THE COMPETITIVE PLATFORM FOR INDUSTRIAL DEVELOPMENT IN SOUTH AFRICA

By

EWERT PHILIPPUS JOHANNES KLEYNHANS

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Duncan Kleynhans

PREFACE

"O the depth of riches both of the wisdom and knowledge of God! How unsearchable are his judgements, and his ways past finding out! For him, and through him, and to him, are all things" (Rom. 11:33 & 36). *"But where shall wisdom be found? And where is the place of understanding?"* (Job. 28:12). The University grants one the opportunity to search for wisdom, insight, deeper thought and understanding. It presents the opportunity to make the world a better place for all, thereby answering to the cultural command of development and conservation (Gen. 3:8) and practical realisation of the command to love thy neighbour.

"Everyone naturally desires knowledge, but of what use is knowledge itself without the fear of God? A humble countryman who serves God is more pleasing to him than a conceited intellectual who knows the course of the stars, but neglects his own soul. A man who truly knows himself realises his own worthlessness, and takes no pleasure in the praises of men. Did I possess all knowledge in the world, but had no love, how would this help me before God" (Thomas Kempis)

The under-development economic problems of the South African community present major challenges to the social scientists of the day. Poverty, inequality and unemployment lead to so much hardship and our people are in a poverty trap from which they cannot escape. With no fruit on their labour they are only sinking deeper into poverty and there is no hope for tomorrow. These people cannot be expected to work productively, respect another's property and lives or to belief in the loving God. We as economists may not rest in searching for solutions to these problems. Christians cannot sleep peacefully when half of the country's people are living in despair. It is ones Christian duty to make the world a better place for everyone. If one do not address the socio- economic problems in the country, those have that lives below the bread line constitute a major burden to the tax payer and curb profits, leading to non-optimal utilisation of our scarce resources. They are part of the possible labour force that could increase our national product and income to everyone's benefit and also represents a very large latent consumer demand that are lost for entrepreneurs and could have generated economic prosperity, income and employment.

The evolution of economic thought and conventional wisdom leads to certain set ideas that cannot even erase poverty, unemployment and homelessness in the United States. Economists have a duty to strive for solutions that would broaden people's choices and help everyone to live a happy and fruitful live. That is our Christian duty. We do not think that current policies are the solution, but this leads us to search further for solutions. *Ubi dubi ibi libirtas.* I doubt, therefor I am free. We are free to ponder over the problems of our time and may improve the living situations of others.

The knowledge, insight, wisdom and tools that we posses today, enable economists to improve the living conditions of others as never before. It fills a Christian's heart with joy and inspiration to work towards a better tomorrow. This thesis is an attempt to contribute towards that means. This country has tremendous potential and it is our duty and our privilege to search for ways and means to develop that potential.

The following people deserve my sincere appreciation for their assistance, without which I would never been able to complete this study:

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I dedicate this dissertation to my son Duncan Kleynhans for all his sacrifice and support.

Sola Gratia

"Laudate Dominum de coelis; laudate eum in excelsis" (Psalm 48;1)

Ewert Kleynhans

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ABBREVIATIONS

CBD	-	Central Business District
DC	-	Developed Country
DTI	-	Department of Trade and Industry
EIA	-	Environmental Impact Assessment
EOQ	-	Economic Order Quantity
EPZ		Export Processing Zone
EU	-	European Union
FTA	-	Free Trade Area
FDI	-	Foreign Direct Investment
GATT		General Agreement on Tariffs and Trade
GEAR	-	Growth, Employment and Redistribution Strategy
GGP	-	Gross Geographic Product
HDI		Human Development Index
HDR	-	Human Development Report
ICF		Industrial Competitiveness Framework
IDZ		Industrial Development Zone
ISI		Import Substitution Industrialisation
JIT	-	Just-In-Time (Production)
LDC	-	Less Developed Country
MCC	-	Maputo Corridor Company
MDC	-	Maputo Development Corridor
MDP	-	Manufacturing Development Programme
MNC	-	Multinational Corporation (also MNE)
MVA	-	Manufacturing Value Added
NSI	-	National System of Innovation
OEM		Original Equipment Manufacture
PDC	-	Previously Disadvantaged Communities
PIMMS	-	Planning and Implementation Management Support System
PPF	-	Production Possibility Frontier
PPP	-	Public-Private Partnership
R&D	-	Research and Development
RDP	-	Reconstruction and Development Programme

RIDP	-	Regional Industrial Development Program
SADC	-	South African Development Community
SDI	-	Spatial Development Initiative
SET	-	Science, Engineering and Technology
SIC	-	Standard Industrial Classification (Code)
SME	-	Small and Medium Enterprises
SMMDP	-	Small and Medium Manufacturing Development Programme
SMME	-	Small, Micro and Medium Enterprises
SPII	-	Support Programme for Industrial Innovation
SSA	-	Sub-Saharan Africa
TRIMS	-	Trade Related Investment Measures
THRIP	-	Technology and Human Resources for Industry Programme
TNC	-	Trans-National Corporation
UNIDO	-	United Nations Industrial Development Organisation
WEF	-	World Economic Forum
WEFA	-	Wharton Econometric Forecasting Associates
WTO	-	World Trade Organisation

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Abstract

This competitiveness platform of South African manufacturing industries is investigated in this study. The various aspects that determine international competitiveness are studied and the strengths and weaknesses are established. The study also considers differences in competitiveness due to firm-size, and compares the competitiveness of the various provinces and the manufacturing sub-sectors.

According to Porter (1998a:71) the competitive platform embraces all aspects relevant to competitiveness that enables firms to compete and industries to develop. The platform therefore includes all the relevant aspects of management, firm structure, conditions of input factors of production and demand conditions, while it utilises related and supporting businesses and institutions. This foundation includes government policies, the quality of human capital, level of technology and factors that enable firms to prosper and grow in future, amongst others.

The study commenced with an investigation into the theory of industrial policy stressing the importance of competitiveness and the lowering of the marginal cost structures in an effort to develop local industries. The objectives of industrial policy were considered as well as the ways in which it can enhance competitiveness on firm-level. This was followed by studying Porter's approach to the competitive platform, drivers of competitiveness and the stages of competitive development.

The practice of industrial policy was considered and specific attention was given to macroeconomic policies and the way it can influence industrial competitiveness, followed by a study of active and selective interventions and functional policies. The acquisition of technological capacity, education and training and the improvement of managerial practices to enhance competitiveness as well as the limitations of industrial policy, were considered. These include the lack of clear objectives, inefficient information and lack of skills, inflexibility, the agency problems, sectional interest groups and corruption.

Following this, the theory of industrial location was studied as the development of less developed regions is a significant problem in the South African spatial economy. The traditional factors of location were considered followed by a study of the modern explanations of the locational decisions of manufacturing firms. These factors focus on agglomeration and increasing returns, a specialised labour pool, specialised intermediate inputs, transport costs, historical factors, and knowledge and technological spill-overs. Then the regional development was examined, focusing

on practical factors and the product cycle model, stages in spatial development, and regional development through the development of transport infrastructure.

This study put the emphasis on individual firms as it is in the first place firms that compete and not countries. The policy framework in which firms develop and prosper do however have a significant influence on firms as an important part of the competitive platform and the South African policies and strategies were therefore studied. Attention was given to the historical development of industrial policy in South Africa up to the acceptance of the *Integrated Industrial Strategy* in 2001 and the *Integrated Manufacturing Strategy* in 2002. The macroeconomic context for industrial development was considered followed by an overview of the GEAR strategy, Spatial Development Initiatives (SDIs), Industrial Development Zones (IDZs) and competition policy. Finally, the industrial development policy of South Africa was studied in detail.

An empirical investigation was conducted to establish the level of development of the South African industrial competitiveness platform. This part of the study first considered various studies done on South African competitiveness in the recent past. The provincial cluster potential was identified in the various provinces, linkages and competitiveness identified, and the local comparative advantages of the various regions and municipalities that can be derived from the Planning and Implementation Management Support System (PIMMS) database, researched. This gave a picture of the country's competitiveness on a national, provincial, regional, industrial and local level. Special attention was also given to the National Enterprise Survey and the World Bank Survey on the Greater Johannesburg Metropolitan Area, focusing especially on the obstacles to competitiveness.

The core contribution of this study is an empirical analysis of a survey conducted during 2002 on the competitiveness platform of South African manufacturing firms. It was found that although manufacturing firms do not rate as very highly competitive, the results were better than was expected, especially with regard to their managerial proficiency, product quality and technological resources and expertise. This survey highlighted the reliability and quality of communication services, electrical supply, water and other utilities, which are rated very high by all respondents. The study revealed much detail, like the need for cold storage facilities that presents a problem to many manufacturers. Most firms experience a shortage of artisans and there exists a need for more training facilities, especially for vocational and industry related training. Respondents rated harbour and ocean freight facilities as failing. It was also seen that although distance from the sea presents a competitive disadvantage to landlocked provinces, firms near a long coastline do not gain competitive advantages from it. KwaZulu is the only province that enjoys some benefit from its harbours. The same applies to the province with large airports.

Poor perception of the government and the civil service was the strongest factor depressing competitiveness according to respondents. Manufacturers perceive civil servants as inefficient, the civil service as non co-operative and the government as incompetent. Industrial standards, workplace regulations and laws and environment protection legislation and guidelines are also seen as very costly and mostly lacking and unclear. Much have to be done to improve the image of the government and civil service.

The main elements of the competitiveness platform in South Africa that present obstacles and impede industrial development can be summarised as:

- Poor human capital
    - Especially low productivity, motivation and work ethic
    - Insufficient vocational and industry related training facilities
    - A shortage of artisans
- Inefficient support services
- Poor perception of the government
    - Inefficient and non co-operative civil service
    - A lack of government assistance, information, aid and incentives
    - Political and policy instability
- A poor technological platform in some industries like electronics
- High costs, taxes and interest rates
- Shortages of raw materials; and
- Poor market demand.

It was found that the competitiveness indices of large firms are higher than small firms for all sub-categories. Large firms produce better quality and are superior with regard to strategy, structure, management and the utilisation of related and supporting industries and institutions. The productivity index also correlated with firm size.

The most competitive provinces are the North West, KwaZulu and Mpumalanga. Although Gauteng is the largest contributor to South Africa's GDP it is not the most competitive. The competitive platform of each province reveals its own set of problems but those stated above occur in all. The sub-sectors of the provincial competitiveness indices suggest an agenda for development. Finance, management and infrastructure deserve special attention in Gauteng, for example; local economy, internationalisation and people in North West, while the Western Cape has to focus on its local economy, business efficiency, internationalisation, infrastructure and human capital. Limpopo, Western Cape and the Northern Cape have the lowest productivity

indices and attention should be given to the development of human capital and science and technology in an effort to improve efficiency and productivity.

When the competitiveness of ten major manufacturing sub-sectors was studied it was found that the competitiveness of the different sub-sectors is more or less equal. Food processing and transport equipment manufacturers seem the most competitive, but the others not much worse. An alarming aspect was the low level of technological proficiency, expertise and innovation in the science- and technology-based industries like chemicals and electronics. If South Africa is to survive in the new economy, its level of technological expertise, capabilities and capacity will have to be improved considerably.

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Opsomming

Die mededingendheidsplatform van Suid-Afrikaanse nywerhede is ondersoek in hierdie studie, met die fokus op vervaardigers. Die onderskeie aspekte wat internasionale mededingendheid bepaal is bestudeer en die sterk- en swakpunte bepaal. Verskille in mededingendheid weens firma-grootte en die mededingendheid van die verskillende provinsies en die sub-sektore van vervaardiging is ook ondersoek en empiries getoets.

Volgens Porter (1998a:71) bestaan die mededingendheidsplatform uit alle aspekte van mededinging wat firmas in staat stel om mee te ding en nywerhede te laat ontwikkel. Die platform sluit bestuur, firma struktuur, die toestande van produksiefaktore en markvraag in, asook die benutting van verwante en ondersteunende besighede en instellings. Die platform bevat onder andere ook owerheidsbeleid, die kwaliteit van menslike kapitaal, vlak van tegnologie en faktore wat firmas in staat stel om te floreer en volhoudend te groei.

Die studie begin met 'n ondersoek na die teoretiese onderbou van nywerheidsbeleid. Dit illustreer die noodsaaklikheid van mededingendheid en verlaging van marginale kostestrukture ten einde plaaslike nywerhede te ontwikkel. Die doel van nywerheidsbeleid is ondersoek asook maniere om mededingendheid op firmavlak te verhoog. Daarna is Porter se benadering tot die mededingendheidsplatform, die dryfvere van mededingendheid en die fases in die ontwikkeling van mededingendheid ondersoek.

Die toepassing van nywerheidsbeleid in die praktyk is ondersoek met spesifieke nadruk op makro-ekonomiese beleid en die wyses waarop dit industriële mededingendheid kan beïnvloed, gevolg deur 'n studie van aktiewe en selektiewe inmenging en funksionele beleid. Die verkryging van tegnologiese kapasiteit, onderwys en opleiding en die verbetering van bestuurspraktyke in die bevordering van mededingendheid, is in besonder oorweeg en laastens is die beperkings van nywerheidsbeleid ondersoek. Dit sluit die gebrek aan duidelike doelstellings, onvolmaakte inligting, 'n gebrek aan vaardighede, onbuigsaamheid, die agentskapprobleem, belangegroepe en korrupsie in.

Hierna is die teorie van industriële ligging bestudeer aangesien die ruimtelike ontwikkeling van minder ontwikkelde gebiede 'n belangrike probleem van die Suid-Afrikaanse ekonomie is. Die tradisionele faktore wat die ligging van firmas bepaal was eerstens ondersoek en daarna is die moderne verklarings van liggingsbesluite bestudeer. Hierdie faktore fokus op agglomerasie en stygende skaalvoordele, 'n gespesialiseerde arbeidspoel, gespesialiseerde intermediêre insette,

vervoerkoste, historiese faktore en kennis- en tegnologies oorspoelvoordele. Daarna is ruimtelike ontwikkeling ondersoek met die fokus op praktiese faktore en die produksiklusmodel, fases in ruimtelike ontwikkeling en streeksontwikkeling deur die ontwikkeling van vervoerinfrastruktuur.

Hierdie studie benadruk individuele firmas aangesien dit in die eerste plek firmas wat teen mekaar meeding en nie lande nie. Die beleidsraamwerk waarin firmas funksioneer is 'n belangrike deel van die mededingendheidsplatform. Dit het 'n beduidende invloed op firma en Suid-Afrika se beleide en strategieë is in detail bestudeer. Aandag is gegee aan die historiese ontwikkeling van nywerheidsbeleid in Suid-Afrika tot by die aanvaarding van die *Geïntegreerde Nywerheidstrategie* in 2001 en die *Geïntegreerde Vervaardigingstrategie* in 2002. Die makro-ekonomiese konteks van industriële ontwikkeling in die land is ondersoek, gevolg deur 'n oorsig van die GEAR strategie Ruimtelike Ontwikkelingsinisiatiewe (SDIs), Nywerheidsontwikkelingsones (IDZs) en mededingendheidsbeleid. Daarna is die sleutelelemente van nywerheidsontwikkelingsbeleid in detail bestudeer.

'n Empiriese ondersoek is gedoen om die vlak van ontwikkeling van die Suid-Afrikaanse nywerhede se ontwikkelingsplatform te bepaal. Hierdie gedeelte van die studie het eers verskeie studies wat in die onlangse verlede oor Suid-Afrika se mededingendheid gedoen is geraadpleeg. Die potensiaal van die onderskeie provinsies om nywerheidskomplekse (clusters) te ontwikkel is ondersoek, skakeling en mededingendheid is geïdentifiseer en plaaslike mededingende voordele van verskillende streke en munispale areas is nagevors uit die Planning and Implementation Management Support System (PIMMS) databasis. Dit het 'n blik verskaf op die land se mededingendheid op 'n nasionale, provinsiale, streeks, nywerheids en plaaslike vlak. Besondere aandag is ook onder andere verleen aan die National Enterprise Survey en die Wêreldbank se opname oor die Groter Johannesburg Metropolitaanse Area en veral gefokus op die hindernisse vir mededinging.

