and 82% since 2006 (Parliamentary Budget Office [PBO], 2016), much of which is accounted for by various provisions under the MIDP which was launched in 1995 (Black and Roberts, 2009:226). Thus, while the growth in the *motor vehicle* industry has enabled some degree of diversification in South African manufacturing, it has come at a significant cost to the State with little added employment benefit given the capital-intensity of motor vehicle production (*see Section 2*). In stark contrast to the State provisions for the *motor vehicle* industry, LI and ULI industries combined have received only 13% of total subsidies provided to the manufacturing sector between 2006 and 2016[8].

Although the RCA indices in *Table 3.4* may indicate a lack of competitiveness in labour-intensive production, these indices ignore the fact that government support has significantly assisted the establishment of CA in capital-intensive industries such as the *motor vehicle* and *basic and other chemicals* industries. On the one hand, this reveals that government support *did* play a significant role in developing the competitiveness (or simply RCA) in targeted industries. On the other hand, it reveals that had government support been directed at more labour-absorbing production activities, then a RCA may have been achieved in labour-intensive industries as well. Moreover, given the abundance of low-skilled labour, it's likely that achieving a RCA in labour-intensive industries would come at a lower cost to the State, with significantly larger economy-wide efficiency gains (Lin, 2009:6-7; Black and Hasson, 2012:3; Black *et al.*, 2017:3). While this submission may be contentious, what is clear is that industrial policy has continued to favour the development of capital-intensive industries, instead of emphatically supporting labour-intensive industries which better exploit the country's factor endowments.

3.3.2 Analysis of RCA in Comparator Countries

Based on the arguments put forth by Chang and Lin (2009:5-6), the authors *might* liken South Africa's industrial policy approach to one that is CA *defying* since the country fails to exploit

[8] These figures are derived from the author's own calculations from the DTI (2016), annual financial statistics database.

its vast endowment of low or semi-skilled labour. Moreover, instead of optimizing the factor endowments available, policy seeks to promote production in sub-optimal, capital and skill-intensive activities which in turn struggle to compete without significant government support (Nattrass and Seekings, 2013:7). To consider this proposition objectively *Table 3.5* below compares the evolution of South Africa's RCA with that of other developing countries that are likely to have faced similar initial factor endowments. In this context, *Table 3.5* details the RCA of China, India, Mexico and Brazil, as well as an aggregated RCA of developing economies in general between 2001 and 2016. This period after 2000 is useful to analyze as trade has liberalized since the turn of the millennium and thus it is expected that the RCA indices derived from increased trade flows are likely to more accurately reflect the true comparative CA of these countries. For brevity, these RCA indices are displayed by factor intensity, with various products classified as either UCI; CI; ICI; LI and ULI.

The table reveals the extent to which South Africa's industrialization path has differed to other developing economies. Of all of the countries included in the table, only Brazil and South Africa do not have a RCA in products manufactured in either LI or ULI industries. Brazil has a RCA in ICI products, while South Africa's only RCA is in CI and UCI products. Moreover, when comparing South Africa's RCA to an average of developing market economies, it's clear that South Africa's advantage differs markedly. Developing economies on average demonstrated an RCA in LI and ULI products with no RCA in either CI or UCI industries, while South Africa has a RC disadvantage in both the LI and ULI product categories with a notable RCA in CI and UCI alike.

Table 3.5 highlights that countries such as India, which has a RCA in UCI, CI and ULI products and Mexico, which has a RCA in CI and LI products have promoted production in more capital-intensive industries whilst simultaneously promoting production growth in industries that also provide significant employment. For example, Mexico's largest

Table 3.5 Revealed Comparative Advantage of Comparator Countries & Developing Country Average

	Revealed Comparative Advantage Index (RCA = 1)															
South Africa	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Ultra-Capital-Intensive	1.2	1.3	1.1	1.1	1.1	1.2	1.3	1.1	1.4	1.4	1.3	1.5	1.4	1.3	1.3	1.3
Capital-Intensive	2.4	1.9	2.4	2.5	2.5	2.6	2.5	2.5	2.5	2.3	2.5	2.3	2.2	2.2	2.1	2.2
Intermediate Capital-Intensive	0.4	0.5	0.4	0.4	0.5	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Labour-Intensive	0.4	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.5	0.4	0.5	0.4	0.4
Ultra-Labour-Intensive	0.6	0.7	0.6	0.5	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3
India	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Ultra-Capital-Intensive	0.8	0.8	0.8	0.9	0.9	1.1	1.1	1.1	0.9	1.1	1.0	1.1	1.2	1.2	1.2	1.2
Capital-Intensive	1.5	1.6	1.7	1.7	1.8	1.6	1.5	1.5	1.8	1.7	1.5	1.5	1.3	1.4	1.4	1.5
Intermediate Capital-Intensive	0.6	0.5	0.6	0.6	0.5	0.6	0.7	0.8	0.6	0.7	0.8	0.8	0.7	0.8	0.7	0.7
Labour-Intensive	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Ultra-Labour-Intensive	3.0	2.8	2.6	2.5	2.5	2.3	2.1	2.0	1.9	1.6	1.6	1.6	1.6	1.6	1.8	1.8
Mexico	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Ultra-Capital-Intensive	0.6	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.6	0.6	0.6	0.5	0.5
Capital-Intensive	1.2	1.2	1.2	1.1	1.1	1.2	1.1	1.2	1.3	1.4	1.4	1.5	1.5	1.5	1.6	1.5
Intermediate Capital-Intensive	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7
Labour-Intensive	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.3	1.4	1.3	1.3	1.3	1.3
Ultra-Labour-Intensive	1.4	1.3	1.3	1.3	1.2	1.0	0.9	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7
China	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Ultra-Capital-Intensive	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4
Capital-Intensive	0.5	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.5	0.6	0.6	0.7	0.6	0.7	0.7	0.6
Intermediate Capital-Intensive	0.8	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.8	0.7	0.7	0.7
Labour-Intensive	1.2	1.3	1.4	1.5	1.5	1.5	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.6	1.6	1.6
Ultra-Labour-Intensive	3.8	3.6	3.4	3.3	3.2	3.3	3.2	3.3	3.2	3.2	3.3	3.3	3.2	3.0	2.8	2.7
Brazil	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Ultra-Capital-Intensive	0.5	0.6	0.6	0.5	0.5	0.6	0.7	0.7	0.7	0.7	0.6	0.7	0.6	0.7	0.7	0.6
Capital-Intensive	1.4	1.4	1.4	1.4	1.6	1.5	1.5	1.5	1.5	1.7	1.7	1.5	1.5	1.4	1.3	1.3
Intermediate Capital-Intensive	2.4	2.3	2.1	2.2	1.9	1.9	2.0	2.1	2.1	2.0	2.0	2.1	2.5	2.3	2.3	2.4
Labour-Intensive	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.5
Ultra-Labour-Intensive	1.0	1.0	0.9	0.9	0.8	0.8	0.7	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4
Developing Countries	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Ultra-Capital-Intensive	0.9	0.9	0.8	0.9	0.8	0.9	0.8	0.7	0.7	0.8	0.9	0.9	0.8	0.8	0.8	0.9
Capital-Intensive	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Intermediate Capital-Intensive	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.7
Labour-Intensive	0.9	1.0	1.0	1.0	1.0	1.0	1.0	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1
Ultra-Labour-Intensive	1.7	1.7	1.7	1.6	1.5	1.5	1.5	1.4	1.5	1.4	1.4	1.4	1.4	1.3	1.4	1.4

Source: International Trade Centre (ITC) 2018.
Author's Own Calculations

manufactured export in 2016 were *motor vehicles* ($101 billion worth of exports), but it also exported $82 billion worth of *electrical machinery* and various parts thereof (International Trade Centre [ITC], 2018). Similarly, India's largest manufacturing exports in 2016 were *motor vehicles* ($16.6 billion), but it also exported $16 billion worth of machinery and $8.8 billion worth in *clothing and apparel* (ITC, 2018). In striking contrast, South Africa exported $9.7 billion worth of *motor vehicles* and $8.7 billion worth of *iron and steel* products, while the largest labour-intensive export was *machinery* at $1.8billion (ITC, 2018).

SECTION 4: - The Relative Competitiveness of Unit Labour Costs in South African Labour-Intensive Manufacturing

Wages in South Africa remain a highly contentious issue, with several commentators citing relatively high wages as a primary reason for the lack of competitiveness in labour-intensive manufacturing industries (Edwards and Golub, 2004:6; Rankin, 2016:24-25; Natrrass, 2014:21; Nattrass and Seekings, 2013:7 and 2019; DTI, 2010:28). The preceding three sections highlighted the role that industrial policy has played in distorting South Africa's CA away from labour-intensive production. This section seeks to explore the legitimacy of claims that relatively high wages in South Africa remain the critical constraint to labour-intensive manufacturing growth and implicitly, a CA in labour-intensive production. In order to do so, South African unit labour costs (ULC), as a measure of labour cost competitiveness, are compared to ULC of selected comparator countries to determine the relative cost competitiveness of labour in South African manufacturing. The analysis compares ULC in production of seven selected labour-intensive product categories to determine the extent to which ULC in South Africa are competitive to the comparator countries.

4.1 ULC as a Measure of International Cost Competitiveness

This section examines the credibility and effectiveness of ULC as a measure of international competitiveness, drawing on previous studies conducted by Golub (1994); Golub and Heish (2000); Edwards and Golub (2004); Matswalela and Van Zyl (2016); De Broeck, Guscina and Mehres [De Broeck *et al.*], 2012:5 and the DTI, (2010).