Die hoofdoelstelling van die studie was die empiriese analise van 'n opname wat gedurende 2002 gedoen is oor die Suid-Afrikaanse mededingendheidsplatform onder vervaardigers. Daar is gevind dat alhoewel vervaardigingsfirmas in Suid-Afrika nie baie mededingend is nie die resultate wel beter was as wat verwag is, veral betreffende bestuursvaardighede, produkkwaliteit, tegnologiese hulpbronne en kundigheid. In die opname is die betroubaarheid en kwaliteit van kommunikasiedienste, water en elektrisiteitstoevoer en ander nutsbedrywe deur alle respondente baie hoog aangeskryf. In die studie is baie detail inligting verkry, soos byvoorbeeld die behoefte aan koelkamers wat vir baie vervaardigers probleme verskaf. Meeste firmas ondervind 'n tekort aan ambagsmanne en daar bestaan 'n behoefte aan meer opleidingsfasiliteite, veral vir beroeps- en nywerheidsverante opleiding. Respondente beskou hawe en oseaanvragfasiliteite as heeltemal

onvoldoende. Daar is ook gevind dat alhoewel afstand van die see 'n mededingende nadeel inhou vir firmas in die binneland, firmas wat naby lang kuslyne geleë is nie mededingende voordeel daaruit verkry nie. Dieselfde geld vir provinsies met groot lughawens. KwaZulu is die enigste provinsie wat hoër mededingendheid geniet weens sy hawens.

Swak persepsies van die owerheid en openbare dienste was die sterkste faktor wat mededingendheid benadeel het volgens alle respondente. Vervaardigers beskou staatsamptenare as ondoeltreffend, die staatsdiens as onwillig om hulp te verleen en die regering as onbevoeg. Nywerheidstandaarde, werkplekregulasies en -wette, as ook omgewingsbewaringswetgewing en riglyne word ook beskou as duur en meestal onvolledige n onduidelik. Daar behoort stappe geneem te word om die beeld van die regering en die staatsdiens te verbeter.

Die elemente van die mededingendheidsplatform in Suid-Afrika wat hindernisse veroorsaak en industriële ontwikkeling beperk kan opgesom word as:

- Lae menslike kapitaal
    - Veral lae produktiwiteit, motivering en werketiek
    - Onvoldoende beroeps- en nywerheidsgerigte opleiding
    - 'n Tekort aan ambagsmanne
- Oneffektiewe ondersteuningsdienste
- Swak persepsies van die owerheid
    - Ondoeltreffende en onbehulpsame staatsdiens
    - 'n Gebrek aan owerheidsondersteuning, inligting, hulp en insentiewe
    - Politiek een beleidsonstabiliteit
- Swak ontwikkelde tegnologie platform in sommige bedrywe, soos byvoorbeeld elektronika.
- Hoë kostes, belastings en rentekoerse
- Tekorte aan rou materiale; en
- Lae markvraag.

Daar is bevind dat mededingendheidsindekse van groot firmas hoër is as klein firmas vir alle sub-kategorieë. Groot firmas produseer beter kwaliteit en is superieur ten opsigte van strategie, struktuur, bestuur, en die benutting van verwante en ondersteunende nywerhede en instellings. Die produktiwiteitsindeks korreleer ook met firmagrootte.

Die mees mededingende provinsies is Noordwes, KwaZulu en Mpumalanga. Alhoewel Gauteng die meeste bydrae tot Suid-Afrika se BBP, is dit nie die mees mededingende nie. Die mededingendheidsplatform van die onderskeie provinsies openbaar elk unieke probleme, maar

die hierbo gemeld word deur almal ondervind. Die sub-kategorieë van die provinsiale mededingendheidsindekse kan 'n agenda vir ontwikkeling aandui. Finansies, bestuur en infrastruktuur verdien byvoorbeeld spesiale aandag in Gauteng, en plaaslike ekonomie, internasionalisasie en mense in Noordwes, terwyl die Weskaap behoort te fokus op plaaslike ekonomie, besigheidsdoeltreffendheid, internasionalisasie, infrastruktuur en menslike kapitaal. Limpopo, Weskaap en die Noordkaap het die laagste produktiwiteitsindekse en aandag behoort verleen te word aan die ontwikkeling van menslike kapitaal, wetenskap en tegnologie om effektiwiteit en produktiwiteit te verbeter.

In die studie van die mededingendheid van die tien hoof sub-sektore van vervaardiging is gevind dat die mededingendheid van die onderskeie sub-sektore min verskil. Mededingendheid van geen bedryfsektor was beduidend beter of swakker as die ander nie. Voedselverwerking en vervoertoerustingvervaardigers is mees mededingend. 'n Aspek wat aandag verdien is lae vlak van tegnologiese voortreflikheid, kundigheid en innovasie in die wetenskap- en tegnologiegebaseerde bedrywe soos chemikalieë en elektronika. Om in die nuwe ekonomie te oorleef moet die vlak van tegnologiese kapitaal, -kundigheid en -kapasiteit in Suid-Afrika beduidend verhoog word.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

This study investigates the competitive platform for industrial development in South Africa. The competitiveness platform is defined, following Porter (1998a), to be the elements in the South African business environment that determine the competitiveness of individual firms. These include demand conditions, factor conditions, firm strategy, structure and rivalry as well as related and supporting industries and institutions.

The structure of this chapter is as follows: First the problem statement and motivation for the study will be set out. Next a clarification of the basic terminology that will be used in the study will be given. This is followed by an overview of the structure of South Africa's manufacturing industries and the effect of globalisation. The chapter concludes with a description of the method of study and empirical analysis that will be conducted to evaluate and test the research questions.

1.2 PROBLEM STATEMENT

Industrial development is needed in South Africa to create employment and improve people's living standards. In order to achieve sustained growth and address the economic development challenges of the country, industries have to be internationally competitive. Industrial development needs investment in manufacturing. Whether or not South Africa will attract such investment will depend on the competitiveness and comparative advantage of the South African manufacturing sector. This emphasises the importance of a competitive "platform". This implies a business environment in which individual firms can achieve an expanding market share (see section 1.4 below).

According to Porter (1998:71), the competitive platform embraces all aspects relevant to competitiveness that enables firms to compete and industries to develop. The platform therefore includes all the relevant aspects of management, firm structure, conditions of input factors of

production and demand conditions, while it utilises related and supporting businesses and institutions. This foundation includes government policies, the quality of human capital, level of technology in the country and factors that enable firms to prosper and grow in future, amongst others.

The South African economy has microeconomic weaknesses that may hamper its competitive platform (Dobson, 2002:13). Some manufacturers possess expertise in modern techniques while others are still follow archaic ways, and many are inefficient. A need therefore exists to evaluate the competitive platform of South Africa and determine to what extend it can promote manufacturing development. It is important that such a study is being conducted to establish the points of strength in South African industries to build upon, but also weaknesses and facets that need attention to ensure sustainable industrial development.

1.3 RESEARCH QUESTION

This thesis intends to determine the state of South Africa's Industrial Competitive Platform. The research question is whether South Africa's competitive platform will be competent in promoting industrial development and enhance the ability of South African industries to compete on a sustainable and growing manner in the new global economy.

Specific questions that would be investigated include the following: What are the strengths and weaknesses of the competitive platform to support competitive industrialisation in the country and how proficient is the industrial competitive platform? How competitive is the level of technology, innovation, firm strategy and rivalry, human capital, resources, quality and supporting industries and institutions in South Africa? Which province has the most competitive industries? Where do the specific weakness and strengths lie in each province? Which sub-sectors of manufacturing is most competitive? Does firm size count in competitiveness, and what specific expectations and problems do various firms and sub-sectors experience?

In the following sections the terminology to be used will be clarified after which the remainder of this chapter will provide background to the rest of the study.

1.4 TERMINOLOGY

Industry: An industry is defined as a group of competitors producing products or services that compete directly with each other (Van Pletsen, 1990:18). The industrial sector are usually synonymously used to imply manufacturing, but it also includes support services and the term actually refers to manufacturing as well as mining, energy, water and the construction sectors.

Manufacturing: Manufacturing deserves special attention as it is seen as an engine of growth. Manufacturing entails the addition of value to resources, which are both raw products and intermediate goods from other producers and services. Industrialisation is a process whereby the share of added value contributed expands in relation to the secondary sector. It involves a key stage of economic development causing a structural shift in the economy from the high contribution of agriculture and mining in total output towards a position where manufacturing is increasingly responsible for a larger contribution to total output. The next stage in economic development is where structural changes lead the tertiary sector to increase its contribution to the gross domestic product. Eventually the service sector will contribute the largest share of GDP. Manufacturing will however remain an important sector in the economy, as it is one of the largest employers, with many linkages with other sectors. The fact that industrialisation is associated with rising incomes, is generally accepted (DTI, 1998: 14).

Manufacturing leads to:

- ***Economies of Scale and Scope***, yielding both static and dynamic returns and linkages to various other industries, increasing ***productivity*** and especially total factor productivity. The extension of the market for manufactured products would lead through the benefits of economies of scale to increased competitive advantage and economic growth.
- ***Externalities***. Technological externalities yield positive advantages where others can gain by freeriding, for example when everyone gains with investment in the human capital of workers by training. Pecuniary externalities operate through the price mechanism and arise when the profits of one producer affects the input and output levels of other producers. The value of manufacturing lies especially in the technological stimulatory effect, due to transmission through linkages in input and output flows. Industries with high linkages provide grounds for selective investment, as it will have a widespread impact on other industrial and non-industrial sectors. Industries such as leather, basic metals, food processing and clothing are conventionally accepted as examples of industries with high backward and forward linkages.
- ***Employment Creation.*** Manufacturing has important direct and indirect employment creation potential. Direct creation of jobs occurs where production increases to meet increasing local or export market demand. Indirect job creation occurs where increasing production in one industry causes job creation in other industries or sector through linkages. It is especially employment in the service sector that grows when manufacturing expands.

The manufacturing sector should be targeted for development to achieve the country's economic development goals and increase the living standards of people. As the manufacturing sector does not

always develop spontaneously, due to the asymmetry of information, lack of technology and other reasons, an effective industrial policy should be envisaged by the government, in collaboration with the private sector (DTI, 1998:14-20).

Manufacturing will receive special attention in this thesis, as it is an important sector in the economy, contributing about 24 per cent to the country's GDP (Barker, 1999:6). Manufacturing is one of the largest employers and has the important direct and indirect employment creation potential, with many links to other sectors. The fact that industrialisation is associated with rising income, is generally accepted (Ghatak, 1995:320 & IDC, 1998a:14).

Industrial Policy: Industrial policy refers to government's orientation towards the industrial sector. It can involve beliefs and views, the approach and intervention in the industrial sector, especially in the manufacturing that are aimed at enhancing those sectors or address market failures to ensure perfect functioning of the free market mechanism. Industrial policy is often employed as an instrument towards economic development (Suleman, 1998:76).

Trade Policy: Trade policy includes any policy, which *directly* affects the flow of goods and services between countries; it could involve import tariffs, import quotas and voluntary export restraints (Naudé, 2002:26). Trade policy is important in the study of industrial development as products are delivered with the aim to be sold. Promotion of trade in locally produced commodities will then also promote growth in the industries that produces those commodities. Authorities usually wish to promote trade and especially international trade as a way of enhancing economic growth and development of local industries (Hirsch & Hanival, 1998:37).

Strategic Trade Policy: Strategic trade policy refers to cases of advantageous protection when there are imperfectly competitive markets. The case of a foreign monopolist represents one such case. More specifically, the presence of imperfect competition implies that firms can make positive economic profit. Strategic trade policies typically involve the shifting of profits from foreign firms to local firms (Baldwin, 1992:804, & Leahy & Neary, 1999:447). In this way national welfare can be improved although it is often at the expense of foreign countries (Irwin, 1991:201 & Naudé, 2002:34).

Economic Development: Meyer (1995) defines economic development as: *"The process whereby real per capita income of a country increases over a long period of time - subject to the stipulations that the number of people below an 'absolute poverty line' does not increase, and that the distribution of income not become more unequal."* Economic development encompasses economic growth in a manner that is human centred and regards the development of human capital as a prerequisite for sustained development.

Competitiveness: Competitiveness indicates the ability to attract customers. Competitiveness is an indication of a firm's ability to capture market demand and especially the supply of other rival suppliers in the market. International competitiveness implies the ability to expand exports to foreign countries and capture their market demand (see Porter, 1998a:3-6 & 1990). Competitiveness can also be broadly defined as a favourable business climate. International competitiveness of countries is thus a broader concept than the competitiveness that exists between firms. When a product and its quality are superior to all others, absolute advantage exists, while comparative advantage exist if competitiveness holds when relative opportunity costs are taken into consideration. The US Competitiveness Council define competitiveness as *"the ability to produce commodities and services that meet the test of international markets while their citizens earn a standard of living that is both rising and sustainable in the long-run"*.

Competitiveness can also be defined narrowly on the ground of international cost and price competitiveness that are measurable by 'the real exchange rate based on relative unit labour costs. Competitiveness is often defined as the growth in productivity (Sunley, 2003:192). International cost and price competitiveness can also be measured by comparison of price or costs across countries in a common currency, which is the real exchange rate based on relative unit labour costs and productivity. Such a real exchange rate reflects international differences in labour productivity. Competitiveness measures based on unit labour costs are particularly useful for emerging economies that intend to increase their share of exported manufactures.

Globalisation: Globalisation is the process where markets and production in different countries are becoming increasingly interdependent in the trading of goods and services and the flow of capital and technology. This is due to the dynamics caused by modern technology, science and engineering that are knowledge and information based (Walker, 2003:505-509). The ever intensifying networks of cross border interaction in all domains of human activity: social, political, cultural, financial and economic are the main features of globalisation (Unido, 2000a:1).

Globalisation can also be defined in economic terms as the process by which markets and production in different countries are becoming increasingly interdependent due to the dynamics of trade in goods and services and the flows of capital and technology. The term globalisation refers to the growing volume of trade and foreign direct investment between countries and the creation of a global system of production through trans-national corporations (Rodrik, 1998:3 & Feenstra, 1998:31).

The New Economy: The new economy is a term referring to sustained growth in productivity with low inflation and low unemployment. Central to the rise of a 'new' economy is the fact that knowledge has become the most creative, value-adding factor in production, whereas in the old economy, land, labour and capital were the only factors of production. In the new economy the critical assets are know-how, creativity, intelligence and information. What characterises the new economy is that the

production of knowledge and information has itself become the leading branch of economic activity. Where the traditional economy obeys the general rules of diminishing returns, the new knowledge economy achieves increasing returns. Knowledge is a factor of production that does not diminish but rather increases its value upon use (Unido, 2000a:10).

Spatial Development: Spatial development refers to development placed in physical geographical context. Spatial development refers to the development of different geographical areas in a country. Spatial development deserves special attention in industrial development. Development could be between two growth nodes as a two-dimensional axis or multidimensional if more nodes and networks are included. Spatial development could also involve transportation routes and airways, and include virtual nodes and dimensions via computer and other communication technology.

The economic development challenges of South Africa require development to be fostered also within a regional perspective, to ensure that poverty is alleviated, economic growth induced and economic development optimally stimulated. If the development of the manufacturing sector occurs, it should be ensured that some of these new industries would also settle in the less developed regions of the country, in order to create employment, raise income and in this way enable people to brake out of the poverty cycle.

Various programmes have failed to adequately address spatial inequalities of South Africa in the past. It in fact contributed to the spatial misallocation of resources and had distorted the locational decisions of industries (Ligthelm & Wilsenach, 1993:361). Given the experiences with decentralisation policy and Regional Industrial Development Programmes, industrial development policy should be subjected to rigorous scientific scrutiny and thorough research. It is for the above-mentioned problems that this study will also have to study the extent to which policies and strategies will also promote regional industrial development.

New Economic Geography: The so-called 'New Economic Geography' is a field of study that focus on spatial economic development, with special attention to production management, marketing and innovation as factors determining spatial allocation of economic activity. The new economic geography emphasises the importance of the availability of skilled labour, intermediate inputs and technological spill-overs in the new economy.

The following section studies the structure of the manufacturing sector in South Africa to provide the background setting to this study.

1.5 PROFILE OF MANUFACTURING IN SOUTH AFRICA

This section studies the structure of South Africa's manufacturing industry as the most important representative of the industrial sector. The structure of the South African economy is considered in the first place, followed by an in-depth look into the specific manufacturing sectors, as it is important for the further development of the manufacturing industry and the building of a competitive economy.

1.5.1 *OVERVIEW OF THE SOUTH AFRICAN ECONOMY*

In this section the structure of the South African economy is studied. The characteristics of the country's economy during the last few decades are considered, as well as how the economy is currently structured. Low economic growth, a high and rising unemployment rate, high inflation and balance of payment problems were a feature of the South African economy since the early nineteen eighties. It is often maintained that the cause of the country's problems is due to the structural deficiencies of the South African economy. It is therefore essential to have a thorough knowledge of the structure of the economy when regional manufacturing development policies are constructed or evaluated.