ULC can be defined as the ratio of wages (or labour compensation (LC)) and labour productivity (LP), which is derived from the following formula:

$$ULCi_j = {LCi_j}/{LPi_j}$$

Where

- ULC_{ij} *refers to the unit labour cost of industry i in period j.*
- LC_{ij} *refers to the labour compensation of industry i in period j.*
- LP_{ij} *refers to the labour productivity in industry i in period j.*

The formula illustrates how an increase in LC greater than the increase in LP will result in an increase in ULC. Conversely, an increase in LP greater than the increase in LC will result in a reduction in ULC[9]. Implicitly, the argument that lower foreign wage rates can hurt domestic industries doesn't depict the full story. What matters is the level of wages relative to productivity. In countries that demonstrate low levels of labour productivity, rapidly rising wages can have negative impacts on long-term profitability (Felipe and Kumar, 2010:2). Conversely, rising wages can also be offset by rising productivity levels and can thus be compatible with long-term profitability.

Thus, ULC have often been used as a means of measuring the relative competitiveness of countries, sectors or firms. The usefulness of this approach is enhanced when the link between ULC and prices is strong (De Broek, *et al*: 2012:5; Felipe and Kumar, 2010:3). For example, when labour compensation constitutes a major component of production costs, ULC will strongly influence prices. Conversely, where production is more capital-intensive, ULC are likely to be less effective as a measure of cost competitiveness as prices are likely to be determined by other production factors such as the ownership and use of various technologies encompassed in the production process or access to capital equipment. However, given that the

[9] ULC growth is equal to the growth in labour compensation minus the growth in labour productivity (De Broeck *et al*., 2015:5)

focus of this analysis remains solely on labour-intensive products, where labour constitutes a significant portion of production costs, the link between labour costs and price competitiveness is assumed to be strong. The implication is that firms in countries with higher ULC are likely to be less price competitive than firms operating in countries where ULC are lower.

De Broek *et al*. (2012:4) notes that the link between ULC and prices is stronger when product market competition is higher. Where competition is low, firms are price setters, with the costs of production having less influence on the level of prices. Conversely where product market competition is high, prices often reflect as much, with firms forced to keep prices low to remain competitive (De Broek *et al.,* 2012:5; Felipe and Kumar, 2010:3-4). This effect is more apparent where room for specialization and diversification is limited, which is often the case with highly labour-intensive products such as *clothing, textiles* and *footwear* (Asian Development Bank, 2015:78; Edwards and Jenkins, 2015:449). In South Africa, where trade liberalization has exposed domestic labour-intensive producers to fierce competition from foreign producers (see *Section 3*), the assumption of a highly competitive market for labour-intensive products is justified and thus it can be assumed that ULC will provide a good indication of cost competitiveness.

The ULC approach to assessing cost competitiveness is further supported when considering the changing dynamics in global production (Edwards and Golub, 2004:6). In a global economy that is increasingly characterized by the global dispersion of production, where the production process of a single product is fragmented into distinct stages, that often take place in different countries, the cost and productivity of non-tradable inputs, such as labour, have become an important determinant in the location of production (Edwards and Golub, 2004:6; Low and Tijaja, 2013:1-2). For example, the production processes encompassing the high-volume, simple assembly of various consumer electronics products, has shifted to economies in South East Asia where wages are relatively low and workers often work upwards of 60 hours a week to improve productivity levels (Edwards and Golub, 2004:6). For this reason, by considering both the productivity and cost component of labour as an input in the production process, ULC can provide an effective method of assessing the relative attractiveness of a country for foreign direct investment in labour-intensive manufacturing.

However, there are limitations to utilizing the ULC approach to assess relative competitiveness. For example, the ULC approach ignores various market access or trade agreements that allow countries to export to markets without the added cost burden of paying duties on goods (De Broek *et al*, 2012:8; Edwards and Golub, 2004:10). In these cases, ULC may not provide a thorough determinant of competitiveness in global markets. Additionally, the ULC approach to assessing competitiveness does not account for the effects of various trade protection policies, government assistance or subsidies. These factors may similarly artificially enhance a country's cost competitiveness despite prevailing levels of ULC.

4.2 Relative ULC Analysis in Labour-Intensive Manufacturing

In order to determine the relative competitiveness of labour costs in South African manufacturing, this section provides a comparative analysis of South African ULC in the production of seven labour-intensive product categories against the ULC of 20 comparator countries. The comparator countries are Brazil; Bulgaria; China; Egypt; Ethiopia; Hungary; India; Indonesia; Malaysia; Mauritius; Mexico; Philippines; Poland; Portugal; Romania; Russia; Singapore; Spain; Turkey and Vietnam, while the seven labour-intensive product categories consist of *textiles; clothing; footwear; rubber products; plastics; consumer electronics* and *furniture.*

Country and product category level data is sourced from the United Nations Industrial Development Organization's (UNIDO) *Industrial Statistics* database at a 3- and 4-digit ISIC level. The UNIDO database provides data on real output (expressed in US$), total wage bill (expressed in US$), the number of firms and the number of employees for each country and product category. The data for these variables is utilized to construct the two key variable components for ULC, namely per employee LP and the average real wage per employee or LC[10]. Using the constructed ULC variable for each country, a relative ULC index is derived, such that the ULC in each country is compared to the sample average for a given product category in a given year. An index value of unity implies that a country's ULC is equal to that of the sample average, while an index value less than unity implies that a country's ULC are more competitive than the sample average for a given product in a given year and vice-versa[11].

Table 4.1 presents the relative ULC index values for 21 countries (including South Africa) for the seven product categories in question for the year 2000 and 2015 respectively. This allows for both the absolute level of ULC in each country to be assessed against the sample average for the two years under review, as well as for the change in a country's respective ULC to be compared relative to the sample average over time (Edwards and Golub, 2004). If a country's ULC index value is lower in 2015 than it was in 2000 then this implies that ULC in that country have become more competitive relative to the sample average over time. Additionally, as noted by Van Ark, Stuivenvold and Ypma [Van Ark *et al*] (2005:4), in order to acquire a full understanding of differences in relative ULC competitiveness across countries, it's critical to evaluate the drivers of changing ULC competitiveness as well, that is, changes in a country's relative LC and LP. To account for this, *Tables 4.2* and *4.3* present the LC index values and LP index values for the seven product categories and comparator countries under

[10] Per employee LP is calculated as a ratio of total output and total employees, while per employee LC is calculated as total wages divided by total employees.

[11] Note that where product data is not available, the index value is left blank for that country.

review[12]. The tables reveal that for the most part, a country's relative competitiveness in terms of ULC differs significantly across different product categories, highlighting the importance of using disaggregated ULC data when comparing ULC across countries. In addition, the components of ULC (that drive changes in competitiveness over time) also differ significantly between countries and product categories.

In the year 2000, South African ULC were more competitive relative to the sample average in only two of the seven product categories, namely *textiles* and *footwear*. By the year 2015, South Africa had a ULC advantage over the sample average in only one of the seven product categories, namely *furniture*. The table indicates that the notion that higher wages have been the cause of the decreased competitiveness is only partially correct. Across all seven product categories the figures reveal that poor productivity levels are equally important when explaining the high ULC relative to the comparative sample. For example, the average LC in South Africa for *textiles* were in fact more competitive in 2015, relative to the sample average, than they were in 2000. However, the significantly lower relative LP in 2015 offsets this and consequently overall relative ULC competitiveness was reduced. Whereas, the high relative LP in Turkey meant that despite having higher average LC than the sample average, ULC were more competitive than the sample average in a majority of product categories in 2015.

*Table 4.*1 suggests that in contrast to South Africa, by 2015, countries such as China, India and Vietnam demonstrated a ULC advantage over the sample average in all seven product categories, reaffirming the common theoretical and empirical proposition that these economies have generally benefitted from lower wages and economies of scale advantages from supplying large and growing domestic and regional markets (Matswalela and Van Zyl, 2016:385; DTI,

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[12] The same mathematical interpretation of ULC index values can be applied to LC index values. However, when assessing LP index values, the opposite interpretation should be applied, such that a value greater than unity implies greater competitiveness than the sample average and vise-versa.

2010:28-29; Edwards and Jenkins, 2014:1; Nattrass and Seekings, 2013). In the case of China, *Table 4.2* and *4.3* highlight that while significantly lower relative LC in 2000 contributed to China's ULC advantage and dominance in global labour-intensive manufacturing, by 2015, the country's ULC advantage was derived by significantly higher relative LP. This is consistent with the notion that growth in Chinese LP has contributed significantly to the country's dominance in global manufacturing over the past two decades, despite consistent increases in wages (Nofri, 2015; Su and Heshmati, 2011:4-5; Kaplan, 2016).

Similarly, while low relative LC in 2015 contributed to Vietnam's relative ULC advantage (*see Table 4.3*), improvements in relative LP are largely responsible for the improvement in relative ULC competitiveness for all seven product categories. These results underpin the rapid growth in manufacturing in the country over the past decade, particularly in high-volume, labour-intensive production (Eckardt, Mishra and Tuan Dinh, 2018).

The importance of improving LP is further underscored when considering countries from a similar macroeconomic disposition to South Africa, such as Brazil and Mexico. For example, *Table 4.1* suggests that in 2000, ULC in Brazil were more competitive than the sample average in six of the seven product categories but by 2015, ULC were less competitive than the sample average in all seven of the product categories. *Table 4.2* and *4.*3 suggest that in all seven product categories, relative LC changed only marginally between 2000 and 2015, while relative LP in 2015 was far less competitive than in 2000. This result is similar in the Mexican case.