1.5.1.1 Growth in Gross Domestic Product and National Income

The South African economy experienced economic growth rates equivalent to the best in the world during the 1960's, averaging 5.8 per cent. This decreased to an average of 2.2 per cent in the 1980s and turned negative during the early 1990s (Naudé, 2001:42 & SARB, 2001). After 1994 real income and production improved with an average growth rate of 2.7, but declined to 0.7 per cent with the 1997 crises in South Eastern Asia (SARB, 2001:148). Since then economic growth improved and South Africa grew at a rate of 3.1 per cent during 2000, generating a real GDP worth about R619 billion (SARB, 2001:1109). Due to structural rigidities this growth is below the six per cent required for South Africa to alleviate unemployment. The country's growth and development is restricted by a poverty rate between 39 and 53 per cent (World Bank, 1995) and an unemployment rate of 33.9 per cent (Stats SA, 2000:41), implying that between a third and half of the potential market in South Africa lies dormant.

The World Bank rate South Africa as an upper middle-income country, ranking the country 28th in terms of GNP. According to the World Development Report the country's economy is not very large compared to the developed West but in relation to African countries its GNP and economic growth is substantial (World Bank, 2001: 275). Between 1994 and 1997 economic growth was higher than the population growth and with declining population trends and the rising GDP it can be foreseen that this will also be the case in 2001 and immediate years to follow (SARB, 2001:S-148 & Stats SA, 2000:6).

In per capita terms economic performance in South Africa did worse. In relation to the rest of the world the World Bank rates South Africa 86th among 206 economies in terms of per capita GNP (World Bank, 2001:275). The economy grew by 3.1 per cent in 2000 but only 1.1 per capita indicating that the average wealth and living standards of the population is decreasing. Per capita growth in the 1960s averaged 3.1 per cent, decreasing to 0.8 during the seventies, reaching - 0.02 in the 1980s and improving to only 0.6 per cent during the 1990s (SARB, 2001:S-149).

1.5.1.2 Human Capital

South Africa has a population growth rate of 2.2 per cent (Stats SA, 2000:6), which undermines the standard of living and puts pressure on public expenditure. About 40 per cent of the population are children below the age of fifteen years and it is estimated that about 71 per cent of the population is living in the major metropolitan areas of Gauteng, Durban (Ethekwini), Cape Town and Port Elizabeth (Nelson Mandela Metropole) (Du Toit & Falkena, 1994:4). The urbanisation process has accelerated since 1980 and this migration towards the cities and metropoles has economic implications as the need for water, food, sanitation, transport, health, education, electricity and housing increases in the urban areas. It puts pressure on the government to spend more and increases informal economic activities.

The Human Development Index (HDI) for South Africa was 0.677 by 1991, which was an increase of nearly 21 per cent since 1980 (Whiteford, 1995:22), but by 1999 it was only 0.579 (UNDP, 2000:180 & Du Toit, 2001:2). Although this level of human development is not classified among the "high human development" countries, it is still the best among the African countries south of the Sahara (UNDP, 2000:159). This is however very far from ideal, especially if the rural HDI of 0.466 is compared to the 0.807 figure of the urban areas (Whiteford, 1995:22). This indicates that income, health and education levels in the country are still far from adequate. The country still has a life expectancy rate of 53.2 years and low rate of adult literacy and schooling and income distribution in relation to other industrialised countries (World Bank, 2001:277 & UNDP, 2000:159).

The asymmetrical distribution of income with a Gini coefficient of 0.65 implies that, of those employed, a large portion is also not earning substantial income to provide adequate market demand (Whiteford, 1995:21). Only 40.3 per cent of the population is economically active (CSS, 1995:7). The poorest half (50 per cent) of the people earns only 8.9 per cent of the country's income while the richest ten per cent of the population earns 50.1 per cent of the country's income (Whiteford, 1995:13). The asymmetrical distribution of income leads to a small savings and tax base. Although there are large differences in income between the different race groups in South Africa, there is also large inequality within race groups, especially among the Black population. Since the early nineteen seventies there occurred significant structural changes in income distribution within the various race

groups. An important cause of this was the decreasing population growth rate among Whites, while the numbers of other population groups still increased, and a decline in the wage difference between the various race groups since the seventies (Dornbusch, 1994:79).

The concentration of economic power, especially in the industrial sector, also causes unequal income distribution. Large companies like Anglo America, Sanlam and Old Mutual posses a large and increasing share of the total market capital on the Johannesburg Securities Exchange. This may also hamper the efficiency of the free market system in the process of creating wealth (Dornbusch, 1994:80).

South Africa has an unemployment rate of 33.9 per cent (Stats SA, 2000:40). The largest portion of unemployment in South Africa is structural. There is a significant mismatch between skills required and labourers' qualifications (Fourie, 2001:197). Youth illiteracy in South Africa improved from fifteen per cent in 1980 to ten per cent in 1997 (World Bank, 1999:84). Only 8.25 per cent of the population reached matric and only 3.19 per cent possess a tertiary qualification (SSD, 1995:45). The employment elasticity of economic growth equals 0.46. This implies that an average annual real economic growth rate of at least six per cent is needed to keep abreast of the increases of the labour force of 2.8 per cent per year (Naudé, 2000:56). Economic growth of 3.1 as has been experienced in 2002, will thus be inadequate to decrease the unemployment situation in the near future. Employment elasticity is also declining. South Africa is experiencing jobless growth due to capital-intensive mechanisation by producers and trade union problems. This is a worldwide phenomenon that also affects South Africa. South Africa, for instance, achieved economic growth averaging two per cent between 1980 and 1990 but employment only grew by 0.98 per cent (Loots, 1998:12). Demand for labour in the formal sectors of the South African economy fell further during 2000, in spite of the fact that economic growth is accelerating; but productivity is rising though.

The recognition of the previously black trade unions is seen as a major structural change that occurred in the late 1970s. Labour action increased significantly since the beginning of the eighties. The power of trade unions is an increasing problem as it forces wages up and causes instability in the economy. Severe labour unrest in the past all occurred during economic recessions (Dornbusch, 1994:85).

1.5.1.3 Natural Resources

Long-term economic development depends on the amount and quantity of a country's production factors: Labour, capital, entrepreneurship and natural resources. The lack of natural resources that constrain development in South Africa is the shortage of water, the absence of navigable rivers and crude oil, especially due to long transport distances. Only twelve percent of the country's soil is suitable for agriculture and rain is limited and variable (Dornbusch, 1994:58). South Africa is however able to produce surpluses and is the only African country which is self-sustaining and exporting food. The

long coastline also has potential for fisheries. South Africa is richly endowed in most of the minerals and will be able to produce for many years to come. The largest volumes of minerals produced are gold, coal and platinum. As mining exports provides large amounts of foreign currency, income and employment global fluctuations in commodity prices are a large source of volatility in the local market. Industrialised countries are moving away from manufacturing goods with a high mineral element towards microelectronics and services, utilising a high intensity of skilled labour and technology, thereby having a large impact on South Africa as a large exporter of minerals.

1.5.1.4 Sectoral Share

The primary sector in South Africa is characterised by sharp fluctuations in production from year to year, with growth rates like 3.3 per cent in 1994, -9.86 in 1995, 8.2 in 1996 and 1.61 per cent in 1997. Economic growth in 2000 was only 0.47 per cent in the primary sector (SARB, 2001:S-108). Varying climatic conditions influence agriculture, while mining production is steadily declining due to diminishing reserves and changing international prices for mineral products cause erratic growth in this sector (DTI, 1998:4).

By the end of 2000 real agriculture increased robustly due to higher maize and wheat production (SARB, 2001:6). Agricultural output fluctuates continually due to weather and market expectations the previous year. Mining output experiences a continual decline as rich deposits are exhausted. By the end of 2000 production volumes increased again due to the higher international price of metals and minerals and the stronger demand for diamonds and coal, however, the mining sector still showed a decline of about two per cent in 2000 (SARB, 2001:6 & Dept. of Minerals and Energy, 1997:6). The high rise in the gold price in 2001 and 2002 is expected to assist short-term growth in the mining industry.

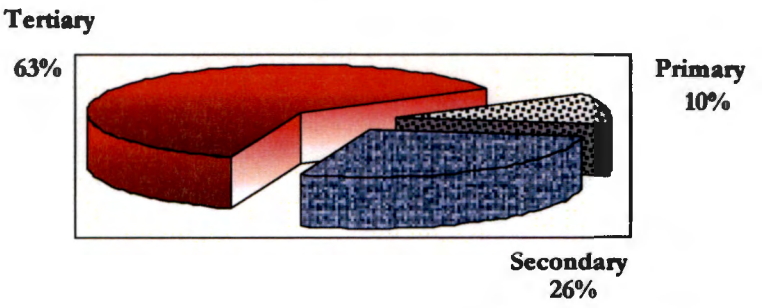
The secondary sector responded positively to the lifting of sanctions during 1993 to 1994. Manufacturing grew strongly in the years to follow as both local and export demand was strong. The implementation of the Reconstruction and Development Programme (RDP) also caused the water and electricity supply sectors to grow strongly. The growth rate of the manufacturing sector declined considerably since 1996, partly due to tariff liberalisation and weak local demand. As international producers increasingly contest the local market, local manufacturers are forced to target export markets to maintain their turnover. Several South African manufacturers have done so successfully and since 1995 manufactured exports have increased significantly (Hirsch, 1998:4). Operating margins in manufacturing is kept tight as raising international competition prevent them from passing cost increases on (SARB, 2001:2).

Following the emerging-markets crisis of 1998 there was no growth in real manufacturing output in 1999. After stabilisation of global conditions and greater competitiveness of local industries due to the

depreciating Rand, manufacturing output managed to reach four per cent growth by the end of 2000 (SARB, 2001:6). Equity capital raised in the primary share market almost doubled from 1999, reflecting also the raising levels of fixed capital formation in the private sector. Secondary share market activity was also buoyant as heightened price volatility encouraged investors and speculators to enter the market (SARB, 2001:3). Stronger export demand and increasing world growth does provide a certain degree of support to the economy's overall performance (IDC, 1998:2).

It can be seen on Figure 1.1 that the tertiary sector currently contributes 63 per cent to the GDP (SARB, 2001:S-108 & 109). The tertiary sector grew 3.34 per cent between 1994 and 2000, while the secondary sector achieved 2.2 per cent and the primary sector could only reach 0.12. This is an indication of economic development (IMF, 1997:215) and structural change is occurring in the economy (Hirsch & Hanival, 1998:6). Growth was also rather stable in the tertiary sector, varying between 2.8 and 4.5 per cent (SARB, 2001:S-107). A significant portion of the tertiary sector's business is with or dependent on the secondary sector and are thus effected by it with a lag of about one year. Growth in the tertiary sector declined in 1997 following the stagnation of the secondary sector in 1996, but increased continually since then. South Africa has a well-developed banking sector and trade in services and tourism is expanding. This leads to expectations of growth in the tertiary sector (DTI, 1998:4 & SARB, 2001:S-107).

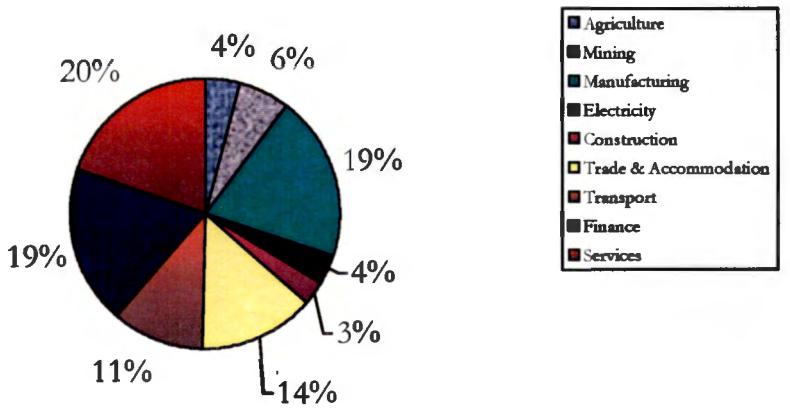
Figure 1.1 Sectorial Share



Source: SARB, 2001:S-108

By the end of 2000 real value added in the commercial sector rose by five per cent, while the catering and accommodation sector remained strong, underpinned by active tourism activity. The transport, storage and communication sub-sector grew 6.5 per cent, mainly due to the continuous expansion of cellular telephone and internet activity (SARB, 2001:7).

Figure 1.2: Kind of Economic Activity



Source: SARB, 2001:S-108

1.5.1.5 Kind of Economic Activity

Figure 1.2 shows the relative composition of the South African sectors by kind of economic activity. The largest contributor to the GDP in real terms is services. Community, social and personal services contribute 19.6 per cent to the national income. Financial intermediation including, insurance, real estate and business services contribute 19 per cent (in 2000). Manufacturing contributes 19.8 per cent, while wholesale and retail trade, catering and accommodation 13.9 per cent. As the share of the primary sector is declining, mining contributes six per cent and agriculture only 4.3 per cent (SARB, 2001:S-108).

Economic activity is mainly concentrated in the metropolitan areas. Gauteng contributes 45.9 per cent to the country's gross domestic product and about half of the country's manufacturing (DBSA, 1995a:117) (See section 7.5.8). The metropolitan areas around Gauteng, Cape Town, Port Elizabeth (Nelson Mandela Metropole) and Durban (Ethekwini Metro) produce about 80 per cent of South Africa's total manufactured products (Dornbusch, 1994:82).

1.5.1.6 Infrastructure

South Africa has a well-developed infrastructure, which forms the foundation of industrial development and facilitates economic activity. The country has 149 km of roads, 43 km of paved road and 19.3 km rail track per square 1000 km. During 1993 the country's ports handled more than 1.2 of cargo of neighbouring states (Du Toit & Falkena, 1994:12) and this grew to 170.2 million tons by 1998 (DoT, 2002:132). Except for the decline during 1998 due to the recession following the economic crisis in Southeast Asia, total cargo handled by South African ports grew constantly. The annual average rate of growth was 4.7 per cent during the 1990s, starting with 105.6 million tons in 1990/91

to 162.7 million tons in 2000 (DoT, 2002:86). The country supplies and consumes electricity output of 187514 GWh by 1998 (Stats SA, 2000:50) and it was estimated that it would be supplying 38.4 billion cubic meter of water (Du Toit & Falkena, 1994:12).

1.5.1.7 International Trade

South Africa is among the thirty countries with the highest international trade volumes. It has an open economy with exports equal to 23.3 per cent and imports 22.6 per cent of the GDP in 2000. The country's economy is even more open than that of the United States, Japan, Argentina and Brasil (SARB, 2001 & Dornbusch, 1994:55). This makes the country sensitive to changes in the international economy. Local variations in economic activity are usually related to the international economy. When an international economic downturn occurs, South Africa follows. Downturn in international demand, increasing prices, especially the oil price, and the depreciation of the Rand were major causes of the low growth rate in South Africa. During the first quarter of 2001 for example the Rand depreciated by 5.8 per cent and the Johannesburg All-share Index (ALSI) was down by 3.3 per cent. This was following the international trend, with the Dow Jones Industrial Average falling 8.4 per cent, the Financial Times Stock Exchange (FTSE) down by 9.4 and the National Association of Securities Dealers index (NASDAQ) down by 25.5 per cent (Gordon, 2001:1). Although the market favoured blue chip stock, growth, emerging and Information Technology (IT) stock are not, implying that investment funds for development are limited.

Exports of goods and services grew at an annual average of 16.5 per cent and imports by 13.1 in the 1980s. During the 1990s total exports dropped to 13.2 per cent and imports rose by 17.2 per cent having a negative effect on the current account. During 2000 exports increased by 25 per cent but imports also by 24.7 per cent. This trend resulted in a deficit on the current account since 1995 after a surplus of ten years. There was a net inflow of capital since 1994 following nine years of capital outflows. This softened the effect on the balance of payments, which only showed surpluses during seven of the previous twenty years. Since 1997 the balance of payments had a deficit every year (SARB, 2001:S-128). The continuous inflow of capital and the fact that South Africa always experienced positive growth in exports do however imply that the economy still has growth potential.

South African exports are dominated by sales in minerals, metals and related products (Dept. of Minerals and Energy, 1997:6). Like all less developed countries, the country is dependant on industrialised countries as an export destination and source of capital goods. Economic growth in South Africa is therefore also closely related to that of the industrialised countries (Dornbusch, 1994:74).

South Africa's imports consist mainly of capital and intermediary goods. This also implies high and rising capital intensity in the production processes of the country. Exports consist mainly of metal and

metal products and processed foods. This implies that the country is vulnerable for price and demand changes in international commodity markets. The world economy is moving away from mineral intensive production methods towards technology intensive production methods, which is founded on skilled labour instead of natural resources and this might harm the South African economy if the country is not developing its' own technology intensive production methods as well (Dornbusch, 1994:57).