4.3 ULC and International Competitiveness

The results presented above seem to dispel the common view that South African wages are the primary reason for the poor performance of labour-intensive production (Nattrass and Seekings, 2013; DTI, 2010:28). Instead, the results indicate a more nuanced conclusion,

Table 4.1 ULC Index For 21 Countries in 2000 and 2015

Source: UNIDO Indastat Database.
Author's own calculations

Table 4.2 Average Wage and Labour Productivity Index For 21 Countries 2010

Source: UNIDO Indastat Database.
Author's own calculations

Table 4.3 Average Wage and Labour Productivity Index For 21 Countries 2015

Source: UNIDO Indastat Database.

***Author's own calculations**

suggesting that LP relative to wages (LC) is equally important when considering the cost competitiveness of South African labour. However, in order to ascertain the extent to which this has hampered growth in South African labour-intensive industries, it is necessary to examine the relationship between ULC and competitiveness in global markets. Edwards and Golub (2004) show that the growth in South African manufactured exports in the 1990's (*see Sections 1 and* 3) was driven, in conjunction with the rapid liberalization of trade, by a steady decline in ULC. However, as shown in the analysis above, relative South African ULC in labour-intensive production have not improved since 2000, coinciding with stagnant output growth, low exports and high import penetration in these product categories (*see Sections 2 and 3*).

In order to understand the extent to which uncompetitive ULC have impacted on growth in South African labour-intensive manufacturing, this section employs a simple econometric model to establish the empirical relationship between ULC and export performance, supplemented by country-specific examples in order to achieve a more nuanced understanding of the relationship. Export performance is used in this case as a means of determining the relative competitiveness in global markets of a country's products for a prevailing level of ULC. The methodology adopted in this analysis draws on the work of Edwards and Golub (2004); Ali *et al.* (2017) and De Broeck *et al* (2012), where the authors seek to empirically test the relationship of ULC on export performance, both in terms of export value as well as the share of global exports.

The ULC elasticities for export value (expressed in US$), as well as the share of world exports (expressed as percentage of global exports) for a given product category can be defined by the equations 1 and 2 below:

Equation 1. $$\boldsymbol{lnExp}.it = \boldsymbol{\beta}0 + \boldsymbol{\beta}1\boldsymbol{lnULC}it + \boldsymbol{\varepsilon}it$$

Equation 2. $$\boldsymbol{lnExpShr}.it = \boldsymbol{\beta}0 + \boldsymbol{\beta}1\boldsymbol{lnULC}it + \boldsymbol{\varepsilon}it$$

Where:

- ***lnExp.it*** *is the log of exports of country i in time t.*
- ***lnExpShr.it*** *is the log of export share of country i in time t*
- ***lnULCit*** *is the log of ULC in country i in time t.*
- $\boldsymbol{\varepsilon it}$ *is the idiosyncratic error term.*

Equations 1 and 2 are applied to seven separate panel datasets for each of the product categories examined in the previous section, with data collected over the period 2000 to 2015. ULC data is derived from the UNIDO Indastat database, while country and global product-specific export data is sourced from the ITC database at the 2-digit ISIC level. Equations 1 and 2 allow for simple point-elasticity estimates to be derived using a log-linear regression of the log of ULC on the logged value of exports and the logged value of export share respectively[13]. By utilizing the fixed-effects models defined by Equations 1 and 2, the analysis can account for inter-country differences such as size and geographic location, each of which may impact on export performance. While the size of the sample in the panel data sets allow for a degree of robustness in these estimation results, the elasticities derived from this equation should be viewed more as a simple elasticity measurement of the relationship between ULC and export performance rather than a robust statistical estimation (Ali *et al.*, 2017:12).

Table 4.4 below presents the estimated ULC point-elasticity of exports for each product category. These elasticities represent the sample average elasticity among the comparator

[13] Export shares have been normalized to one hundred to allow for positive logged values.

countries over the 15-year period reviewed[14]. With the exception of the *plastics* product category, the elasticities are statistically significant at either the 1%, 5% or 10% levels. As expected, *Table 4.4* further reveals that in all product categories excluding *plastics*, the elasticity is less than zero, implying a negative relationship between the level of ULC and the value of exports *ceteris paribus*, such that a decrease in ULC is associated with an increase in the value of exports and vise-versa.

The magnitude of this relationship is greatest in the *clothing* product category, where a 1% decrease in the sample average ULC is associated with a 0.34% sample average increase in the value of exports. The *textiles* product category exhibits a weaker elasticity than the *clothing* product category, with a 1% average decrease in ULC associated with a 0.19% average increase in export value. In the *footwear* and *furniture* product categories, a 1% average decrease in ULC is associated with a 0.20% and 0.23% average increase in export value respectively. In the *rubber* and *consumer electronics* product categories a 1% average decrease in ULC is associated with a 0.17% and 0.18% average increase in export value respectively.

The *plastics* product category demonstrates a weak relationship between ULC and export value, implying that in the sample countries, labour costs are not necessarily a primary source of competitiveness in global export markets for these products. These findings tentatively confirm that on average, the more labour-intensive the production process for a product is, the greater the impact that ULC will have on the ability to compete in global markets. Countries in the sample that have been able to reduce ULC for a given product – or maintain ULC at levels lower than competitors – have been able to increase their respective export values for

[14] An elasticity equal to one implies that for a 1% increase in ULC, the value of exports will increase by 1%. An elasticity equal to negative one implies that a 1% increase in ULC will result in a 1% decrease in the value of exports.

Table 4.4 ULC Elasticity of Exports for Selected Product Categories

Product Category	Elasticity	R^2
Textiles	**-0.19**** *-0.07*	**0.36**
Clothing	**-0.34***** *-0.09*	**0.28**
Footwear	**-0.20***** *-0.07*	**0.4**
Rubber	**-0.17***** *-0.07*	**0.29**
Plastics	**0.01** *-0.06*	**0.29**
Consumer Electronics	**-0.18*** *-0.13*	**0.4**
Furniture	**-0.23**** *-0.09*	**0.29**

Source: UNIDO Indastat Database.
Author's own calculations

Note:

- The dependent variable is the log of real exports.
- Standard errors are in parentheses below the estimated elaticities.
- ***, **, * indicates statistical significance at the 1%, 5% and 10% levels, respectively.

these products.

Table 4.5 below presents the estimated ULC point-elasticity of global export share for each product category, with all estimated elasticities significant at either 1%, 5% or 10% levels. These elasticities represent the sample average elasticity among the comparator countries over the 15-year period reviewed (2000 and 2015). Unsurprisingly, *Table 4.5* also suggests a negative relationship between ULC and the share of global exports for all product categories, such that a reduction in ULC across the sample countries is associated with an average increase in the share of global exports. For the t*extiles, clothing* and *footwear* product categories, a 1% average decrease in ULC is associated with a 0.18%, 0.19% and 0.21% improvement on average in the share of global exports. Similar results are estimated for the *rubber*, *plastics*, *consumer electronics* and *furniture* product categories, albeit to a lesser degree. A 1% average decrease in ULC for the *rubber*, *plastics*, *consumer electronics* and *furniture* product categories is associated with a 0.14%, 0.06%, 0.20% and 0.29% average improvement in a country's export share respectively.

The results estimated in *Table 4.4* and *4.5* are consistent with those cited in De Broeck *et al*. (2012), where the authors note that countries which have demonstrated improvements in (or declining) ULC relative to an international norm are those that have increased their respective share of global exports the most. The implications of these results for South Africa are significant given the country's continued intention to embark on an export-intensive growth strategy. Given South Africa's lack of relative ULC competitiveness, if such a strategy is to be supported by growth in labour-intensive exports, such that employment is a direct outcome of export-intensive growth, then it follows that ULC would be an important consideration for policy makers.

4.4 Discussion and Conclusion

The evidence presented in this section suggests that while wages are an important determinant of labour cost competitiveness, LP is an equally important consideration when seeking to understand relative cost competitiveness of labour across countries. The results in *Section 4.2* suggest that in 2015, ULC in South African labour-intensive production were relatively less competitive than the sample average (with the exception of ULC in *furniture* production). Given the negative relationship between ULC and export performance, as demonstrated by the point-elasticity estimates in *Section 4.3*, one can suggest that relatively uncompetitive ULC in labour-intensive manufacturing have contributed to the lack of export growth in these industries, as well as the rapid growth in import penetration ratios for these products (*see Section 3*).

Table 4.5 ULC Elasticity of Global Export Share for Selected Product Categories

Product Category	Elasticity	R^2
Textiles	**-0.10*** *(0.05)*	**0.15**
Clothing	**-0.12**** *(0.67)*	**0.12**
Footwear	**-0.09***** *(0.07)*	**0.09**
Rubber	**-0.05**** *(0.06)*	**0.11**
Plastics	**-0.10**** *(0.10)*	**0.08**
Consumer Electronics	**-0.14**** *(0.10)*	**0.13**
Furniture	**-0.09*** *(0.17)*	**0.15**

Source: UNIDO Indastat Database.
Author's own calculations

Note:

- The dependent variable is the log of real exports.
- Standard errors are in parentheses below the estimated elaticities.
- ***, **, * indicates statistical significance at the 1%, 5% and 10% levels, respectively.

Therefore, the common notion that lower wages alone will improve the competitiveness of South African labour-intensive production is an oversimplification of the problem. Countries that face similar macroeconomic conditions to South Africa such as Turkey, have been able to improve the relative competitiveness of ULC despite employers being burdened by relatively higher per employee LC than employers in South Africa (*see Table 4.2 and 4.3*). This has been achieved through improvements in relative LP rather than reductions in relative LC. Consequently, while maintaining wages at competitive levels going forward is likely to remain an important feature of industrial policy decisions aimed at improving growth and export prospects in employment generating industries, it's likely that South Africa's competitive edge will have to be derived through improvements in relative productivity levels as well.