Between 1945 and 1976, South Africa could generally afford to operate with a deficit on the current account of the balance of payments, which was about three per cent of the GDP, as these deficits were mainly financed by a net inflow of foreign capital. After 1976 the country experienced a net outflow of capital as well as structural change in the composition of capital inflows and investments in the public and banking sectors. Continuing deficits on the current account would lead to economic instability. This led to the debt crises of 1985 and until 1994 the country was forced to have considerable surpluses in the current account, holding local expenditure significantly below local production (Dornbusch, 1994:58). Since 1994 international trade with South Africa started to normalise. The country has a deficit on the current account since 1994, but capital inflows made up for that, realising a surplus on the country's balance of payments from 1994 until today (SARB, 2001:S-84).

1.5.1.8 Investment

Investment is the smallest component of gross domestic expenditure in South Africa but also the most volatile (Fourie, 2001:31). The growth in real gross fixed investment grew by 4.7 per cent between 1946 and 1962. This was followed by a period of rapid growth averaging 9.5 per cent between 1963 and 1975, and a period of negative growth between 1976 and 1993 when the real gross fixed investment decreased annually at an average of -1.5 per cent in spite of the high levels of investment that occurred between 1979 and 1981 (Dornbusch, 1994:67). Since 1994 real gross fixed investment grew at an annual average of 5.2 per cent after reaching 10.7 per cent during 1995 and ending the millennium with a growth rate of 1.3 per cent in 2000 (SARB, 2001:S-148).

Capital goods are a scarce factor of production in South Africa leading to large inflows of capital goods. Productions become more capital intensive since the nineteen sixties and this was also reflected in the capital output ratios as well as the marginal capital output ratios. During the nineteen sixties the capital output ratio averaged 1.6 per year and this ratio increased to 2.4 during the nineties (SARB, 2001:S-149). Although investment and growth had strengthened since 1994 the capital output ratio did not improve.

Capital inflows are relatively unstable and comprise mainly of portfolio investments. This is less beneficial to the economy than direct fixed investments as it does not lead directly to an increase in capital goods, production and employment. Portfolio investments do enforce a measure of

competitiveness though, ensuring that profitability is maintained by listed South African companies (Hirsch, 1998:8). Internal funds are still the most important source of investment funds for firms. With the new political dispensation in 1994 capital inflows started again reaching an average of one per cent to the GDP from 1994 to 1999. These international capital inflows were, however, largely of the portfolio kind, which can suddenly be subjected to reversals (Prinsloo, 2000:9). Foreign direct investment (FDI) is, however, also increasing steadily (IDC, 1998:3). For example, between 1996 and 1997 FDI increased threefold, (WEF, 2000:202).

Investments averaged an annual growth rate of 1.2 per cent between 1980 and 2000. During the 1980s investment grew at an average annual rate of 0.74 and 1.75 during the 1990s. Investment is the most varying component of aggregate expenditure in the country. In 1986 investments dropped by –18.6 and during 1996 investments rose by 10.7 per cent. Between 1994 and 98 there was a large inflow of investment funds (FDI) and investment grew at an annual average rate of 7.48 per cent, but it dropped to -0.6 in 1999 and could only reach 1.3 per cent in 2000 (SARB, 1994:S-103 & 2001:S-119). At the beginning of the third millennium fixed capital formation is growing at a vigorous rate, especially in the private sector, as producers and other supplies are expanding their productive capacities. Equity capital rose in the primary share market nearly doubled from 1999 to 2000 (SARB, 2001:1 & 3).

1.5.1.9 Savings and Consumption

Total private sector savings in South Africa demonstrated significant resilience in the long run. The average rate of private-sector savings has sustained higher levels in recent years than those attained during the 1960s when the general economic climate was far more conducive for savings. The composition of private savings changed due to taxation and inflation. Corporate savings now constitute a greater part of total private-sector savings than before (Prinsloo, 2000:31).

Gross savings in South Africa averaged 22.4 per cent of the gross domestic product annually between 1960 and 2000. The average savings rate from 1985 to 1999 dropped to 18 per cent, compared to 23.5 per cent in the period 1960 to 1972 and 25.4 between 1973 and 1984. The savings rate even reached 26.7 per cent between 1979 and 1984, although it was influenced strongly by windfall profits of gold-mining companies when the gold price reached exceptionally high prices in that period. Net domestic savings were 3.2 per cent of the GDP in 1997 and fixed capital consumption was 13.8 per cent. In the last decade of the millennium there was an apparent downward trend in the average savings rate. During this time national savings deteriorated significantly to an annual average of 16.3 per cent (World Bank, 1999:176).

From 1960 South Africa's savings ratio compared favourably with the rest of the developed world, but during the last decade of the previous century it was surpassed by nearly all those countries. In the

1990s South Africa's savings ratio deteriorated, while savings in other middle-income countries improved.

Final consumption expenditure by households in relation to the GDP average 60.5 per cent and increased to 62.9 during the nineties (SARB, 1994:S-130 & 2001:S-150). Between 1955 and 1979 about 89 per cent of the disposable income was spent on consumable goods and services. The ratio between consumption and personal disposable income experienced a large increase between 1986 and 1993, averaging 97 per cent (Dornbusch, 1994:66). This ratio of consumption to disposable national income averaged 82.2 per cent in the eighties but declined to an annual average of 60.1 per cent during the nineteen nineties (SARB, 1988:S-82 & 106; 1994:S-91,93 & 120; & 2001:S-106, 109 & 136). Between 1986 and 1993 there was a trend of higher consumption, lower savings and decreased investment. This trend has since turned around, savings is again rising mildly and investment figures are increasing (SARB, 2001).

In the South African economy the most stable component of consumption expenditure is expenditure on non-durable goods, while expenditure on durable goods is unstable (Dornbusch, 1994:67). The change in income distribution in favour of the poor is causing a larger portion of disposable income to be spent on non-durable goods like food and services during the last three decades (Fourie, 2001:16).

1.5.1.10 Inflation

During the nineteen sixties inflation in South Africa was of the lowest in the world, comparable to that of the industrialised countries, but this has drastically worsened during the eighties (Dornbusch, 1994 & SARB, 2001). South Africa experienced 25 years of double-digit inflation reaching 18 per cent in 1986, but this rate has fallen since the beginning of the 1990s. Between 1993 and 2000 the average CPI inflation rate was 7.3 per cent and by 2000 it was down to 5.3 , although it started rising again mildly by the end of 2000 (SARB, 2001:S-138). Production price inflation followed the same trend averaging 7.2 per cent during the same period, reaching 9.12 in 2000 (SARB, 2001:S-141).

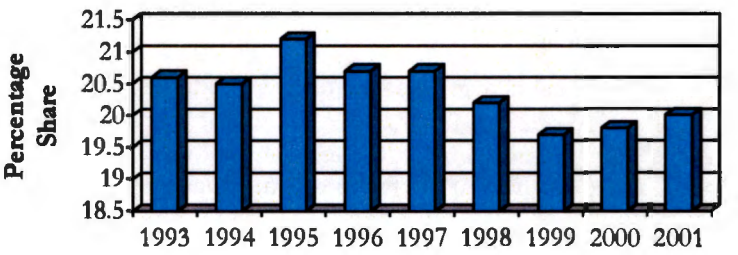
The preceding passages studied the structural overview of the South African economy. Next the focus will be set on the structure of the South African manufacturing industry.

1.5.2 STRUCTURE OF SOUTH AFRICAN MANUFACTURING

Manufacturing forms 75 per cent of the secondary sector and contributed 20.01 per cent to South Africa's GDP in 2001 as figure 1.3 indicates. The contribution of secondary sector to the GDP has remained relatively constant since 1980, and this also applies to manufacturing (SARB, 2001:107). The

foreseen trend of de-industrialisation that was to follow the reduction in trade protection did not materialise and is an indication of the sector's strength (DTI, 1998:6).

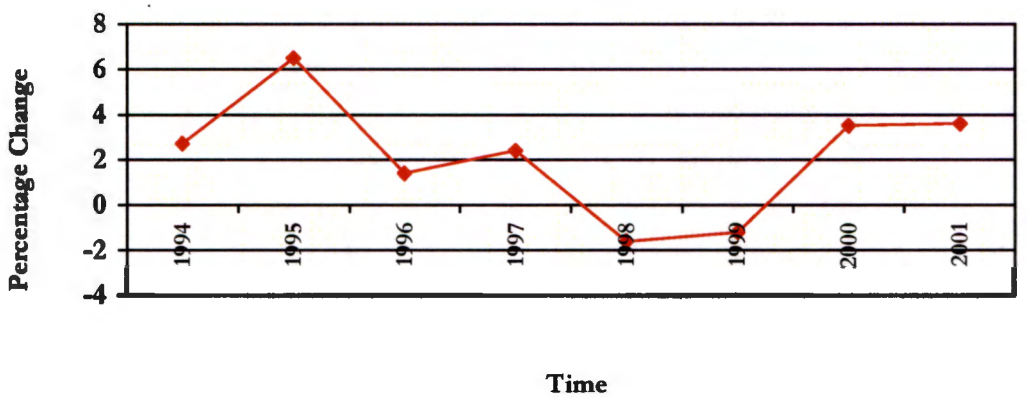
Figure 1.3
Share of Manufacturing in South Africa's GDP



Source: SARB, 2002:S-108

Figure 1.4 indicates that growth in real manufacturing output had been negative between 1995 and 1998. Due to the economic crises in Southeast Asia in 1998 deindustrialisation also occurred in South Africa and manufacturing growth declined to -1.6 but since 2000 positive growth rates were experienced in excess of three per cent (SARB, 2002:108) and by 2003 the trend is still persisting. Since 2000 as global conditions is becoming more stable and local companies became more competitive due to the depreciation of the Rand (SARB, 2001:5).

Figure 1.4
Growth of Manufacturing



Source: SARB, 2002:S-134

Capacity of manufacturing industries expands faster than other sectors. Between 1997 and 2001 it grew by 6.4 per cent, while agriculture only grew 2.5 per cent and mining only 0.81 . Financing, insurance and business services only grew by 5.2 per cent and Trade, catering and accommodation 4.4 during the

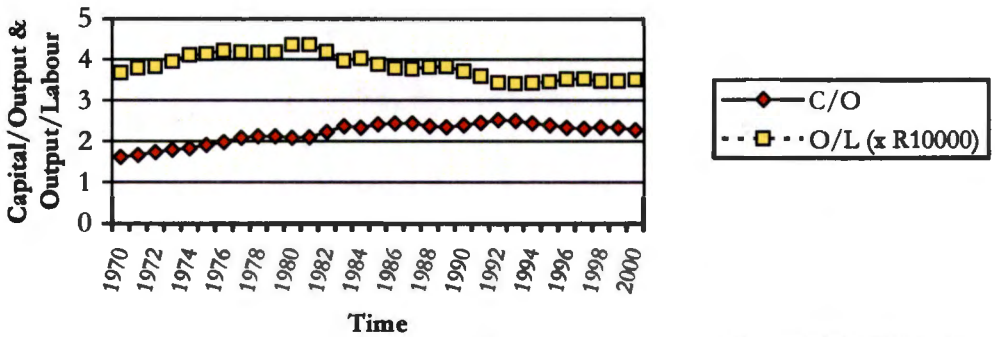
same period. A growing proportion of investment in machinery and equipment also reflects this (IDC, 1998:8).

The manufacturing sector in South Africa, in an African context, is large and relatively diversified in terms of production. The sector is partially dependent on imported intermediate and capital goods and external fluctuations, and the anti-export bias of the past had a direct effect on the sector. Since 1993 manufacturing experienced growth, although its performance weakened mildly in 1997 and 1998 but it still maintained its upward momentum (SARB, 2001:108). The increase in production was largely due to continued export demand as local demand was relatively static during the 1990s (Hirsch, 1998:9).

Growth in the total value added by the South African manufacturing sector has gone down since 1981, but has since begin to increase again after 1993, although the pre-1981 levels have never been achieved again. During 1980 the manufacturing industry grew by 11.08 per cent, the previous year was 9.3 per cent and 7.3 in 1978, but since then production found it difficult to experience positive growth rates of more than two to three per cent and was often negative. In 1988 and 1995 production also grew in excess of six per cent, but reached -4.57 in 1991. The growth rates since 1994 to 2000 averaged 2.1 per cent, however, and the general trend is positive. Although growth was often sluggish the general trend is raising production volumes that rose steadily in nominal and real terms and by 2000 real production was in excess of R112 billion. In nominal terms manufacturing produced R7 billion in 1977 and R148.8 billion by 2000 (SARB, Quarterly bulletin: several).

Economic development requires the capital output ratio to be as low as possible and decreasing (Ghatak, 1995:104). Figure 1.5 shows that the average capital output ratio in South Africa is steadily increasing mildly. The capital output ratio grew at an average rate of 0.64 per cent in the 1960s and this rose to about 2.5 between the 1970s and 1990s. Since 1993 this ratio declined, by a percentage of -2.15 during 2000. The average output to labour ratio that should have increased indicated a mild downturn, indicating low productivity. It could not rise in most years and shows a negative average growth rate of about one per cent for the 1980s and 1990s (SARB, 2001:S-149).

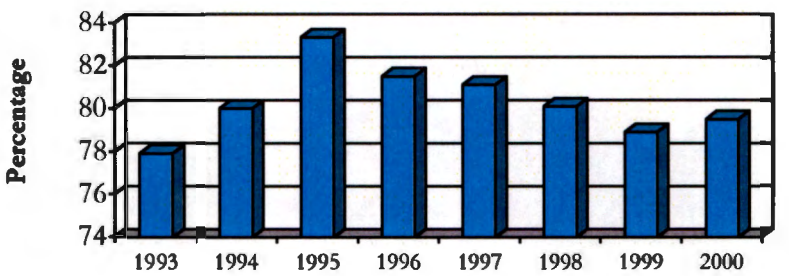
Figure 1.5
Capital/Output & Output/Labour



Source: SARB, 2001:S-149

The utilisation of production capacity remains about 80 per cent utilisation with little variation as shown in figure 1.6. During the 1970s utilisation levels were about 85 percent, decreasing to an annual average of 82.7 in the 1980s and averaging 80.4 per cent in the 90s. In 1977 capacity was filled to 87.6 per cent. Due to uncertainty it dropped to 77.9 in 1993 but rose again to 83.3 during 1995 and finished in 2000 at a level of 79.1 per cent (SARB, Quarterly bulletin: several). Utilisation levels of around 80 per cent are normal for industrialised countries (Hirsch, 1998:10). Manufacturers do not perceive a lack of skills and a lack of raw materials as a significant cause of under-utilisation. The main reasons given by manufacturers for the under-utilised capacity is a lack of demand. DTI regards new investments that enlarged the manufacturing sector as a whole since 1994 also as a factor as it increased supply (DTI, 1998:11).

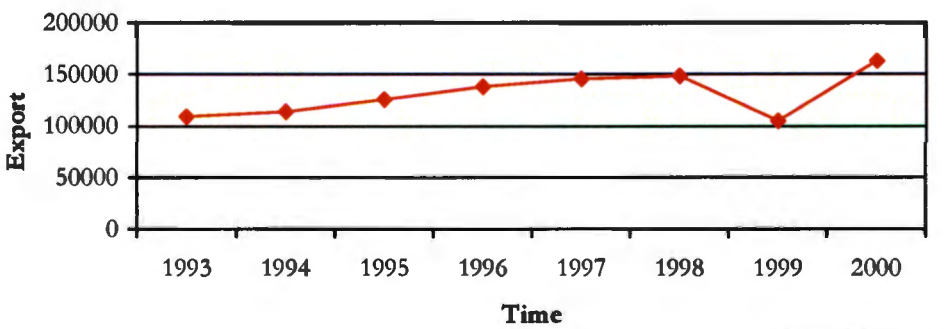
Figure 1.6
Utilisation of Production Capacity



Source: SARB, 2001:S-134

Export achievements were poor in the 1980s and this began to increase moderately in the 1990s as a result of a very expensive incentive programme as shown in figure 1.7. Since the new political dispensation in 1994, exports from South African grew every year at least ten per cent, but it finds it difficult to reach the growth rates of the 1980s. In contrast to other countries with a similar per capita income, the informal manufacturing sector in South Africa is very poorly developed due to policies of the past that tried to suppress informal activities (SARB, 2001)

Figure 1.7: Exports



Source: SARB, 2001:S-109

During the 1980s and 90s South Africa's manufacturing exports experienced positive growth rates, usually between six and sixteen per cent in current prices and an annual average of two per cent

Figure 1.8: Real Imports and Export of Goods
(R million)

(SARB, 2001:S-128 & various Quarterly Bulletins). Figure 1.8 illustrates the trends of exports and imports during the nineteen eighties and nineties.

Exports often increased during times when the exchange rate strengthened (DTI, 1998:11). Following the economic crisis in South Eastern Asia in 1998 exports only grew by 8.5 per cent the following year, but again achieved a nominal growth rate of nearly 25 per cent in 2000. The national export basket will become increasingly diversified as international trade with South Africa increases following the new political dispensation (IDC, 1998:3).

The negative consequences that were predicted following the restructuring of tariff protection, which started in 1995, did not materialise. The de-industrialisation that occurred in a number of developing countries succeeding tariff liberalisation in a number of developing countries, was prevented mainly by careful planning, segmentation and sequencing of tariff reforms (Hirsch, 1998:11). The devaluation in the South African currency since 1996 also helped to offset some of the ne **Source:** SARB, 2001:S-128 ff reforms and contributed to the relative stability of the manufacturing sector. The restructuring caused some employment losses but DTI belief that jobs will again be created by the restructuring as sub-sectors begin to find their niches of competitive advantage (DTI, 1998:12). In several cases this led to innovations that enhanced competitiveness.

Employment in the manufacturing sector was reasonably stable since 1980, but has begun to decrease. This is especially due to the fact that the services sector has begun to expand. Only the most capital-intensive companies could maintain their employment growth rates (Joffe, 1994:54). While manufacturing employment grew by an average of about 0.4 per cent in the 1980's, this could not be

continued in the next decade. During the 1990s employment diminished in every year, except 1994 and 1995, by an annual average of -2.12 per cent. Since 1990 employment figures decreased continuously until the turn of the millennium (SARB, Quarterly bulletin: several).

Labour productivity grew in excess of four per cent during most years and more than six per cent during 2000. On average annual labour productivity grew about 1.4 per cent during the 1980s and 3.2 per cent in the 1990s. During the same time the growth in unit labour costs declined steadily and is still falling, indicating an increase in labour productivity (SARB, 1994:S-115 & 2001:S-133). This signals structural adjustment in the economy and is an indication of economic development.

Stronger competition in local markets, mainly from abroad, is preventing local manufacturers and retailers to pass their cost increases forward, keeping their profit margins tight. By 2001 there is still some risk that the recent high rates of production price inflation might spill over into higher consumer price inflation (SARB, 2001:2).

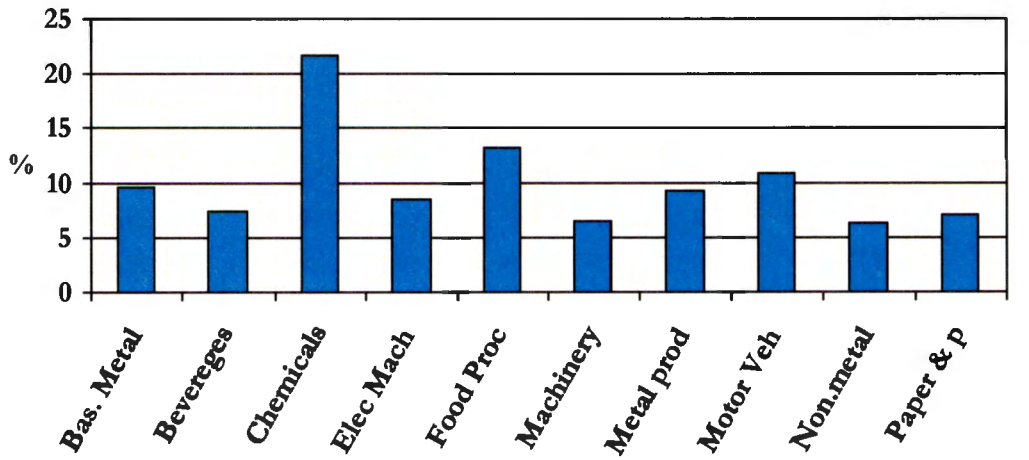
Significant variation in production and employment figures exist in various sub-sectors of manufacturing, which suggests that a restructuring and modernisation process has been underway during the 1990s. This restructuring led to movement of resources between and among sub-sectors, and according to the DTI this accounts in part for some of the losses in employment (DTI, 1998:10).

1.5.3 SECTORAL PROFILE OF SOUTH AFRICAN MANUFACTURING

Manufacturing in South Africa grew at a rate of 4.5 per cent by the end of 2000 and this expansion in output was experienced by most sub-sectors. Unfortunately there are some sub-sectors that lagged behind, like food, beverages and tobacco, clothing, textiles and leatherwear, and electronic equipment (SARB, 2001:6).

Figure 1.9

Sectors of Manufacturing



Source: IDC, 1998.

The chemical industry contains forty per cent of the country's total capital stock of manufacturers. The combined share of the labour-intensive clothing and shoe industries is only 0.6 per cent. Between 1970 and 1990 the capital stock of the clothing industry fell by about 40 per cent. The total factor productivity also went down by an average of 1.02 per cent between 1972 and 1990 (Joffe, 1994:53).

As indicated by in figure 1.9 the largest manufacturing sub-sector is chemical products. Chemicals contribute 3.97 per cent to the GDP and 16.64 per cent of manufacturing production. If added together, all metal products are the second largest sub-sector, adding 3.95 per cent to the GDP and 16.55 to manufacturing. Comparing sub-sectors, food processing is the second largest contributing 10.2 per cent to manufacturing, followed by motor vehicles and components (8.34%), iron and steel basic industries (7.25%), metal products (7.04%), electrical machinery (6.45%), beverages (5.83%), pulp, paper and paper products (5.32%), machinery (4.86%), and non-metallic mineral products (4.82%) (IDC, 1998).

Up to seventy per cent of the manufacturing industry's output is either resource or scale intensive, while only sixteen per cent is labour-intensive. The largest firms create very few new job opportunities. South Africa's productivity has the potential to increase because of the relatively cheap resources and energy, and possible scale benefits (Naudé, 2001:260).

In the following paragraphs the structure of the most important manufacturing sectors in South Africa are described. The Industrial Development Corporation (IDC, 1998e) served as the main source of information.

1.5.3.1 The Chemicals Sector

The *Chemicals sector* contributes four per cent to the GDP and utilises three per cent of the economy's fixed capital stock. In 1996 it produced products with a value in excess of R74 billion and experiences annual growth of about four per cent. Local manufacturers demand about 57 per cent of the chemical sector's production for intermediate usage. Agriculture, transport and mining are the largest consumers outside of the chemical sector itself. Sales to the plastics, fabricated metals and building industries are also considerable. Household demand accounts for 28 per cent of total chemical sales and pertains largely to petroleum consumption. Nonetheless consumption also forms a large proportion.

The USA, Zimbabwe, Spain, Mozambique and the Netherlands are the chemical sector's principal export destinations. Exports claim 14.5 per cent of total sales, and an average annual rate of 8.6 per cent from 1991 to 1996 was experienced and the trend is persisting. Petroleum products, basic chemicals and fertilisers account for 81 per cent of overall chemical exports.

As part of its competitiveness drive, the sector is currently intensifying technological research and development and is one of the major beneficiaries of government's programmes. It is utilising new computer-aided technologies and implementing total quality management to enhance efficiency.

The *chemicals sector* is not a very large employer and has exhibited a declining employment trend in recent years due to its capital-intensive nature and a continuous substitution of labour by capital. By 1996, the chemicals sector provided employment to 1.7 per cent of the national labour force (IDC, 1998:15.1-15.39).

1.5.3.2 Food Processing

Food processing contributes 2.4 per cent to the GDP of the South African economy, and 3.2 per cent of the total exports. Food processing accounts for 4.1 per cent of total imports and 2.6 per cent of total employment in the county. The sector consists of eleven downstream agriculture sub-sectors, namely: meat processing; dairy products; preservation of fruit and vegetables; canning and preserving of fish; vegetable and animal oils and fats; grain mill products; bakery products; sugar mills and refineries; cocoa, chocolate and sugar confectionery; other food products; and prepared animal feeds. Meat processing is the single largest food sub-sector, contributing one quarter of total food production, followed by the grain milling (13%) and animal feeds sub-sectors (10%).

Local food production is primarily intended for the local market, with private households accounting for the largest share of local sales of up to 90 per cent of sales. The exception is animal feeds, which sells most of its produce to the agricultural sector. Demand trends are dominated by growing private consumption expenditure and tend to be stable. The food-processing sector's main intermediate clients are agriculture, catering and accommodation and the animal feeds sub-sector.

Food exports was boosted by the deregulation of the local industry, the opening up of international markets for South Africa, depreciation of the Rand and relatively low local inflationary pressure. In total, only eight per cent of food production is destined for the export market. Exports by the food-processing sector did, however, experience annual growth rates of about ten per cent annually since 1998.

The largest share of the food export basket is attributable to the sugar-milling sub-sector, which accounted for almost 38 per cent of total food exports in 1996. Prepared and preserved fruit and vegetable products contributed just over 19 per cent to the sector's export earnings, followed by meat products with a fourteen per cent share. The top exporting destinations for South African processed food exports are the United Kingdom, Mozambique, Germany, Japan and the Netherlands, which accounts for about a third of the total exports in 1996.

Primary factor costs represent 22 per cent of the food-processing sector's total costs and the capital-to-labour cost ratio is 1 to 1.2 . Most of the food processing sub-sectors are very labour-intensive but large investments also have to be made to obtain the appropriate machinery and equipment to process basic agricultural inputs. Over the period 1991 to 1996 employment in the food-processing sector declined on average by 2.3 per cent annually.

The import penetration ratio was 10.2 per cent in 1996. Some sub-sectors do, however, encounter stronger competition from imports. The canning and preservation of fish and animal oils and fats sub-sectors experienced import penetration ratios of 25 and 30 per cent respectively. It is also expected that these ratios will increase even further in the near future.

The process of deregulation and liberalisation has raised competitive pressures, which in turn, have accelerated the restructuring of the food processing industries. Considerable improvements in productivity were accomplished in an increasingly competitive environment with reducing tariff. This led to new investments within the sector. Between 1994 and 98 more than R3.8 billion in foreign investment have flown into the food and beverages sectors. South Africa's food sector faces unique challenges. Lower tariffs and freer trade have forced sectoral players to become more competitive, whilst consumers are demanding better quality (IDC, 1998:4.1-4.50).

1.5.3.3 The Motors Vehicle and Vehicle Components Sector

The Motors Vehicle and Vehicle Components Sector contributes two per cent added value to the South African economy and offers more than one per cent to total employment. In this sector motor vehicles form 60 per cent of the sectoral output and are the major client of the motor vehicle components sub-sector.

The Motor Industry Development Programme (MIDP) aims at the development of the sub-sectors of light vehicles, original equipment and vehicle component manufacture. Phase VI of the local content programme encouraged the rapid expansion of *Botswana* exports and placed increasing competitive pressure on the components industry. The MIDP facilitates the industry's phased integration into the global automotive industry, by means of measures aimed at increasing the volume and scale of production through the expansion of exports, a phased reduction of government assistance and gradual rationalisation of the industry.

The reduction of import tariffs is gradually reducing governmental assistance to the industry. Consequently, the motor industry is facing increased competition from abroad. High levels of import penetration are experienced by all sub-sectors, averaging almost 36 per cent for the sector.

Motor vehicles and components are mainly produced for households and investment, each representing around 25 per cent of total sales, the remainder being intermediate output. During 1996 the export propensity of the sector was eleven per cent, with the main export destinations being Europe and Southern Africa. Exports have been a major driving force within this sector's expansion. Between 1991 and 1996, exports of motor vehicles and motor vehicle components grew at a real average annual rate of 18 per cent, and by 1996 this sector already supplied 2.17 per cent of the country's total exports.

Automotive components are a large sub-sector in itself growing at about six per cent annually. In 1996 components production was more than R11 billion and exporting between two and seven billion Rand annually. This sub-sector's export propensity is relatively high at 19 per cent in 1996 and is still rising.

The Motors vehicle and components sector obtains most of its intermediate inputs from the motor vehicle parts sub-sector (40%), while iron and steel is the second largest source of intermediate inputs (4% of total costs). Total primary factor costs represented 35 per cent of sectoral costs in 1996. The sector is relatively capital intensive. Measured by the value-added component of capital contributing 19 per cent versus the 16 per cent of labour. Employment growth has been negative at an average annual rate of -0.7 per cent between 1991 and 1996 (IDC, 1998:24.1-24.13).

1.5.3.4 The Iron and Steel Basic Industries

The Iron and Steel Basic Industries contribute 1.73 per cent to the South African GDP. It accounts for one per cent of total employment and contributes 9.04 per cent to total exports. World steel consumption is dependent on the world economy and the same applies in South Africa. South Africa consumes about four million metric tons of carbon steel per year, which accounts for almost 30 per cent of Africa's consumption and 0.6 per cent of world consumption. Local demand for steel is strongly related to the general GDP growth trends.

This sector covers the manufacture of primary iron and steel products, which involve all processes from smelting in blast furnaces to the semi-finished stage in rolling mills and foundries. The most important product groupings are carbon steel and stainless steel. Carbon steel accounts for about 97 per cent of the sector's output.

During the past 40 years this industry has been one of the main pillars of economic growth in the South African economy. South Africa is a natural producer of steel due to its wealth in the required natural resources such as iron ore, manganese, coal, chrome and others. The basic iron and steel sector provides the link between the mining of ore and the manufacture of final metal products.

The largest consumers of carbon steel in South Africa are the new vehicles industry, the building and construction industry, and capital expenditure in manufacturing. The metal products industry, that

produces consumer and investment goods, utilises about a quarter of the carbon steel production, while a further sixth is used in residential construction.

Specific local market uses of stainless steel include food processing, tableware and bulk containers. The penetration of stainless steel into the carbon steel market grew from one per cent in 1984 to more than two per cent in 1996 and the trend is expected to continue.

The *Iron and Steel Basic Industries* are a significant generator of foreign exchange, due to the high international demand. Increased specialisation worldwide also underlies the rising ratio of exports to steel consumption. The principal export destinations in 1996 were the USA (13.2%), Japan (11.1%) and Taiwan (8.2%). Ferro-alloys, various types of flat-rolled products, and certain angles and shapes are the most important export products. South African primary steel producers also provide financial assistance to exporters of secondary steel products if such downstream producers add at least 25 per cent of value. In accordance with the commitments to the WTO, import tariffs of the iron and steel industry are set to decline to 2.6 per cent on an import weighted basis, from a level of 4.7 per cent in 1994.

Competitiveness of the South African *Iron and Steel Basic producers* are enchanted by their ideal placement along the world cost curve. This favourable cost position is based on low resource costs rather than manufacturing efficiency. The independence from imported raw materials provides a built-in measure of protection against currency depreciation.

South Africa's carbon steel is produced by Iscor, which produces 80 per cent of the total production, Highveld Steel (9%), Scaw Metals (6%) and Davsteel (5%), with a combined annual capacity of about 9.6 million tons. Saldanha Steel is a joint venture by Iscor and the IDC that add 1.2 million tons of hot-rolled coils to the country's annual production. Saldanha Steel is expected to become one of the top ten most cost-efficient producers in the world. Columbus Stainless is the major primary producer of stainless steel producing 235 000 tons by 1996, and production is expected to increase in future (IDC, 1998:19.2-19.6).

1.5.3.5 The Metal Products Sector

The Metal Products Sector is diverse sector which products are used in most of the other economic activities. The major sub-sectors are: structural metal products, which accounts for 58 per cent of the sectoral output; cutlery, hand tools and general hardware; furniture and fixtures of metal; and other fabricated metal products (32%). The *metal products sector* contributes 1.7 per cent to South Africa's GDP, 4.2 per cent of the countries exports and 2.36 of imports.

Twelve per cent of total sales go to household consumption, mainly from cutlery, handtools and general hardware, and metal furniture and fixtures of metal sub-sectors. Metal products are primarily used as intermediate and investment inputs in the production of other goods and services. About 42 per cent of total sales go to intermediate demand, whilst investment demand receives 19 per cent, while the largest share of structural metal products (6%) goes to the construction industry.

Most *Metal product* exports go to Zimbabwe, the USA, Britain, Mozambique and Zambia. Exports from this sector grew by an annual average of 10.5 per cent from 1991 to 1996, and the sector's export propensity rose to just over 27 per cent by 1996. The sub-sector producing other fabricated metal products accounted for almost 80 per cent of the sectoral export basket in 1996, followed by the structural metal product sub-sector with a twelve per cent share.