SECTION 5 - Conclusions and Policy Recommendations: Is there a Role for Special Economic Zones?

5.1 Introductory Discussion

The evidence presented in the preceding sections of this paper has highlighted how South Africa's industrial development has followed a path of capital and energy dependence, in defiance of its endowment of abundant labour. This growth in capital and energy-intensive production and exports in South Africa is evidence of the fact that purposeful and strategic policy support can effectively develop a competitive advantage in industries. However, as noted by Justin Lin in Lin and Chang (2009:5), the cost of achieving a competitive advantage will likely be greater when this development defies a country's *natural* comparative advantage. Thus, if the purpose of industrial policy is to facilitate structural change in a way that ensures the most efficient use of a country's resources, then targeting high-skilled, capital-intensive manufacturing industries in South Africa, despite a surplus of low-skilled labour, is implicitly cost-ineffective and purpose-defying.

In principle, formal policy as an institution under the direct authoritative supervision of the State can effect immediate change in society. However, these formal institutions are deeply intertwined with the informal institutions that reflect the prevailing political, social and economic interests within that society and consequently, formal policy change is never a smooth process, but rather sticky and path dependent, with policy outcomes reflecting a compromise between various role players in the economy. (Aggarwal, 2017:11).

It follows therefore that South Africa's capital and skill-intensive path dependence cannot simply be altered by means of policies that favour labour-intensive growth over the current development trajectory, despite this trajectory impeding broader developmental objectives such as large-scale job-creation. Special Economic Zones (SEZ), if implemented effectively, provide a policy tool to address these institutional inefficiencies, enabling policy implementation that is more aligned to the developmental goals in an economy (Aggarwal, 2012:1). In this sense they provide a potential solution to create an environment that removes the impediments to the broader development objectives of a particular country (The World Investment Report, 2019:131; Aggarwal, 2017:12).

With the above in mind, this section explores the practical foundations of SEZ's as the cornerstone of an industrial policy approach that explicitly supports investment and growth in manufacturing industries that offer the greatest potential for job-creation. The arguement for a labour-intensive manufacturing SEZ in South Africa is derived from recommendations published in the Centre for Development and Enterprise's (CDE) seven-part series entitled "The Growth Agenda". The practical foundations of the CDE's proposal suggest the establishment of a labour-intensive export processing zone (EPZ) in Nelson Mandela Bay, with all production inside the zone destined for the export market (Kaplan 2016:5). Kaplan argues that the single greatest impediment to labour-intensive growth in South Africa is the relatively high bargaining council mandated minimum wages firms are forced to pay (Kaplan 2016:2-5). As such, the main incentive proposed to attract investment into the zone is the elimination of various labour regulations governing firms operating inside the zone, allowing free market forces to determine the equilibrium wage paid to employees, rather than being obligated to pay mandated minimum wages.

Drawing on Kaplan's EPZ proposal as a basis, and on the principal that an SEZ in some form may provide an effective solution to stimulate investment and growth in labour-intensive industries, the remainder of this paper argues a broader strategic approach, whereby lower wages is not the only determinant necessary to ensure the long-term sustainability of an SEZ (ILO:2014)

Such an approach would seek to develop a sustainable competitive advantage in labour-intensive manufacturing, utilizing the country's endowment of low-skilled labour, and generating the positive externalities associated with improved employment outcomes. To this end, the remainder of this section is set out as follows: *Section 5.2* examines the utilization of SEZs as drivers of job-creation, reflecting on South Africa's current SEZ policy in the process; *Section 5.3* presents the arguments for a labour-intensive SEZ policy in South Africa and *Section 5.4* grounds the argument by presenting a practical example that examines the financial implications of such an approach, utilizing the *clothing* industry as a case study.

5.2 SEZs as Drivers of Job-creation

Simplistically, SEZs are defined as legally and geographically designated areas in which some combination of infrastructural, fiscal or regulatory incentives are offered to firms operating within the designated jurisdiction (Centre for Development and Enterprise [CDE], 2012; Saggers, 2015:8). SEZs have traditionally been established as economic *enclaves*, legally segmented from the broader economy as a means of overcoming various regulatory and institutional impediments preventing certain developmental objectives (Aggarwal, 2017:10; World Investment Report, 2019:128). In this regard, SEZs have been deployed around the world to achieve a variety of differing objectives, including but not limited to trade promotion, foreign direct investment (FDI), industrial development and job-creation (Aggarwal, 2017:2-3; Asian Development Bank, 2015:68; World Investment Report, 2019:128-129).

Numerous successes, most notably in Asia, demonstrate the potential for effective SEZ programmes to catalyze economic development and generate large-scale employment, both inside the SEZs themselves, as well as in the broader economy. For example, SEZs in Vietnam are credited with the creation of over 1 million direct and indirect jobs in the first 15 years of operation; Bangladesh's SEZ programme is said to have created over 300 thousand jobs since

1983; and SEZs in China are said to have generated roughly 40 million direct jobs since their inception (Asian Development Bank, 2015:67-69; Farole and Sharpe, 2017:15).

In terms of employment, South Africa's SEZs have been expensive and underwhelming. *Table 5.1* below details the employment outcomes in two of South Africa's largest and oldest SEZs, namely Coega IDZ (CIDZ) and East London IDZ (ELIDZ). Between 2001 and 2015, CIDZ attracted a total of R11.6-billion[15] in private sector investment, with only 6860 permanent jobs generated over the same time. This equates to approximately R1.7 million in investment per permanent job created. Similarly, between 2001 and 2015, ELIDZ received R2.5 billion in investment and generated 3048 direct jobs, equating to a R820 210 investment for every permanent job created. *Table 5.1* further highlights that job-creation in the zones is also skill-intensive, with only 34% of permanent jobs in CIDZ classified as either low or semi-skilled, with this figure marginally higher at 36% in ELIDZ. This equates to roughly R5million investment per low/semi-skilled job created at CIDZ and R2.3million investment at ELIDZ. The outcomes highlighted in *Table 5.1* can be explained in part by the dominant production activities occurring inside the SEZs, detailed in *Table 5.2*. With the exception of agro-processing which is relatively labour-intensive, the primary manufacturing activities occurring inside of South Africa's SEZs include *chemical, metals* and *motor vehicle* production, all of which are capital and skills-intensive.

As highlighted by Kaplan (2016:1-4), South Africa has not had an SEZ where job-creation is the central focus but instead SEZ policy has focused on developing higher value-adding and skill-intensive activities, much in line with the development objectives spelt out in other central policy documents (Farole and Sharpe, 2017:15; Kaplan, (2016:7).

[15] Investment totals are quoted in 2015 Rands.

Table 5.1: Employment Outcomes in Coega IDZ and East London IDZ

CIDZ and ELIDZ (2015)					
IDZ	**Primary Production Activities**	**Investment**	**Permanent Employees**	**%Semi or Low-Skilled**	**Investment per Employee**
Coega (CIDZ)	Agro-processing	R11.6 billion	6860	34%	R1.7 million
	Motor Vehicles				
	Energy				
	Metals				
East London (ELIDZ)	Motor Vehicles	R2.5 billion	3048	36%	R820 210
	Agro-processing				

Source: South African Industrial Development Zone [SAIDZ] Survey (2015); East London Industrial Development Zone Survey [ELIDZ] (2015).

Table 5.2: Primary Manufacturing Activities in South African SEZs

SEZ	Major Production Activities
Coega IDZ	Chemical; Metals; Motor Vehicles and Components; Energy; Agro-processing
East London IDZ	Motor Vehicles and Components; Agro-processing; Metals; Energy
Richards Bay IDZ	Metals
Saldanha Bay IDZ	Metals; Chemicals; Other Transport Equipment
Maluti-A-Phofung SEZ	Newly established – Targets medium and heavy manufacturing; Agro-processing
OR Tambo IDZ	Metals; Non-metalic Minerals; Capital Equipment; Energy
Musina/Makhado IDZ	Metals

Sources: Chinguno, 2011; DTI, 2019; Coega Development Corporation [CDC], 2019; Richards Bay Industrial Development Zone [RBIDZ], 2019; East London Industrial Development Zone [ELIDZ], 2019; Gauteng Growth and Development Agency, 2019.

Consequently, the rationale and critical success factors for South Africa's SEZ programme are not conducive to large-scale job-creation because the overriding objective of the policy is focused on supporting rather than altering the current development trajectory. Simply put, the SEZ programme in its current form is not likely to overcome the impediments preventing South Africa from moving to a more labour-intensive growth path.

5.3 The Arguments for A Labour-Intensive SEZ Policy in South Africa

As noted by Aggarwal (2017:14), the primary objective of an SEZ policy should be to overcome the sticky and path dependent institutional impediments that inhibit desired developmental outcomes from occurring organically in the broader economy. However, there is no blueprint of a successful SEZ (Aggarwal, 2013:13). Parallel to the successes described previously, exist a plethora of SEZ programmes around the world that remain significantly under-utilized, with limited investment and job-creation (Aggarwal, 2017:2; Asian Development Bank, 2015:67-69; Mukherjee, Pal, Deb, Ray, Goyal [Mukherjee *et al*], 2016:34-40; World Investment Report, 2019:129). Despite the fact that their impact on development outcomes remains highly contentious given the mixed results and experiences between countries (Aggarwal, 2017:2; World Investment Report, 2019:129), evidence suggests that there are key elements that are essential to long-term sustainability and success namely, strategic focus, regulatory framework and value to investors (World Investment Report, 2019:131). With, these considerations in mind, the following section presents the argument for a labour-intensive SEZ policy in South Africa.