The competitive advantages presented by the upstream sectors provide opportunities for the *metal products sector* to take advantage of its higher value-added capabilities to increase its competitiveness. A share of 32 per cent of the total input costs of the *metal products sector* goes to the basic iron and steel and basic non-ferrous metals sectors indicating a large linkage to upstream industries. The potential competitive advantages is however lost due to certain supply practices that these upstream industries follow, like import-parity pricing, which often translate into uncompetitive costs of raw materials.

Advantages in the production of raw materials are unfortunately not always passed on to downstream producers, whether in terms of price, quality or service. Conversion efficiencies could also be improved, which can build on South Africa's relatively low unit labour costs through continuous investment in technology, development of skills and innovation. High transportation costs to international markets still need to be addressed.

About 37 per cent of the *metal products sector's* costs are primary factor costs. Labour claims a 23 per cent share of the costs and capital costs fourteen per cent. This implies that the *metal products sector is* relatively labour-intensive. The *metal products sector* is an important creator of employment in South African. Benchmarking studies have, however, revealed that most metal product operations are overstaffed and utilise outdated capital equipment. Pressures to improve local competitiveness in the global context cause job losses, upgrading of technological and higher capital intensity (IDC, 1998:21.1-21.23).

1.5.3.6 The Sector for Electrical Machinery

The Sector for Electrical Machinery is diverse, with regard to its product range and the nature of its markets. The sector consists of the electrical industrial machinery sub-sector contributing 31 per cent to the sector; radio, television and communication equipment (26%); electrical appliances, houseware and small appliances (3%); and other electrical apparatus (40%). Demand for the sector's products varies

from the completely final-consumption to investments. Private consumption accounts for eight per cent of total demand, with purchases consisting mainly of small electrical appliances as well as radio, television and related equipment.

The *electrical machinery sector* experienced difficulties during the 1990s. The most important customers locally are the telecommunications activities of Telkom and previously the SA Post and Telecommunication Service, the supply of electricity by Escom and defence spending. The level of demand from the public sector has, however, dropped significantly.

The intermediate usage of electrical equipment by other industries, as part of other equipment or machinery and by building and construction, forms an important part of local demand. The restrained level of building and construction activity since the early nineties has resulted in a considerably lower growth rate of the electrical machinery sector. This sector also faces a significant degree of "grey" and illegal importation.

The *electrical machinery sector* produces 1.54 per cent of South Africa's GDP, 1.02 per cent of the country's exports, demands 10.63 per cent of the country's total import expenditure and utilises 1.51 per cent of the labour force. From 1991 sectoral employment grew at an annual average of 2.3 per cent. The production processes of the sector are mainly labour-intensive, although mechanisation is rapidly being introduced in some areas of production, particularly in assembly operations (IDC, 1998:23.1-23.23).

Exports from this sector are low due to the inability of local manufacturers to become internationally competitive. Sectoral imports are however significant due to the high levels of technology required in this industry. Growing at an annual average rate of about 19 per cent since 1991, exports represented thirteen per cent of total sales in 1996. The most important export products are telephone communication apparatus and electrical cables. Policy changes have also persuaded local companies to enhance their competitiveness and direct their focus towards foreign markets. The principal export destinations are Zimbabwe, Britain and Germany.

In the sub-sector producing electrical appliances and houseware, exports account for almost half of total production. All the other sub-sectors of the *electrical machinery industry* do, however, exhibit a low export propensity. A number of "hidden" electrical and electronic components are however exported as part of assembled machinery and equipment that is not classified under this sector.

The *electrical machinery sector* does comprise of more than a thousand enterprises, but the sector is dominated by a number of large international as well as local companies. Local industry supplies about

38 per cent of the local requirements, with the balance being imported. This confirms South Africa's low world ranking of production-to-consumption ratios.

The *electrical machinery sector* is highly technology-driven and, due to increasing globalisation and openness of the South African economy, local firms now have to compete with global leaders in technology. This causes local manufacturers in some product categories to be confined purely to assembly, while the basic components are imported from international suppliers.

South Africa is, however, in many branches of technology at the forefront; including security apparatus, power metering and some telecommunication and television decoding equipment. Technological advancements by the local industry have largely been stimulated by Telkom, Escom and Armscor procurement. The drastic shrinkage of this demand component in recent years, together with increased international competition has resulted in the downsizing of the industry.

1.5.3.7 The Beverages Sector

The malt and malt beverages sub-sector dominate the *Beverages Sector*, accounting for almost half of the sectoral production. Other important sub-sectors are distilleries and wineries (31%) and soft drinks (21%). The whole *beverages sector* contributes 1.34 per cent to the South African GDP, but employs less than 0.5 per cent of the total work force. The shares of exports and imports are relatively low, at 0.9 per cent and 0.6 per cent of the national figures, respectively.

Private households consume 57 per cent of the production of beverages. A third of the production is sold to other industries, especially the catering and accommodation sector. The beverages industry enjoys a relatively stable long-term growth in local demand due to increasing income levels.

Less than nine per cent of total sales are exported. The distilleries and wineries sub-sector has an export propensity of 17 per cent. Exports of South African wine have been significant. In 1996 it accounted for more than 60 per cent of total sectoral exports. The largest export destinations for bottled and bulk wines are Brazil and Britain. Next to Australia, South Africa is the largest exporter of wine to Britain. Although only three per cent of malt and malt beverages are sold on the export market, this sub-sector has experienced significant export growth, especially to African countries.

The *beverage sector* consists of well-organised corporate groupings, which operate to a large extent in monopolistic environments. High barriers to entry exist. The *beverage sector* includes divergent markets and production structures. The wine industry is, for example, strongly linked to the agriculture sector and comprises a large number of small producers, whilst the beer and soft drinks sub-sectors are vertically integrated and are dominated by only a few suppliers.

High import tariffs, coupled with international licensing and distribution agreements, have successfully protected the beverages industry from imports. The import penetration ratio for the sector is 6.1 per cent and imports of soft drinks are virtually non-existent (IDC, 1998:5.1-5.17).

1.5.3.8 The Pulp, Paper and Paper Products Sector contributes

The Pulp, Paper and Paper Products Sector contributes 1.27 per cent to South Africa's GDP, 2.9 per cent of the country's exports and 1.7 per cent of the total imports. The pulp, paper and paperboard sub-sector dominate the sector by supplying about 61 per cent of the total sectoral production and is the principal supplier of raw materials to the other sub-sectors.

The *pulp, paper and paper products sector* sells 73 per cent of its output to other industries for intermediate usage, five per cent to private households, and the remaining 22 per cent in the export market. Demand for paper containers and paper substitutes sub-sector is most stable and largely determined by the level of local industrial activity. Demand for these paper containers and paper substitutes are mostly of an intermediate nature, especially for the packaging of agricultural, food and industrial products, and this sub-sector has therefore closer links with these industries. Household consumption plays a significant role in the demand for other pulp and paper products.

South Africa's *pulp, paper and paper products sector* has established itself as a significant and competitive agent in the global market. The pulp, paper and paperboard sub-sector is the most export-oriented and accounts for about 91 per cent of sectoral exports, which implies that this sub-sector is relatively exposed to global market trends. Although South African companies dominate certain paper grades in the international market, the sector is vulnerable to market and exchange rate fluctuations.

The *pulp, paper and paper products sector* is dominated by a few large companies like Sappi and Mondi. Most paper mills are located near South Africa's forestries, mainly in KwaZulu Natal and Mpumalanga. A few mills are also found in Gauteng, which are increasingly utilising recycled fibre and purchase pulp from other mills.

Import penetration ranges from 44 per cent in the sub-sector producing other pulp and paper products to 0.7 per cent in the sub-sector producing paper containers and paper substitutes. In total, sectoral production caters for about 85 per cent of the local requirements.

South Africa offers hosting conditions, which are advantageous in terms of costs of raw material, labour, energy and transportation costs per kilometre. Material inputs originate mainly from the pulp, paper and paper products sector itself amounting to 22 per cent of total costs, from basic chemicals (6%) and from the special machinery sub-sector (5%). Capital costs represent 21 per cent of the total cost structure and labour inputs only thirteen per cent, a rather capital intensive sector. This is due to

the fact that most production processes generally require large plants and machinery. The sector only utilises 0.71 per cent of the country's workforce.

The *pulp, paper and paper products sector* is linked to forest resources of upstream industries. In the global environment the downstream paper chain functions efficiently and is relatively exposed to global competition. Sappi and Mondi also own pulp and paper operations in the USA, Brazil and Europe. Through its acquisitions in both the USA and Europe, Sappi has become a world leader in coated papers (IDC, 1998:13.1-13.20).

1.5.3.9 The Machinery Sector

The *Machinery Sector* produces 1.16 per cent of South Africa's GDP, 2.84 per cent of the country's exports compared to the 18.7 per cent of the country's imports. Such a large share of the import basket is typical of a less developed country and is necessary for the expansion of the country's production capacity and future growth.

The *machinery sector* is dominated by the diverse sub-sector called "other machinery", which accounts for 46 per cent of sectoral production. Second is the special industrial machinery sub-sector producing 39 per cent of sectoral output, followed by the engines and turbines sub-sector (7%); metal and woodworking machinery (5%); agricultural machinery (2%) and office and accounting machinery only one per cent.

Bell Equipment, Barlow Equipment Company and Boart International are of the largest companies in the South African *machinery sector.* Products from the *machinery sector* are mostly used as capital or intermediate inputs by other economic sectors. The sub-sectors for agricultural machinery, metal and woodworking machinery, and office and accounting machinery are largely exported. Engines and turbines are mostly used as an intermediate input into other machinery sub-sectors, while sales of the special industrial machinery and other non-electrical machinery sub-sectors are principally directed toward their private investment expenditure.

South African machinery remains relatively uncompetitive in the international marketplace, both in quality and price. Exports are mainly to Zimbabwe, Germany, the USA, Zambia and Britain. New destinations such as Brazil and Australia account for smaller shares of sectoral exports. The main exporting sub-sectors are generally other non-electrical machinery, which accounts for 40 per cent, special industrial machinery (26%) and the metal and woodworking machinery sub-sector (20%).

The *machinery sector's* main cost components are intermediate inputs, such as iron and steel, engines and turbines, and other metal products. The sector has s labour to capital cost ratio of 20:6 . This implies that the sector is highly labour-intensive. The *machinery sector's* employs 1.15 per cent of the country's

workforce. Wage disputes, low productivity and shortages of trained technical staff have unfortunately forced the industry to reduce its labour intensity over time. The machinery sector relies on high levels of technology to produce internationally competitive products, and this causes a move towards higher capital intensity.

South Africa, like all less developed countries relies on the imports of machinery or capital goods, especially those of a highly specialised and technology-intensive nature, in order to expand its productive capacity. The machinery sector's import penetration ratio was about 60 per cent in 1996, and is increasing due to declining tariff levels. Most of the sector's imports originate from Germany, the USA and Britain. Significant import volumes are recorded in the special industrial machinery, other non-electrical machinery and office machinery sub-sectors. Higher investment risk and import competition causes an under-utilisation of production capacity in the machinery sector (IDC, 1998:22.1-22.30).

1.5.3.10 The Non-Metallic Mineral Products Sector

The *Non-Metallic Mineral Products* sector adds 1.15 per cent to South Africa's GDP. Exports and imports are relatively low, as the high-bulk and low-value nature of many of the sector's products makes cost-effective transportation difficult. The sector exports only 0.59 of the country's production while imports form 1.31 per cent of the economy's total importation.

The glass and glass products sub-sector produces 23 per cent of the sectorial output; structural clay products also 23 per cent; pottery and cement manufacturing 22 per cent; and china and earthenware only two per cent. The largest part of the *non-metallic mineral products* sector (30%) is produced by the general sub-sector that consists of all non-metallic mineral products not classified among the previous four sub-sectors mentioned. This sub-sector includes products of concrete, gypsum, asbestos, plaster, slate products and abrasives.

The *non-metallic mineral products* is highly dependent on activities in the building and construction industry, while a large portion of the glass sub-sector's output is supplied to the beverage and motor vehicle industries. Consumer demand accounts for only five per cent of total demand for the sector's production.

Low demand for building materials and glass products has emanated from the substitution by plastics or other alternative building materials. The scope of this substitutability is fortunately limited, as conventional non-metallic mineral building materials exhibit certain unique properties, which are essential in building and construction.

The main export destinations for the *non-metallic mineral products* sector are neighbouring countries, Japan and the USA, where the most important export products are worked monumental or building stone. South Africa has a comparative advantage over other countries, such as European and Eastern nations, lacking a similar wealth in natural resources. The sector's export propensity is only 7.3, though due to high transport cost and a disparity of requirements, standards and tastes in different countries.

The *non-metallic mineral products sector* supplies the local market with high quality products. Subdued demand conditions and delays in the delivery of low-cost housing have resulted in considerable idle capacity, with the sector experiencing a 1.6 per cent average fall in output on an annual basis over the period 1991 to 1996.

Material inputs are largely available locally and mainly sourced in the mining sub-sector producing sand, clay, stone and related products. A few large producers dominate significant portions of production, which are mainly located in the vicinity of raw material sources, and most are far from major markets. Transportation costs account for a significant share of total costs, especially where the distribution of finished products is concerned.

Non-metallic mineral products employs 1.12 per cent of South Africa's workforce. Labour and capital inputs both play a substantial role in the production processes, although its respective intensities differ widely across the various sub-sectors. The sub-sector producing cement is very capital intensive, whereas the brick-manufacturing sub-sector is highly dependent on labour.

Final imports account for approximately fifteen per cent of total local demand for non-metallic mineral products. Imports consist mainly of Italian tiles and European glassware, although large amounts of ceramic wares for laboratory or other technical uses, as well as kitchenware, are also imported. Very few imports of cement, bricks and sand and stone-related products are made, as transport costs are high. Local industries are not strong enough to compete with international competitors.

Tariffs of 20.4 per cent are an important factor in the small pottery, china and earthenware sub-sector. The same is true of structural clay products, which will be protected by a 10.1 per cent barrier once the tariff phase-down has been completed. The glass and glass products sub-sector has been hit very hard by tariff reductions (IDC, 1998:18.1-18.27).

With liberalisation of trade increasing, international competition will infiltrate every village and town and if people in South Africa do not modernise and embrace this new technology, they will not be able to enter the market, and those already operating will be pushed out (Gibson-Graham, 2003:1002). The real challenge to the manufacturing industry is to become and remain competitive in the new economy where the realities of globalisation, rising competition, increasing returns to scale and modern

technology prevail. The following section considers the influence of globalisation on competitiveness and industrial development.

1.6 GLOBALISATION, COMPETITIVENESS AND INDUSTRIAL DEVELOPMENT

The developments in the South African economy, and in particular the development of the manufacturing sector described in the previous section should be seen within the context of globalisation. This section considers the effect of globalisation on the economy. The different views on globalisation are considered, as well as the way it is transforming the economic space, production technology and costs. In the new economy, people, cultures, regions and economies are melded into a global market through the advances in transportation and information and communication technology (Warf, 2003:485). At the same time, the number of significant decision-makers within countries is continuing to multiply as resources, autonomy and authority shift from the centre to regions and cities. This is raising the importance of global trade for economic development of all locations or regions. Most governments now realise the value of developing and refining their global economic strategies and open up their economies. This is mainly done through trade liberalisation and economic integration or regionalisation. An appropriate industrial policy and competitive platform should enable the economy and nation not to withdraw from the global world, but to position itself strategically so that it can benefit from globalisation and mitigate the adverse impacts that globalisation might have. International trade is becoming increasingly important to regional wealth as the volume of cross-boarder trade is increasing. This leads governments to develop global economic strategies.

The forces driving globalisation are:

- Trade liberalisation and reform programmes, aimed at opening up the economy to international trade
- Technological innovation, especially in transport, communication and information technology, the so-called "space-reducing" technologies. The pace of globalisation and of catching up of poorer countries, are largely tied to technological change. Declining costs of computing, communications, transport and logistics; trade and investment liberalisation; and regulatory reform enable new firms to enter and diversify cross-border activities. This lowers production and marketing costs, improve quality, widen consumer's choice and introduce new forms of exchange between countries.
- The evolving strategies of firms and individual investors that drive the new economy. Globalisation increases the competition that local firms have to face both in the local and export market.

International commerce is an important way for countries to develop and maintain a strong economy. World trade has grown significantly faster that production output in the world over the last decades and FDI flows has also grown faster than world trade. This is an indication of the increasing openness of economies. The various views on globalisation are studied next.