5.3.1 SEZ Infrastructure is Already Developed

In cases where SEZs are designed to promote trade and access to global markets, upfront costs are often associated with large-scale investments in trade infrastructure such as seaports or airports. This was no different with SEZ implementation in South Africa, with the DTI expending R3.3 billion and R1.1 billion on infrastructural development and upgrading at CIDZ and ELIDZ respectively between 2001 and 2010 (Chinguno, 2011; Scheepers, 2012:34). Thus, perhaps the most tangible advantage to using SEZs to promote large-scale job-creation in South Africa, is that the infrastructure required to establish the policy already exists. Furthermore, current investment and activity in South Africa's SEZs remains underwhelming and much of the developed infrastructure is significantly underutilized (Kaplan, 2016:4; DTI, 2012; Parliamentary Monitoring Group [PMG], 2013; Chinguno, 2011). This has been particularly evident in the case of the CIDZ, where the R11 billion, 60-hectare deep-water port and container terminal, Ngqura, still only utilizes roughly 25%, and the nearby Port Elizabeth harbour only 56% of capacity respectively. (Ports Regulator of South Africa, 2016:7). Whereas the establishment of an SEZ policy from scratch would require significant upfront cost and bear considerably higher risk of failure, the establishment of an SEZ for labour-intensive manufacturing needn't incur the same burden (Kaplan, 2016:4). Current surplus infrastructural capacity would merely require reallocation to accommodate the needs of the newly established labour-intensive SEZ.

5.3.2 Strategically Focused Industry Targeting

If rapid job-creation is seen as a pressing strategic development objective, then SEZ's can be used not just as an investment promotion tool but as a strategic industrial policy tool designed to explicitly target and support labour-intensive manufacturing industries (PMG, 2013).

Numerous global experiences predicate that successful SEZ design and implementation occurs with specific industrial activities and value chain components in mind, with these activities well aligned to strategic development objectives in the host country (Aggarwal, 2017:16; Asian Development Bank, 2015:130-131; Farole and Sharpe, 2017:12). Through industry targeting, SEZ design and implementation can more effectively provide for, and promote the required factors of production, skills development, supply chain linkages and SEZ incentives most likely to create a source of competitive advantage to SEZ firms (World Investment Report, 2019:130).

Latecomer countries to SEZ implementation, most notably in less developed economies, have used SEZs primarily as investment promotion tools rather than strategic industrial policy tools (World Investment Report, 2019:129). In this sense, a multi-activity approach has been adopted with minimal design and implementation effort in clustering or specializing. Consequently, the scope for knowledge spillovers, cost sharing, resource pooling, productivity gains and supply chain linkage development associated with industrial clustering and economic agglomeration is severely limited (Asian Development Bank, 2015:76; World Investment Report, 2019:130).

Much in the same way, SEZs in South Africa have been used as investment promotion tools rather than a strategic industrial policy instrument to achieve developmental objectives aligned to a clear industrial strategy (PMG, 2013). For the most part South Africa's current SEZ policy has had a broad industrial focus that makes vague distinctions between firms that are or aren't eligible to invest in each SEZ. There were no feasibility studies conducted into the viability of SEZs for specific industries or value chains, nor was the private sector sufficiently consulted as to what the prevailing binding constraints were for specific industries (PMG, 2013). For example, current and potential investors surveyed cited skills shortages, the regulatory environment, trade services and electricity constraints as primary binding obstacles to growth. Yet despite this, the current SEZ programme emphasizes infrastructure provision and fiscal incentives as the core SEZ offering, with no clarity on how either of these focuses address the constraints cited by potential investors (PMG, 2013; Farole and Sharpe, 2017:15).

With the above in mind, there is significant scope for SEZs to be used as a strategic policy tool for rapid job-creation by establishing industry targeted SEZs that are designed and implemented to provide a competitive advantage to specific labour-intensive activities. For example, if the availability of skills is important to investors from the *clothing* and *textiles* industry, then a *clothing* and *textile* SEZ can make provisions to implement skills development programmes specific to the industry. At the same time, the provision of industry-specific SEZ offerings such as incentives, infrastructure and support services allows SEZ administrators a clearer strategic focus and mandate when marketing the SEZ offerings to firms, a factor which has been a considerable challenge of the current SEZ policy where no clear marketing strategy exists (Special Economic Zone Advisory Board [SEZAB], 2018:29).

5.3.3 A Testbed for Supportive Labour-intensive Policy

As discussed above, when informal institutions prevent the removal or altering of regulations in the economy that are binding constraints to the development of labour-intensive manufacturing industries, then SEZs may be an appropriate instrument through which policy can be experimentally implemented to remove these constraints. (Farole and Sharpe, 2017:15). For example, SEZs in China were used as laboratories for new policies designed to liberate the Chinese economy despite the broader economy remaining highly regulated and distorted. Only once policies were proven inside SEZs were they rolled out in the broader economy to emulate the pro-growth business environment achieved inside of the zones (Farole, 2011:196; Asian Development Bank, 2015:68).

In South Africa, the Youth Wage Subsidy (YWS) was, to an extent, an attempt to employ a similar strategy. The policy was proposed as a means of job creation and improving the cost-competitiveness of youth labour in South Africa, reducing the burden faced by employers in employing new low-earning individuals between the ages of 18 and 29 (Ebrahim, Leibbrandt and Ranchhod [Ebrahim *et al*, 2017:17-18). While on the face of it the policy seemed non-threatening and pro-labour growth, there were wide-spread concerns expressed by trade unions who suggested that the policy would cause displacement of existing labour and that consequently the impact of the policy from a job-creation perspective would be ambiguous (PMG, 2013). South Africa's historical context has meant a deep distrust between unions and business, with prevailing labour market conditions in South Africa reflecting a political compromise between unions, business and government that often prevents meaningful labour reform (CDE, 2016:5; Natrrass, 2014:21-25). Although the merits for or against the YWS are beyond the scope of this paper, it's likely that if the YWS had first been implemented successfully inside an industry-targeted SEZ framework, that there would be less room for speculation as to its effectiveness.

5.4 A Labour-Intensive SEZ in South Africa – A Practical Example

The discussion thus far has indicated that effectively implemented SEZs may provide a solution in overcoming various impediments to growth in labour-intensive manufacturing industries. *Section 5.4* seeks to conceptualize this discussion using the example of a SEZ that targets South African *clothing* manufacturers to overcome various binding constraints to growth faced within the sector.

5.4.1 Incentives Offered

As noted by Aggarwal (2017: 4), there is no genetic list of success factors for a SEZ. Incentives offered must be determined by the case-specific critical success factors of the policy, and the industry-specific binding constraints that the incentives are designed to overcome. The incentives offered in the practical example to follow are based on two broad considerations. Firstly, global incentives offered to firms in SEZs were investigated in order to establish which were most commonly applied[16] and secondly, incentives were selected based on the theoretical and evidence-based constraints faced by clothing manufacturers in South Africa.

- **Corporate Tax Reduction:** Perhaps the most commonly applied SEZ incentive globally is a reduction in corporate tax in some form or another. This incentive is purely a fiscal benefit to entice investors and offers no strategic significance to the broader SEZ policy being proposed in this section. A reduction in the corporate tax rate is applied to clothing manufacturers inside the SEZ, with the reduction based on the prevailing corporate tax rate of 28%.
- **Wage Subsidy:** Wages in South African have risen faster than the improvements in labour productivity, adversely affecting the cost competitiveness of labour-intensive manufacturers. In industries such as *clothing,* where access to low-wage labour is often viewed as a competitive advantage, it is critical that relatively high wages be addressed in the short-term, allowing for labour-productivity to improve to the point that higher wages are justified in the future. Turkey provides a useful indication of this, where wages are almost twice those offered in South African clothing production, yet labour productivity is high enough to ensure that unit labour costs in Turkish clothing production

[16] Incentives were examined in SEZs from Bangladesh, Ethiopia, India, Philippines, Rep. of Korea, South Africa, Taiwan, Thailand and Vietnam. Incentives are classified as either fiscal or non-fiscal benefits. The output from this exercise is documented in *Table A1* in the appendix.

are more competitive than in South Africa. In the example to follow, a wage subsidy is applied to the bargaining council mandated minimum wage that firms inside the SEZ must be compelled to pay. SEZ firms pay employees the full mandated wage and receive the subsidy in the form of a rebate.

- **Training Grant:** Utilizing a wage subsidy to reduce the cost burden faced by firms inside the SEZ can only be viewed as a short-term solution (ILO: 2016:4). Over time, it is critical that labour-productivity improves so that reductions in the wage subsidy are offset by improvements in labour-productivity. To encourage the improvement in labour-productivity, a training grant is provided to SEZ firms, calculated as a percentage of their total wage bill.
- **Import Duty Reduction:** Reductions in import duties on intermediate goods are commonly utilized incentives in SEZs around the world. In the *clothing* industry, fabric is the most significant cost associated with the construction of a garment, with fabric constituting between 60 – 70% of cost of sales (Guiding Metrics. 2019; Techpacker.2019; Fibre2Fashion. 2019; Stitchworld. 2019.). In South Africa, fabric production and finishing capacity and capabilities, are significantly underdeveloped. Consequently, local *clothing* manufacturers are forced to source a majority of fabric from abroad and subject to import duties of 22%, making it difficult for local producers to remain cost competitive (Export.gov:2019). To combat this, a reduction in import duties is applied to the prevailing tariff rate of 22%.
- **Local Content Incentive:** As discussed earlier in this section, in order to develop broader developmental benefits from SEZs, it is critical that linkages to the rest of the economy are developed. When SEZs are targeted for specific industries, complementary policies to SEZs should aim to strengthen and expand relevant value chain components such that the SEZ is established as a growth pole for further development in the specific

value chain being targeted (World Investment Report. 2019:131). In the example to follow, complementary policies should focus on recapitalizing local textile production, such that the necessary capacity and capabilities are available to supply *clothing* manufacturers in the SEZ. At the same time, a local content incentive must be carefully implemented to coincide with a phasing out of the import duty reduction in order to induce a substitution effect from imported to local fabrics. A local content incentive is applied in this example as a percentage of total fabric sourced locally and is received in the form of a rebate.

- **Feasibility and Marketing Grant:** As noted by the International Labour Organization(ILO) (2016:6), consumer trends – notably in clothing production – are increasingly requiring suppliers to produce with ethical practices including labour standards. Consequently, improvements in labour-productivity should be driven by efficiency gains and not greater work intensity or longer working hours (ILO, 2016:7). Instead, improvements in productivity must be driven by adopting better technologies and production processes. Thus, an effective SEZ for *clothing* manufacturers must ensure that its design facilitates this process. In this example, the feasibility and marketing grant is provided to subsidize feasibility studies into the purchase and use of the latest technologies available, fund global best-practice study tours to world-class manufacturing facilities, and to subsidize travel to, and the participation in, global trade shows for clothing and textile manufacturers. Effective marketing strategies for South African SEZ firms and for South African SEZs in general, is an area identified for significant improvement (Special Economic Zones Advisory Board [SEZAB], 2018:29). In this example, the grant is applied as a percentage of total turnover.

5.4.2 SEZ Costs and Benefits

For the purposes of this analysis, the costs associated with the proposed SEZ for *clothing* manufacturers are categorized as either direct or indirect costs. Direct costs are tangible fiscal costs that are derived in the provision of SEZ incentives, including the wage subsidy, the training grant, local content incentive for local fabric purchases and the feasibility and marketing grant. Indirect costs are derived from the application of reduced tax rates in the sense that this constitutes forgone taxable income. Indirect costs are therefore incurred from forgone corporate tax income and forgone duties on imported fabric. Similarly, SEZ benefits are separated by direct and indirect benefits derived from the SEZ. Direct benefits include the employment generated by SEZ firms, corporate tax income (after accounting for the reduced corporate tax rate) and import duties (after accounting for the reduction in import tariffs). Indirect benefits include indirect jobs and taxable income generated from increased demand and production of local fabrics by South African textile manufacturers, as well as construction jobs required to produce new factories inside the SEZ.

5.4.3 Analysis Assumptions and Applied Rates

Table 5.3 below details the various analysis assumptions and applied rates utilized in the example, as well as a brief description of how assumption values were calculated and the sources where relevant variable data was sourced. In all cases, figures have been converted to 2017 Rands for correctness in comparison. Each assumption and applied rate is described briefly below:

- **Number of employees:** This denotes the average number of employees per clothing manufacturer in the UNIDO Indistat database. It is calculated by dividing the total number of employees in the clothing industry by the total number of clothing manufacturers.

- **Monthly Wage Per Employee:** The monthly wage per employee is taken from the bargaining council agreed minimum wage for clothing machinists as of September 2018. The agreement is applicable until the end of August 2024. The agreement differentiates between *learner* workers and *qualified* workers, allowing for lower rates paid to learners. Following 1.5 years of experience, a *learner* is classified as *qualified* and must be paid the appropriate rate for a *qualified* machinist. These nuances are accounted for in the practical example (Department of Labour, 2018:6).
- **Total Turnover:** Total turnover is calculated by using the average turnover per rand of employee cost for the clothing industry between 2012 and 2017. The StatsSA Financial Statistics database provides data on aggregated industry-specific turnover and income (disaggregated by item), expenditure (disaggregated by expenditure item) and profitability values before tax. The average turnover generated per Rand of employee cost is multiplied by total employment cost of the example SEZ firm to arrive at an estimated turnover.
- **Fabric costs:** Total fabric cost of sales is calculated using an assumed fabric cost of sales figure of 60% of total cost of sales.
- **Labour Productivity Improvements:** Assumed labour productivity improvements are derived from two sources. First, the average gains in labour productivity as derived from the DTI's Sectoral Economic Indicators dataset between 2012 and 2017. This is then applied to the low growth in labour productivity scenario to follow in the example below. A second labour productivity improvement is applied to a high labour productivity improvement scenario in the example to follow. This is calculated as the average labour productivity improvement achieved by countries in the upper quartile in the clothing industry between 2012 and 2016. This is derived from the UNIDO Indistat dataset.

Table 5.3: Analysis Assumptions and Applied Rates in SEZ Practical Example

Analysis Assumptions & Applied Rates	Description	Source
Number of employees	Average number of employees per clothing firm in Unido Indistat database	UNIDO Indistat database
Monthly wage per employee (R's)	Agreed monthly wage as per SACTWU bargaining council agreement. Assumed that employees have zero experience when starting and are qualified machinists after 1.5 years. A learner rate is applied for the first 1.5 years and a qualified machinist rate is applied thereafter	Department of Labour
Annual wage per employee (R's)	Monthly wage multiplied by 12 months	Calculated
Total annual wage bill (R's)	Annual wage multiplied by the number of employees	Calculated
Total turnover (R's)	Average turnover per Rand of employee cost for the clothing industry between 2012 - 2017	Stats SA Annual Financial Statistics Dataset
Fabric cost of sales (R's)	Assumed at 60% based on a garment costing breakdown cited in various garment industry websites	Fibre2fashion, Stitchworld, Techpacker
Total imported fabric (R's)	Calculated by multiplying the import penetration ratio by total fabric cost of sales	Calculated
Assumed taxable corporate income	Calculated from average EBITDA for clothing manufacturers between 2012 - 2017	Calculated
Turnover per unit of employee cost (R's)	Turnover divided by wage bill	Calculated
Labour productivity improvement (% change)	Scenario 1: Average LP improvement in SA clothing industry between 2012 - 2017. Scenario 2: Average LP improvement in top 10 countries from the UNIDO Indistat database between 2012 - 2016	DTI, UNIDO
EBITDA excluding subsidies (% of turnover)	Average EBITDA for clothing manufacturers between 2012 - 2017	Stats SA Annual Financial Statistics Dataset
Fabric import penetration ratio	Total imported woven, knitted and crocheted fabrics divided by total consumption of woven, knitted and crocheted fabrics in 2016	CottonSA
Fabric cost of sales (% of turnover)	Assumed % fabric cost of sales multiplied by annual turnover	Calculated
Local fabric cost of sales (% of total fabric cost of sales)	1 minus import penetration ratio multiplied by total fabric cost of sales	Calculated
Import duty on fabric	Current import duty on fabric in South Africa	SARS, DTI
Corporate tax rate	Current corporate tax rate	SARS

- **EBITDA:** EBITDA is derived from the StatsSA Financial Statistics dataset between 2012 and 2017 for clothing manufacturing in South Africa. EBITDA is then used as a proxy for taxable income.
- **Import Penetration Ratio:** The import penetration ratio is calculated by summing the total finished fabric production in South Africa and finished fabric imports, and dividing finished fabric imports by the summed amount (CottonSA, 2017:9; International Trade Centre, 2019).

5.4.4 An SEZ for Clothing Manufacturers in South Africa

Table 5.4 below details the estimated costs and benefits associated with a labour-intensive SEZ specifically for clothing manufacturers. The example uses two scenarios over a ten-year period to illustrate the different estimated impacts from an SEZ policy that doesn't actively utilize the SEZ as a growth hub for the broader economy (**Scenario 1**) and an SEZ that is utilized to stimulate growth in the economy through linkage development (**Scenario 2**), in line with international best-practice as discussed in the sub-sections above. In both scenarios, the example expresses all costs and benefits associated with a single firm that choses to open a clothing factory inside the SEZ. It is important to note that the size and form of the various incentives deployed in the examples to follow are used merely as an illustrative example, rather than a hard and fast recommendation on the form that these incentives should take. The size and form of incentives can therefore be altered to form a variety of policy combinations designed to benefit manufacturers from a specific labour-intensive industry.