1.6.1 Various Perspectives on Globalisation

There are various viewpoints on globalisation. The *hyper-globalist perspective* regards globalisation as a drastic departure from past practices transforming markets and trade significantly. It is promoting international business and diminishing the powers of governments (Painter, 2003:359). The authority of the states is declining while authority is being dispersed to other institutions and associations (Martin, 2003:90). The importance of national borders and distinct local trade, finance and production are fading. Globalisation is placing the emphasis on pure economic principles while the powers of the state are marginalized. Some regard it as a modern form of oppressive global capitalism. UNIDO (2000a:1-5) sees it as a neo-liberal economic discipline imposed on all governments, such that politics are no longer the *'art of the possible'* but rather the practice of *'sound economic management'*.

The *sceptic view* on globalisation says that there is nothing new to it. International trade had always existed and even more so in the past. It can be shown that the share of industrial country GDP capital transfers is smaller today than during the 1890s. Cross border trade as a percentage of global GDP during the early 1990s were at the 1913 level when in excess of a third of all the world's production were across borders. Capital integration is also limited as global interest rate is not converging. Using longitudinal data of proxy measures of cross-border market integration, trade and capital flows, it can be seen that the world was more integrated during the colonial period than today.

Most people have a *transformational view* of social space, which is more or less between the two extremes mentioned above. The transformational view regards the present as qualitatively different from the past but not as radical as the *hyper-globalist view*. The development of information technology and especially the amalgamation of information technology with modern computer and communication technology, is braking down and transforming space through time and the consequent ascendancy of *'real time'* over *'clock time'*. Economic activities and transactions in real time are defined as those in which price signals and other economic behaviour are transmitted to economic participants simultaneously around the world, regardless of clock time differences that are determined by spatial distance, for example through the internet. The transformational view of globalisation states that government policies still has a role to play as it can contribute to the development of globalisation reaping benefits for its citizens. The following section discusses the most important objections to globalisation (UNIDO, 2000a).

1.6.2 Objections to Globalisation

There are a large number of people around the world that reject globalisation on economic, but also religious and political grounds. Many Christians believe that it will lead to the creation of a single international world government, which is unbiblical and will eventually suppress individual freedom. Countries also lose their autonomy as monetary policy will have to be co-ordinated as trans-border movements of goods and services facilitated through modern communication technology and the internet are increasing. Economic intervention and tax collection are becoming difficult to control (Webber, 2003:510).

Globalisation promotes the utilisation of modern technology, which requires skilled labour. This could lead to the marginalisation of unskilled labour off which there is abundantly supplied in less developed regions. Added to this, trade and market liberalisation leads to the disappearance of import restrictions and tariff barriers, which increase international competition. As less developed regions have far less capabilities to handle modern technology, they cannot achieve increasing returns like their competitors in Western countries and eventually they will price themselves out of the market. Workers therefore believe that they will loose their jobs as globalisation advances, especially for the unskilled. Liberalisation has already harmed some firms that were not internationally competitive and many people already have lost their jobs, but liberalisation has also created and strengthened many other industries, creating lots of employment opportunities (Erwin, 2001). These new jobs are also much more sustainable than those in economically uncompetitive firms.

The advantages of globalisation are however said to be far more than its disadvantages. Prices have declined and services have improved in many cases following privatisation and liberalisation. As low-productivity sectors are no longer subsidised at the cost of dynamic sectors, they are also becoming productive (Gundlach, 2000:118 & Walker, 2003:122). An example is the South African motor vehicle industry that did not close down after GATT was implemented. Instead this sector is now growing and their export contracts are increasing.

It is also believed that globalisation and liberalisation will advance economic development in the developed world with its modern technology and engineering expertise at the cost of the poorer regions. As international mobilisation of production factors and competition increase less developed regions will become irrelevant and poverty in those regions will be aggravated. If the highest quality goods at very low prices are offered and are easily accessed from anywhere in the world, people and firms in less developed regions will not be able to compete and their markets will be destroyed (Martin, 2003:90 & Grant, 2003:428). Governments will lose income and it will become ever more difficult to provide basic services. As a result the welfare of the less developed regions will decline as globalisation rises (Gundlach, 2000:116). Opponents of globalisation see the shareholders, managers and highly

skilled labourers as the only winners of globalisation, while less developed regions like Africa will lose their existing competitive base. Just like the other theories of the Structuralists, these fears are however not empirically substantiated, and it is not part of the mainstream paradigm of international economics.

Gibson-Graham (2003:102) says that *"globalization ... is represented as the march of an ever more powerful capitalism across the economic landscape, noncapitalist activities are rendered powerless or subsumed"*. The same applies also to the imperfect markets of less developed African countries. Whatever the view to globalisation is, the reality is that an integrated global capitalist economy already exists with major implications of the world economy and countries today. The following sections consider at the way globalisation is transforming the world.

1.6.3 Transformation from the Industrial Age to an Information Age

Globalisation is transforming the world from the *industrial age* to the *information age*. This new knowledge-based economy is a real time economy that allows all services to be transacted across borders, to be instantly out-sourced and hence subjected to one global market price (Schoenberger, 2003:383). Investment and utilisation in the new economy will determine the competitiveness of regions (Porter, 1998). It is being said that *"Those who realign their practices most effectively to Information Age standards will reap substantial benefits. Those who do not will be replaced or diminished by more nimble competitors"*.

This transformation of the new economy has an effect on the market and production. In the industrial age, national competitiveness was mainly based on price while the knowledge society of today also presents opportunities for global competitiveness, competing on quantity. In the industrial society services and manufacturing were clearly separated, these activities are, however, now being integrated as the economy is transformed by the technologies of the information era.

1.6.4 Effect of Globalisation on Cost, Production and Markets

The transformation into the information age had a direct effect on production. Custom-made flexible production processes are now replacing mass-production (Grant, 2003:415). Modernising production management, marketing and innovation are now providing a competitive edge (Walker, 2003:125). The old industrial society focused on costs, job differentiation and departmentalism, where management were organised in a centralised hierarchy and production occurred according to a well-established schedule. The new economy is driven by innovation, focussing on project and teamwork, utilising multi-skilled personal and job security rests on competence, not mere seniority. There is a continuous evolution of new production processes and the managerial hierarchy is decentralised (Unido, 2000a:5).

In the industrial economy, fixed capital was the most important factor of production utilised by manual work. Separate technologies were used in each process and information technology and knowledge was merely regarded as a supportive tool. In the new economy information technology and human capital are regarded as the most important production factors, and knowledge work has replaced manual as the most vital asset. The pace at which new technology is accepted determines the rate of globalisation. Globalisation benefits capital-friendly environments and highly skilled labour increases, while it increases competition in local and international markets. Trade and investment liberalisation and regulatory reforms then facilitate entries by new firms and diversified cross-border activities.

With space, markets are transformed from physical to 'real time' electronic markets through globalisation (Schoenberger, 2003:383), leading to a new global *'market discipline'* with a new *'global market place'* and *'global market principles'*. The *'Global market place'* refers to physical cross-border trade, and a *'global market principle'* refers to the emergence of structural constraints of unified standards of quality, costs and prices. *'Global market discipline'* refers to the manner in which these structural constraints are being internalised by individual agents. Through satellite communication, internet and other technology, real time forces individuals, groups and national governments to conform to international standards. Globalisation also creates social discipline that ultimately drives down wages and working conditions to the lowest common denominator all around the globe.

It leads to lower costs, better quality and wider choice for consumers and new forms of exchange between countries providing a new competitive scope. Supply and demand are the forces determining market price prices and in the past the outcome was on a *cost price plus* basis. With this new global market discipline, prices are determined on a *market price minus* principle. In the 'real time' world electronic markets enable on-line auctioning of goods and services while it occurs. Now simultaneous auction bidding drives the cost down to the purchaser by about fifteen per cent. The cost reduction potential of electronic real time markets is the main reason why globalisation offers to improve growth and prosperity of all (Unido, 2000a:5).

As the costs of transporting standard products and of communicating information continue to decline (Hanson, 2003:479). Modern factories and state-of-the-art machinery can be installed almost anywhere in the globe and distance and location are becoming irrelevant (Barnes, 2003:17). The application of information technologies, like Computer Aided Design (CAD), Computer Aided Manufacturing (CAM) and Virtual Engineered Composites (VEC) to production process has made production capacity in many industries sufficiently flexible to be viewed as a commodity. Thousands of moulded products can be manufactured faster, cleaner and cheaper and by remote control over computer networks and the internet. This means that almost all activities of a firm can be out-sourced competitively. Enterprises are evolving from the traditional corporate organisation to a loosely

confederated network structure in which many discrete fabrication activities and services can be bought in the short term from the best or cheapest suppliers wherever it is in the world. This relieves the buyer of the cost of accessing capacity that might not be used again in future. Global industries are developing networks of small independent businesses, spatially dispersed over several countries, that offers flexible capacity and compete within the electronic network (Sunley, 2003:193). Corporate organisations are also re-configured from vertical bureaucracies to what is called "*adhocracy*", horizontal organisation of firms or the "*post entrepreneurial firm*". The inter-linking of large corporations in new strategic alliances and co-operative ventures is also emerging (Unido, 2000a:6). In principle it also allows small companies from poor countries to compete for business with big established ones from rich countries.

The following section looks at the way in which spatial geography is influenced by globalisation. The new economic geography is now becoming relevant again as the so-called standard Marshallian trilogy of skilled labour market pools, intermediate goods, and knowledge spill-overs are becoming more relevant as globalisation increases (See chapter 3). *"By its very nature, globalization is an economic geographical phenomenon, and traditional economic geographical ideas around spaces of flows, and places of control and production, are central to its understanding"* (Barns & Sheppard, 2003:3).

1.6.5 Globalisation and the Spatial Distribution of Economic Activity

Physical features prescribed space in the past, but today space is becoming increasingly articulated through the circuitry of electronic impulses, like microelectronics, telecommunications and computer processing systems. This type of space is borderless and timeless (Schoenberger, 2003:383). '*Nodes*' and '*hubs*' are formed at the co-ordinates of the circuitry, which are still specific places, with well-defined social, cultural and functional characteristics as well as physical locality, like Silicon Valley in California. Capital, knowledge, information, technological designs, images and symbols flow between these nodes and hubs, dominating physical locations. These nodes and hubs are then hierarchically organised depending on the relative weight of their functions in the network. In the networks of the global economy, only *segments* of economic structures, countries and regions are linked up in proportion to their position in this new international division of labour, while those outside the network are marginalized As the environment becomes more competitive and information driven some places are down graded while others are being incorporated, upgraded or even created. The global economy is highly dynamic, exclusionary and unstable in its boundaries. It is characterised by a variable geometry that dissolves historical economic geography (Unido, 2000a:4). In the following section the way globalisation is influencing the global hierarchy, is considered.

1.6.6 A New Global Hierarchy

Globalisation is changing the geography of the old international division of labour (Walker, 2003:121). The historical development of capitalism had concentrated *'higher value activities'*, and consequently also wages, at the consumer end of the chain, while leaving low value activities largely in the underdeveloped regions. Globalisation is now changing the division of labour into a new core-periphery relationship that cuts across national and geographic boundaries, bringing on board within the core, segments of the less developed world, and downgrading some segments and groups in both the traditional core and in the less developed world to peripheral status. The core-periphery division is changing from a geographic relationship to a social relationship (Unido, 2000a:8).

According to Krugman (1995b:327), it is now possible to *'slice up'* the value chain in a different way, and to also re-locate the labour intensive slices in the production of those goods. Information-intensive activities previously classed as *'high value-added'* activities are now *'real-time'* activities that can be done anywhere on the global.

This new social core-periphery hierarchy will become even more asymmetrical than it was in the past. The high value-added activities that are contributed by so called 'knowledge workers' are extremely mobile. Marketing experts, computer consultants, legal experts, financial accountants and top managers can go to wherever they can obtain the highest price for their labour. Silicon Valley in California has for example imported about one third of its talent from abroad. At the lower end of the value chain exactly the opposite is happening. Low value-added activities are still typically tied to tools and equipment, and to locations where raw materials are extracted. The move to market-oriented production in less developed countries is likely to put 1.2 billion workers from less developed countries into world-wide product and labour markets over the next generation. This will cause wages in the traditional advanced countries to fall by as much as fifty per cent while some wages in poor countries will rise UNIDO (2000a:8). Globalisation is thus altering the composition of social classes on a world-wide scale.

As globalisation is rearranging the architecture of world order, the traditional pyramid of rich and poor are replaced by a hierarchy, which UNIDO (2000a:8) calls a three-tier structure of concentric circles, which cuts across national and regional boundaries. The core is made up of the elite from all continents and nations, albeit in different proportions in relation to their respective geographic hinterlands. The core contains about twenty per cent of the world population. They have secure incomes either from permanent employment contracts or from investments. This core is encircled by a larger social layer of between twenty and thirty per cent of the world population, consisting of workers and their families, who labour in insecure forms of employment, thrown into intensive competition in the global market. Technology, volatile capital mobility and neo-liberal policies eliminate jobs by

machines and a driving down of wages and social conditions to the lowest global denominator. The third and largest concentric circle comprises of those who are already effectively excluded from the global system (UNIDO, 2000a:9).

The explosion in e-commerce and e-business since 1998 is mostly cost reducing and creates new markets, for example financial services such as derivatives owe their existence and profitability to the ability to calculate minuscule variations in movements in interest rates or exchange rates (Schoenberger, 2003:383). The most important effect of globalisation is that it increases competition for all companies, and modern policies must take not of that. The effect of globalisation on competitiveness and industrial development will be studied in more detail in the following chapter.

1.6.7 The Role of Industrial Policy in a Globalising Economy

The degree of freedom that the so-called South-Eastern Asian Tigers enjoyed, no longer exists as the economic reality is changing the economic environment. Global agreements, specific policy frameworks and new international ways of conduct are imposed and industrial policies have to take these changes into consideration. The most important factors that influence the new international ways of conduct are:

- Trade liberalisation
- New rules of conduct
- Technical change is accelerating
- Production is being globalised

1.6.7.1 Trade Liberalisation

Developing countries are reducing trade and investment barriers willingly because empirical evidence and experience of others ae convincing them of the benefits, but they liberalise mostly due to international pressure. Lall (2000b:30) states that *"the forces driving liberalization are partly ideological in nature"*. Many effects of liberalisation have been beneficial. Increasing competition has forced firms to raise their efficiency or close down. Comparative advantages that were held back by inefficient controls are now better exploited.

In many counties, liberalisation is damaging industry and employment creation. Even where firms in less developed economies survive and manage to upgrade their production technology, technological effort is often lower as they become more depended on imported knowledge. This retards technological deepening and affects their long-term competitiveness in complex technology and activities. The rejection of trade interventions takes away the most important instrument for the

promotion of new activities. Lall & Latsch (1998) found *"the theoretical base for liberalization is weak"* and *"unable to support the massive superstructure of neo-liberal policy built upon it"*. The economies of less developed countries (LDCs) will not be able to resist the trade towards freer markets and their industrial policies will have to be orientated accordingly.

1.6.7.2 New Rules of Conduct

The rules, procedures and norms of international trade and investment agreements are changing. This trend makes it more difficult to set industrial policy (Grant, 2003:413). Advanced countries are able to manipulate these rules to some extent but less developed economies cannot. These new ways of conduct involves FDI, local content, government procurement, intellectual property rights and services. These new rules are intended to *"level the playing field"* for all participating countries but there are fears that this could also restrain the development of national capabilities and increase the dominance of stronger economies and hold back the weaker. The new rules of conduct speeds up technological change, raise the quantity of information available and the extent of skills and institutions necessary to manage (Martin, 2003:90). These level playing fields remove barriers to information and lowers transaction costs to firms, but countries without the ability to manage these developments *"will remain beggars at the technological feast"*. Globalisation is therefore not really levelling the playing field (Grant, 2003:428). These countries will become more marginalised as rapid exposure to competition could devastate their fledgling industrial sector and destroy their small base of capabilities.

1.6.7.3 Technical Change is Accelerating

Changes in technology are rapid and sweeping (Warf, 2003:484). It is information intensive and the availability of information and computer technology skills and the ability to network are of the most important determinants of success in the new economy (Sunley, 2003:193). Innovations are changing the nature of knowledge and product flows as well as changing the comparative advantages of countries (Walker, 2003:125). Transaction costs are decreasing as transport and communication costs are falling and knowledge becomes available on the internet at insignificant cost (Hanson, 2003:479).

Technological change is also reducing the scope of various traditional industrial policies and is increasing risks. Market forces are not conducive to costly and long learning processes, and to only expose a developing economy to modern trade will not work. Country policies should strive to obtain these technologies and skills to handle it, as a lack of it will render the competitive platform inefficient. Policies should be geared to take their economies beyond the exploitation of static skills and low wages. Diversifying and innovations should be the aim. LDCs need to build more advanced capabilities to absorb new technologies (Rigby, 2003:209 & Lall, 2000b:30).