Table 5.4 Estimated Costs and Benefits of a Labour-Intensive SEZ For Clothing Manufactures

	Scenario	Scenario 1			Scenario 2		
	Period	**Year 1 - 3**	**Year 4 - 6**	**Year 7 - 10**	**Year 1 - 3**	**Year 4 - 6**	**Year 7 - 10**
Assumptions & Applied Rates	Number of employees	682	682	682	682	682	682
	Monthly wage per employee (R's)	4,332	4,860	5,160	4,332	4,860	5,160
	Annual wage per employee (R's)	47,652	53,460	56,760	47,652	53,460	56,760
	Total annual wage bill (R's)	32,498,664	36,459,720	38,710,320	32,498,664	36,459,720	38,710,320
	Total turnover (R's)	220,340,942	257,851,088	285,567,215	220,340,942	284,276,437	347,098,020
	Total Cost of Sales (R's)	176,272,754	206,280,870	228,453,772	176,272,754	227,421,149	277,678,416
	Fabric cost of sales (R's)	105,763,652	123,768,522	137,072,263	105,763,652	136,452,690	166,607,050
	Total imported fabric (R's)	72,744,240	85,127,990	94,278,303	72,744,240	68,226,345	33,321,410
	Assumed taxable corporate income (R's)	20,293,401	23,748,085	26,300,741	22,034,094	28,427,644	34,709,802
	Turnover per unit of employee cost (R's)	7	7	7	7	8	9
	Labour productivity improvement (% change)	-	4.31%	4.31%	-	15%	15%
	EBITDA excluding subsidies (% of turnover)	9.2%	9.2%	9.2%	9.2%	9.2%	9.2%
	Fabric import penetration ratio	69%	69%	69%	69%	50%	20%
	Fabric cost of sales (% of turnover)	60%	60%	60%	60%	60%	60%
	Local fabric cost of sales (% of total fabric cost of sales)	31%	31%	31%	31%	50%	80%
	Import duty on fabric	22%	22%	22%	22%	22%	22%
	Corporate tax rate	28%	28%	28%	28%	28%	28%
Incentives Offered	Wage subsidy per employee (% of annual salary)	50%	40%	30%	50%	40%	30%
	Feasibility and marketing grant (R's)	150,000	50,000	50,000	150,000	50,000	50,000
	Training grant (% of wage bill)	0.38%	0.38%	0.38%	1.5%	1.5%	1.5%
	Import duty reduction (% of import duty)	100%	100%	100%	100%	50%	25%
	Applied corporate tax rate (% of taxable income)	14%	14%	14%	14%	14%	14%
	Local content incentive (% of local fabric purchased)	0%	0%	0%	10%	20%	30%
Direct Costs	Wage subsidy per employee (R's)	16,249,332	14,583,888	11,613,096	16,249,332	14,583,888	11,613,096
	Feasibility and marketing grant (R's)	1,101,705	1,289,255	1,427,836	1,101,705	1,421,382	1,735,490
	Training grant (% of wage bill)	123,495	138,547	147,099	487,480	546,896	580,655
	Local content incentive (R's)	-	-	-	3,301,941	13,645,269	39,985,692
Indirect Costs	Forgone import duties (R's)	16,003,733	18,728,158	20,741,227	16,003,733	7,504,898	1,832,678
	Forgone corporate tax (R's)	2,841,076	3,324,732	3,682,104	3,084,773	3,979,870	4,859,372
SEZ Income	Additional taxable income (R's)	2,841,076	3,324,732	3,682,104	3,084,773	3,979,870	4,859,372
	Additional import duties (R's)	-	-	-	-	7,504,898	5,498,033
Indirect Effects	Additional output demand from local textile producers (R's)	33,019,412	38,640,533	42,793,961	33,019,412	68,226,345	133,285,640
	Average cost per textile employee (R's)	52,036	52,036	52,036	52,036	52,036	52,036
	Additional textile labour cost (R's)	4,622,718	5,409,675	5,991,154	4,622,718	9,551,688	18,659,990
	Additional textile jobs created			115			359
	Additional taxable income (R's)	1,386,815	1,622,902	1,797,346	1,386,815	2,865,506	5,597,997
	Additional construction jobs			239			239
Totals	**Total direct cost of SEZ per firm (R's)**	**17,474,532**	**16,011,690**	**13,188,031**	**21,140,458**	**30,197,435**	**53,914,933**
	Total indirect cost of SEZ per firm (R's)	**18,844,809**	**22,052,890**	**24,423,330**	**19,088,506**	**11,484,768**	**6,692,050**
	Total direct and indirect income (R's)	**2,841,076**	**3,324,732**	**3,682,104**	**3,084,773**	**11,484,768**	**10,357,405**
	Net cost of SEZ per firm over 10 years (R's)			**306,442,111**			**352,773,610**
	Total SEZ jobs created per firm			**682**			**682**
	Total indirect jobs created per firm			**239**			**598**
	Total jobs created per firm			**921**			**1,280**
	Net cost over 10 years per SEZ job created (R's)			**332,836**			**275,669**
	Net cost over 10 years per SEZ job created (R's)			**33,284**			**27,567**

Author's own calculations

5.4.4.1 <u>Scenario Comparisons</u>

Critical Success Factors (CSFs)

The CSFs are different for both scenarios. In ***Scenario 1*** the CSFs are to encourage investment in clothing manufacturing inside the zone and in doing so, create direct employment of low and semi-skilled labour. Consequently, various incentives are applied in accordance with this purpose. In ***Scenario 2***, the CSFs also seek to encourage investment and direct employment in the SEZ but this is not the sole CSF. In this case, another CSF is the development of strategic value chain linkages as a means of generating SEZ derived benefits for the rest of the economy. Consequently, the incentives and policies applied in the SEZ will differ when compared to ***Scenario 1*** in that they are designed to meet this objective.

Reduced Wage Cost

In both scenarios simulated, for the first 3 years that the hypothetical firm is located in the SEZ, a wage subsidy of 50% is applied. This allows the firm to still pay the Bargaining Council compliant (BCC) minimum wage for the clothing industry, such that the annual wage of a worker is equal to R47,652. However, the cost to the firm is only R23,826 when accounting for the subsidy. In 2015 US dollar terms, this is the equivalent of $145 per month which is lower than the minimum monthly wage paid in clothing industries in China ($155), Philippines ($150), Malaysia ($225) and Thailand ($237) (ILO, 2016:4)[17]. Every three years, the wage subsidy is reduced by 10% based on the assumption that an ongoing wage subsidy is not sustainable and that worker productivity levels will improve over time such that the impact of rising wage costs on unit labour costs will be mitigated to some extent. In both scenarios, in its

[17] Exchange rate and consumer price index (CPI) data for the USA and South Africa are sourced from the World Bank's World Development Indicators database.

entirety over the 10-year period a wage subsidy for 682 employees, who receive the BCC minimum wage, would cost R16.2 million per year for the first 3 years, R14.5 million in the second 3 years, and R11.6 million in the final 3 years (2017 Rands).

Reduced Fabric Cost and Local Content Incentives

In both scenarios, the cost of imported fabric is reduced by applying a 100% reduction in the 22% import tariff for the first 3 years the hypothetical firm is operational inside the SEZ. For the ***Scenario 1*** firm, the 100% tariff reduction is applied for the whole 10-year period, as no local content incentive is offered because encouraging local sourcing is not a strategic priority for SEZ success. However, in ***Scenario 2*** because a key objective is to stimulate linkages in the rest of the economy, the reduced tariff incentive is phased out over time, coinciding with an increased local content incentive over time. In doing so, it is assumed that SEZ firms will be encouraged to substitute imported fabric for local fabric, stimulating demand in the local economy. As a result of this increased demand for local fabrics, indirect job-creation potential is enhanced. However, this will not happen unless policies complimentary to the SEZ policy seek to develop local fabric production and finishing capabilities in the local textiles industry. In this case, the SEZ policy will only form part of a broader strategic industrial policy approach that seeks to develop the clothing manufacturing value chain rather than a simple investment promotion tool. In ***Scenario 1***, the cost of the reduced tariff on imported fabric over the course of 10 years is estimated to be R16 million per year for the first 3 years, R18.7 million for the second 3 years and R20.7 million per year for the final 3 years (2017 Rands) in forgone import duties for the State, while in ***Scenario 2*** the estimated cost of the reduced tariff on imported fabric, as well as the local content incentive over the first 3 years is estimated at R19 million per year for the first 3 years, R11.4 million for the second 3 years, and R6.7 million per year for the final 3 years (2017 Rands).

Labour Productivity Improvements

Because a wage subsidy is not sustainable in perpetuity, there must be another means by which unit labour costs are maintained. Implicitly, labour productivity improvements become a critical factor in ensuring that SEZ firms remain in situ after a wage subsidy is phased out over time. As noted by the International Labour Organization (2016:9), more non-wage factors are driving purchasing and sourcing decisions of large European and North America apparel retailers as consumers become ever more aware of where products come from and the environment in which they were produced. Among these are ethical working conditions and remuneration policies of clothing manufacturers. Consequently, in order to keep unit labour costs low via rapid labour productivity improvements, an SEZ environment that offers firms a means of improving skills and production processes, as well as a mechanism to be exposed to and disseminate new technology, is likely to be a source of attraction as it offers a meaningful way of improving productivity levels of labour. Moreover, this offers the greatest opportunity for firms to move up the value chain into higher value-added products and support services (ILO, 2019:8).

In ***Scenario 1***, the SEZ is designed to reduce the cost for SEZ firms as much as possible by means of incentives. Consequently, in this scenario it is assumed that there is no concerted effort to encourage value chain upgrading and skills development. Consequently, improvements in labour productivity are kept constant at 4.31% p.a, the average rate of labour productivity improvement in the South African clothing industry between 2012 and 2017, while the training grant offered to investors is the equivalent of 0.38% of the total wage bill, which is the average in the South African clothing industry between 2012 and 2017.

In contrast, ***Scenario 2*** is designed to enhance the long-term development of the local clothing value chain. Consequently, a training grant is designed that will provide a training allowance approximately 5 times the current average clothing manufacturer's training spend in South Africa. Thus, a training grant of 1.5% of total wage bill is provided to SEZ firms. An emphasis on training and upskilling of labour provides a useful opportunity to engage private sector training firms to provide the specific training required by SEZ firms such as TVET Colleges South Africa, who offer specialized training for machinists in the clothing industry (TVET, 2019). As a result of the emphasis on improving labour productivity, a labour productivity improvement of 15% is assumed for ***Scenario 2***, in line with productivity gains of upper quartile clothing manufacturing countries (UNIDO, 2019).

Incentives and The Cost of Job Creation

The total net cost per firm over the course of the full 10-year period in ***Scenario 1*** is estimated to be R306.4 million (2017 Rands), averaging R30.6 million per year. This equates to R332 836 over ten years per direct and indirect job created per firm, with a total of 682 direct manufacturing jobs created, 115 indirect textile manufacturing jobs created and 239 construction jobs created per firm[18]. In ***Scenario 2***, the cost total net cost per firm over the 10-year period is R352.7 million (2017 Rands), averaging R35.2 million per year. Since this scenario is expected to generate larger employment multiplier effects in the broader economy, this equates to an estimated R275 669 per job created, with 682 direct manufacturing jobs created, 359 indirect textile manufacturing jobs created and 259 construction jobs created.

As is the case with any policy decision, it is critical to trade-off the costs and benefits of various policy options against each other. *Table 5.5* below details total cost of incentives provided to the various provincial SEZ programmes in South Africa as detailed in the 2017/2018 Annual National Incentives Report (ANIR) (DTI, 2018:58). The report indicates

[18] Construction jobs are calculated based on the ratio of construction jobs created per firm invested in South Africa's current SEZs, which stands at 1.32 jobs created per firm (DTI, 2018).

Table 5.5 Cost of Incentives for Provincial SEZ Programmes

Province SEZ Programme	Cost of Incentives	Estimated Jobs Created	Cost Per Job Created
Eastern Cape	R731 million	881	R 829 739
Free State	R192 million	609	R 315 271
Gauteng	R141 million	291	R 484 536
Kwa-Zulu-Natal	R183 million	15	R 12 200 000
Limpopo	R10 million	9	R 1 111 111
Scenario 1*	R306 million	921	R332 836
Scenario 2*	R352 million	1280	R275 669

Source: DTI, 2018.
*** Cost of incentives for Scenarios 1&2 refers to the total 10-year cost per firm investing in the SEZ.**

that in the 2018 financial year, the value of incentives paid to various provincial SEZ programmes varied greatly, with the Eastern Cape receiving the highest value of incentives and grants at R731 million, while the Limpopo only received R10 million. Most significant however, is that in all cases except the Free State, the cost of the incentives per estimated job created is higher than in the either of the two scenarios reviewed in this paper.

The ANIR also details the incentives and subsidies paid out to various manufacturing industries. *Table 5.6* below indicates the value of incentives paid to the *motor vehicles*, *chemicals, and clothing and textiles* manufacturing industries. Given the size of the *motor vehicles* and *chemicals* industries in South Africa relative to *clothing* and *textiles*, it's not surprising that the value of incentives paid out is significantly larger for the former two industries relative to the latter. However, when investigating the cost per job created, it's clear that the employment returns from incentives paid to the *clothing* and *textiles* industries are significantly more attractive cost-effective when compared to *motor vehicles* and *chemicals*.

The cost of incentive per estimated job created in *clothing* and *textiles* is R152,542, compared to R1.5 million for *motor vehicles* and R996,016 for *chemicals.*

Table 5.6 Incentives Paid to the Motor Vehicles, Chemicals and Clothing Textiles Industries in Financial Year 2018

Manufacturing Industry	Cost of Incentive	Projected Jobs Created	Cost Per Job Created
Motor Vehicles	R2.7 billion	1736	R 1 555 300
Chemical Products	R1.5 billion	1506	R 996 016
Clothing and Textiles	R144 million	944	R 152 542

Source: DTI 2018.

5.5 Discussion and Concluding Remarks

The practical scenarios provided in this section provide an indication of how SEZs can be utilized, not merely as investment promotion tools, but as strategic policy instruments that form part of a concerted policy approach targeting industries that offer the greatest job-creation potential. Latecomer countries to SEZ implementation have tended to utilize SEZs as a quick-fix solution for rapid investment and job-creation (World Investment Report, 2019:131). However, international experience suggests that SEZs can play a far more meaningful role in broader economic development, if the right supporting polices are utilized to generate value chain linkages with firms in the broader economy (Farole and Sharpe, 2017:12).

However, as noted by Kaplan (2016:4), any SEZ policy must be carefully considered to prevent firms in the domestic economy from simply relocating to an SEZ in order to benefit from the incentives offered. One option would be to allow only new investments access to the SEZ. However, this option would likely create distortions in the domestic economy, whereby firms operating inside the zone would have a competitive advantage over competing firms in the broader economy. Another option would be to provide similar support to firms operating outside of the SEZ that are part of the same value chain, using the SEZ merely as a growth pole for broader value chain development. To this end beyond the attractive fiscal incentives, the

SEZ would need to provide large investors with access to world-class infrastructure and trade facilities, tailored support service offerings and dedicated assistance in terms of customs, training, industry analysis and research, marketing and trade facilitation services such as trade shows. Beyond the SEZ, if supporting industrial policy could effectively develop suppliers to SEZ firms, then strategic supply chain linkages in close proximity would provide further advantages to investors assessing the viability of investing inside of the SEZ.

The data presented *Table 5.6* clearly indicates that the cost of incentives, with particular reference to job creation, is significantly lower in the labour-intensive *clothing* and *textiles* industry than in the *motor vehicles* and *chemicals* sectors. *Table 5.4*, utilizing the clothing and textiles industry as an example, demonstrates how an SEZ can provide the catalyst required for rapid investment and growth in a specifically designated area (***Scenario 1***). ***Scenario 2*** demonstrates that further to a designated SEZ, complimentary policies in the broader economy, provide a more strategic approach to large-scale employment. This kind of strategic value chain support would not be new to South African policy makers. As previously discussed, significant strategic State support has been offered throughout the automotive value chain since the launch of the MIDP in 1995 and the introduction of various other programs thereafter (DTI, 2018). On the back of this support, *motor vehicle* production and associated value chain components have grown significantly (*see industry analysis in previous sections*). If government had the same conviction for rapid job-creation for low-skilled labour in South Africa, then supporting labour-intensive industries in the same way, using a labour-intensive SEZ as the catalyst, may provide a possible solution.

CONCLUSION

The evidence presented in this paper suggests that the comparative advantage for South African manufacturing lies, somewhat paradoxically, in capital-intensive production, strongly contrasting manufacturing industries in other developing countries of similar macroeconomic dispositions. However, this advantage has not developed organically, but has been shaped over time by industrial policy that has consistently incentivized investment in capital, energy and resource-intensive industries encompassing the countries MEC. *Pre*-1994, policy strategy was certainly one of capital deepening, with growth in aggregate manufacturing output driven almost exclusively by large-scale investment in capital, while net manufacturing employment was in decline by as early as 1979. This outcome, in the context of an abundant supply of low-skilled labour, indicates that not only was policy distortive but it was comparative advantage *defying* as well. While central industrial policy *post*-1994 has consistently stated employment creation as a central objective, evidence suggests that a majority of support is still weighted heavily in manufacturing industries that are both capital and skill-intensive. Thus, while policy has to some extent managed to develop manufacturing industries outside of the MEC – such as the rapid expansion in motor vehicle production – this development has not resulted in any meaningful job-creation.

While policy has undoubtedly played a role in developing a comparative advantage in capital-intensive production, a lack of labour cost competitiveness has also contributed. Real wage increases in South African labour-intensive manufacturing industries have outstripped gains in labour productivity resulting in consistently rising unit labour costs relative to foreign competitors. Coupled with rapid trade liberalization *post*-1994, local labour-intensive firms were consequently faced with a deluge of imports from low cost foreign competitors resulting in stagnating and even negative growth in industries that have traditionally offered the greatest potential for job-creation.

If combatting persistently high unemployment remains the critical fundamental challenge in South Africa, then the evidence presented in this paper indicates that in order for the manufacturing sector to play a meaningful role in this regard, there must be growth in industries that have the potential to absorb surplus low-skilled labour in the economy. Growth in industries that have traditionally formed the foundations of South Africa's industrial capacity has proven to be insufficient and incapable of providing the large-scale job-creation required to meaningfully combat unemployment.

Notwithstanding this fact, the evolution of South Africa's manufacturing sector suggests that strategic and purposeful industrial policy has the potential to leverage available factors of production to develop globally competitive industries. In this sense, there is a strong suggestion that if similar policy impetus were to incentivize investment in labour-intensive industries, then similar outcomes can develop. Beyond the obvious positive socio-economic externalities associated with improved employment outcomes, the economy-wide efficiency gains associated with absorbing currently unproductive labour in productive manufacturing activities are likely to be significant relative to the cost of support required from the State. Therefore, an industrial policy strategy that emphatically targets growth in labour-intensive industries makes not only socio-economic sense but there is a strong economic case as well. This is not to say that policy support should be entirely reallocated from capital to labour-intensive industries, but rather that similar support in labour-intensive industries has significant socio-economic and productive upside potential.

Bearing in mind various institutional factors (formal and informal) and cost implications that would have to be considered in implementing a policy approach targeted exclusively at manufacturing industries with high job-creation potential, this paper suggests SEZs as a policy tool that might form the cornerstone of such an approach. SEZs have often been implemented as enclaves from the broader host economy to overcome various impediments to achieving broader economic development outcomes. As indicated by *Scenario 1* in the practical SEZ example, a SEZ approach is certainly a cost-effective option for South Africa, as the cost per job created is likely to be far less than other policies implemented elsewhere in the economy. However, the enclave nature of many SEZs around the world, and indeed in the design element of *Scenario* 1, that has often prevented SEZ associated benefits from being accrued elsewhere in the economy and has thus limited its impact as a driver of sustainable structural change. Thus, the recommended option is that SEZs be used as a value chain growth-pole, whereby investment in the SEZs catalyzes multiplier effects throughout the local value chain, as was exemplified by *Scenario 2* in the practical SEZ example. This, combined with strategic support to various value chain components elsewhere in the economy, offers significant upside potential from an employment perspective at a cost that is more than competitive with policies being implemented elsewhere in the economy.

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