1.6.7.4 *Production is Being Globalised*

Production is being globalised (Walker, 2003:121). The costs involved in modern innovation necessitate selling to global markets and the setting up of production and distribution structures worldwide. Decreasing transport and communication costs and the ease of the internet for handling information through computer networks and new organisational techniques, make global trade more feasible (Schoenberger, 2003:383). Trans-national corporations are increasingly being integrated in production structures across countries, within their own networks as well as between them and independent firms rationalising supply and distribution structures (Page, 2003:249). This does not lead to equal distribution and presents new challenges to the authorities of less developed countries (Lall, 2000b:32).

Industrial policies should facilitate the formation of a technological platform. International trade and investment will not lead to the equal distribution of the benefits from new technology and the comparative advantages that new technology brings are even more unequal. New innovations are concentrated in the developed world. LDCs low capabilities receive the simplest operational knowledge and their competitive base remains static. Countries with high capabilities receive more advanced forms and their base advances over time. LDCs remain on the periphery, facing the risk of increasing marginalisation. Few countries have the ability to match international innovation on their own. The same applies to exporting scale-intensive products like motor vehicles and other high technologies like electronics. Government policies will have to raise their countries' skills and capabilities to improve their advantages.

It is important to build up a strong local firm base, because it would lead to higher quality of inward foreign direct investment and its spill-over effects. Large multinational companies are the main innovators but their investment activities do not lead to a wider diffused knowledge base (Page, 2003:249). The technologies that multinational companies deploy also depend on the capabilities of a location to absorb that knowledge. These multinationals and their affiliates also need a strong base of local suppliers to improve local content. This requires strong policies from governments. Multinationals do not undertake many of the simpler manufacturing activities and to promote these also require input from the authorities.

It is now recognised that traditional industrial policies that aimed at the promotion of industrialisation through substitution of imported goods behind high tariff walls, and through subsidies and other monetary advantages to "pick winners" that appeared to possess some sort of comparative advantage, have been largely inefficient and costly. It gave little attention to local competition and governments were poor at picking winners. These policies were inherently unfriendly towards capital, and inconsistent with trade policies and led to distort incentives for private sector capital formation. In

practice it was observed that inward-oriented economies performed significantly worse than economies that pursued outward-orientation, macro-economic stability and significant public investment.

The experience of those countries in Southeast Asia shows that free trade and an outward-orientation alone is not sufficient to ensure industrial development. Trade policy that improves the economic environment was also not sufficient to provide a sufficiently capital-friendly environment. This also applies to countries or regions which historically had been unfriendly to capital, and where market failures due to information asymmetries exist that raises the costs of doing business where past industrial policies have created economic structures that is not able to compete under global circumstances, and where the governments of other countries or regions take more interventionist stances. Consensus is reached on the principle that governments do have a role to play in a country or region's industrial development, primarily by ensuring a stable macro-economic environment, curtailing market rigidities and strive towards overcoming market failures. The role of the state in designing industrial policy should primarily be for the enhancement of competitiveness. The improvement of poor infrastructure, inadequate skills, poor industrial governance and outdated technology constraining industrial development also supports this. The competitiveness mix of infrastructure, governance, skills and technology are all in varying degrees dependent on the state. If the state fails to maintain law and order, guarantee the security of individual and investments, protect intellectual property rights, provide an efficient infrastructure, adequate training, education and health systems, enterprise-level competitiveness will be undermined.

For firms to become competitive and profit from the country's comparative advantage, the macroeconomic, institutional and infrastructure framework should be conducive. Governments can assist in the creation of comparative advantage through appropriate policies, but ultimately it is the task of corporate management to secure orders and build market share. Scarce resources and a shortage of skills limit African countries in becoming more competitive. Where the private sector is weak and undeveloped, the creation of an enabling environment for business is likely to yield disappointing results, certainly in the short-to medium term. Experience in Asia highlights the crucial catalytic role of FDI in building competitiveness. This is particularly important in the light of the large quantity of cross-border mergers and acquisitions taking place in key industries of developed countries.

The OECD countries reacted to globalisation by concentrating on competitiveness and efficiency. Tax systems are more neutral to investment, business tax rates are reduced, tax bases broadened and concessions abolished. In many countries, deregulation and privatisation have taken place on a large scale. Other significant measures adopted by countries include support for research investment, technological innovation and diffusion, labour training and specific incentives for SMMEs. Countries also emphasise the development of infrastructure to assist a spatially more equal distribution of economic activity.

The market reactions and subsequent economic performance associated with policy orientations, indicates that industrial policy should not only focus on manufacturing activities and governments intervention to adjust short term prices, but rather involve strategic government intervention in the economy to build national competitiveness. The building of national competitiveness involves the development of dynamic macro competitiveness as well as policies to promote micro- or firm level competitiveness, enhancing aspects like firm level price, quality and on-time delivery. The objective and focal areas of industrial policy still give the primary role to the state in building an enabling environment and competitive platform on which firms can build and exploit their competitive advantages (Lall, 2000b:29).

These policies are essential for South African and Sub-Saharan industry to make the difficult transition form resource-driven growth to a knowledge-based economy. The region is behind the rest of the world in coming to terms with this challenge. Resource-driven production is likely to remain the main engine of industrialisation for the foreseeable future. It is essential that policy makers should be proactive and forward-looking, focusing on creating the capability needed for industrial competitiveness rather than protecting existing advantages. Resource-driven industry is losing its market share in favour of fast-growing information- and knowledge-intensive industries. While African industry does not have competitive advantage in these fields, it risks being locked into slow-growing activities if they do not develop technologically. Even in traditional activities firms will be losing competitive advantage, if their technologies and work forces are not upgraded.

The following section will sketch the methodology and research agenda that will be followed in the studying of the thesis' objectives and testing of the research questions.

1.7 METHOD OF STUDY

1.7.1 Layout of the Study

This study will comprise both of a literature and an empirical investigation. An evaluation will be conducted to determine whether the competitive platform is sufficient for industrial development, especially manufacturing. The subject matter will be divided between the following chapters:

Chapter 1: Introduction

Chapter 2: The Theory and Practice of Industrial Policy

Chapter 3: The Theory of Industrial Location

Chapter 4: The Industrial Competitiveness Policies and Strategies in South Africa

Chapter 5: The Competitiveness Platform of South African Industries: Empirical Findings

Chapter 6: Summary and Conclusions

The study will commence by examining the theory of industrial policy. The aim will be to lay a thorough theoretical foundation on which the rest of the study can be build. In studying the theory of industrial policy the main focus will be on trade policy, enhancing productivity of individual firms and lowering their cost structures, clusters, agglomeration and regional development and the macro-economic policies. The chapter will at first establish what industrial development intent to accomplish, why it is necessary and why government intervention and industrial policies are required. Studying the importance of global trade, considering both the importance of imports and exports will follow this. Strategic trade policy and market protection and the possibilities of regional co-operation and integration will also receive attention. Global trade is, however, not without its problems and criticisms as a scarcity of policy instruments always prevail providing policy dilemmas to policymakers. This section will finish by considering these problems.

In reality it is in the first instance firms competing and not countries. Chapter 2 will therefore also consider the theory of production on a micro-economic level and try to establish which role industrial policy could play in an effort to achieve industrial development in a global context. The allocation of resources, choice of factor intensity and the complimentarily of production factors will receive attention. The last part of this section will consider the enhancement of technology as an industrial development strategy, including endogenous growth, capital formation and factor mobility.

Although clusters, agglomeration and spatial development will be considered in chapter 4, it will also be placed in context in chapter 2, followed by as study of macro-economic policies. Monetary, financial and exchange rate policies are relevant to industrial development as it has a direct influence on prices, credit and other aspects influencing the competitiveness of firms. Inflation rates that are too high can price firms out of the market and governments should aim at stabilising prices. This will be considered together with other measures like price control, promotion of foreign direct investment, the value of multinational corporations and privatisation as incentives to attract more foreign funds and investment.

The second part of chapter 2 will consider the components of industrial policy. This part of the literature study intends to bridge the gap between the theoretical chapters and the practical situation. The chapter will attempt to present adequate background knowledge about the components that are usually included in an industrial development policy, the contribution that it can make towards development and how higher competitiveness in its industrial sectors can be achieved. The new economic environment will be studied with its new rules of conduct, requirements and accelerating technological change. The problem of convergence and divergence that modern technology and

globalisation cause and how this can be accentuated or diminished through industrial development, will be considered followed by the various limitations and problems that selective industrial policies could bring about. Chapter 2 will also consider how governments can build capacity and capability to become and remain competitive in the new global economy. The acquisition of capacity, stimulation and financing of technological development, technological infrastructure and the development of a skill base for modern industrial development will be considered. The chapter will conclude with a study of the experiences of fast growing economies had, especially in Southeast Asia, and will consider the relevance of the subject matter studied in this chapter to industrial policy of Africa.

In the third chapter the relevant theory will be studied concerning economic geographical location and development, especially with regard to the development of infrastructure, dissemination of information and other measures that the authorities typically provide in industrial strategies. The theoretical study would utilise the newest theories in economic geography and industrial settlement as well as the established theories. The chapter will focus on the traditional and modern explanations of the locational decisions of firms, the relation between manufacturing location and regional development, and modern theories and research in spatial economic development.

As industrial development policies of the authorities play a major role in the country's competitive platform, the fourth chapter investigates the official economic policy framework of South Africa in which industrial development functions. Chapter 4 will commence by considering competition policy in South Africa. To understand industrial development policy in context a historical overview of industrial policy in South Africa since 1910, as well as the development of regional industrial development policy in South Africa up to the acceptance of the SDI strategy and GEAR will be considered. Next the macro-economic context will be introduced and the GEAR, SDI and IDZ will be studied in more detail. This will be followed by the main focus of the study, considering South Africa's industrial development policy, which is specifically designed to address the industrial development challenges in the new global economy.

In Chapter 5 the competitiveness of South African industries are considered. First related studies and surveys already done in South Africa will be studied and then the empirical findings of a new survey that was done for this thesis will be considered. Chapter 5 first considers competitiveness indices. The World Competitiveness Index will be studied in detail as it is considered the most comprehensive and reliable index available. In this chapter attempts will also be made to calculate competitiveness indices for South Africa and its provinces and manufacturing sub-sectors according to their methodology. The Global Competitiveness Index and the Globalisation Index will also be investigated and the problems concerned and criticism sometimes expressed against these indices will be considered.

Then sections 5.3 and 5.4 of chapter 5 will consider competitiveness of South Africa, especially measured by the above-mentioned indices. These sections measure South Africa's competitiveness on a national, provincial and municipal or metropolitan level. Competitiveness of provinces will then be studied considering provincial cluster studies of the IDC (Suleman, 1998), the Regional Industrial Location Study and the PIMMS database.

Following this, section 5.5 of chapter 5 will focus on obstacles to competitiveness on a national, provincial and metropolitan level by studying reports of the National Enterprise Survey and the World Bank Survey on the Greater Johannesburg Metropolitan Area.

In the second half of chapter 5 the industrial competitiveness platform of South African Industries will be ascertained empirically. A questionnaire was sent to the various firms, focussing on the manufacturing sub-sectors. The results of the questionnaire will be analysed and reported in this chapter.

Chapter 6 will provide a summary and conclusion to the study and make some suggestions towards higher competitiveness of South African industries and the promotion of an international competitive industrial platform.

1.7.2 Empirical Analysis

A questionnaire was compiled based on Porter's Competitiveness Diamond, which represents the industrial competitive platform as described in section 1.2 and largely draws on research by the IDC (IDC, 2001). A copy of the questionnaire is attached in the appendix at the back of this thesis. The questionnaire is divided in the following sections: Part 1 contains general descriptive questions about the responding firm, like type of products, size and location. Part 2 considers spatial development initiatives in manufacturing development. Part 3 evaluates the competitive strengths and opportunities of firms. This part of the questionnaire is important as it provides much information related to the Porter Competitiveness platform. Questions is asked relating to human resources, other resources, demand conditions, related and supporting industries and institutions, firm strategy, structure and rivalry, technology and innovation, quality and the environment.

This questionnaire also contains special questions built in to test the principles of the new economic geography and competitiveness of companies. Part 4 considers possibilities for expansion and possible locations for expansion. Part 5 considers the beneficiation of production output, flexible production, the educational levels of employees and reasons for absentees. Part 6 considers backward linkages and possible manufacturing opportunities. Aspects of the manufacturing plant's location were investigated in part 8.

Part 9 of the questionnaire considers the estimated current activities of manufacturers and asks questions on the future expectations of manufacturers. The final part 10 considers obstacles that hamper the activities of manufacturers and their expectations on investment possibilities and expected limitations during the following twelve months.

The questionnaire was sent to manufacturers in a way that would be easy and convenient for the respondents to complete and on which respondents can tick of the most appropriate answers. Respondents seem to be unwilling to answer long and difficult questionnaires with lots of detail, especially if it is sent by mail. To enhance easy responds to the questionnaire, most questions are based on a five-point scale that leads the respondents to provide a rating using a limited number of response alternatives. This also forces the respondents to take a stance and the tendency to choose a neutral position is avoided. For analytical purposes, numerical codes was assigned to the different response categories in order to compute an overall evaluation score that reflects the respondent's attitude towards each object.

From a total of 14 000 firms the UNISA Bureau of Market Research took a sample of 450 manufacturers on a random sample base, stratified on all nine provinces and ten major manufacturing sub-sectors (Standard Industrial Classification SIC 30111 - 39520). The computer program SPSS 10.1 was used. The data was first divided into the different SIC sub-sectors and then a "random sampling" was done. In simple random sampling all elements in the population (SIC groups) have a known equal chance of being included in the sample (Martins, Loubser & van Wyk, 1996). A random sample based on the number of cases (50 firms from each SIC sub-sector equally divided between provinces) was taken without replacement; so the same cases could not be selected more than once. The questionnaire was then posted to these firms during the first semester of 2002, followed up by telephone calls, e-mail, facsimile and postcards. Seven fieldworkers were also appointed to visit some of the firms to complete and collect some of the questionnaires. A total of 67 firms (17% of the survey) eventually responded to the questionnaire, which was considered to be sufficient to conduct an empirical study on the responding firms.

The responses to the questionnaires was analysed using SAS-programming. Statistical analysis is aimed at the determination of the reliability and the validity of the results obtained in the questionnaire will be conducted first. The Cronbach Alpha test[1] for reliability was implemented to determine reliability coefficients and the results were statistically significant. Next supporting factor analysis was conducted.

[1] The Cronbach Alpha test is an internal consistency test that estimates the reliability of a test based upon the number of items in the test and the average inter-correlations among test items. Cronbach Alpha yield internal consistency estimates, represented by the mean reliability coefficients that would be obtained from all possible split halves. If every possible split-half reliability coefficient for a test were computed, the average of those reliabilities would be equal to coefficient Alpha (Anastasi, 1988:122-124).

Once the validity of the questionnaire as reliable measuring instrument and the consistency of the respondents were established, descriptive statistical analysis of the data was conducted. Averages and one-way analyses of variance were determined. The first part of the statistical data analysis is based on descriptive statistics such as frequency distributions, while the second part considered specific topics studied in previous chapters of the thesis. After the descriptive data were studied on the whole sample, the same was done for the various provinces, manufacturing sub-sectors and firm sizes. The questionnaire considers human capital, education and training, productivity, science, technology and innovation, resources, demand conditions, related and supporting industries and institutions, firm structure and rivalry, the environment expansion, investment, spatial aspects, linkages and agglomeration, aspects of location, production cost and productivity, competitive intelligence, obstacles to industrial growth and expectations.

The International Institute for Management Development (IMD) publish a World Competitiveness Index for 49 countries annually. A standardised method to calculate a competitiveness index will be compiled based on the methods utilised in 2000 as well as 2002 by the IMD. The method that the IMD applied in 2000 is important as it contains more sub-sections. This will also be done for the various provinces, sub-sectors of manufacturing and firm size. Calculating the indices according to the 2002 IMD sub-sections will also receive consideration as it could provide more information regarding competitiveness.

The basic building block in determining the IMD World Competitively Index and ranking is the calculation of the standardised value (STD) for each criterion. This is done by first calculating the country average for each criterion and then to determine the standard deviation of that as:

The Standard Deviation: $S = \sqrt{(\Sigma(x - \bar{x})2)/N}$

And STD Value = $(x - \bar{x})/S$

Where: x = original value, $\bar{x}$ = country average and N = number of countries.

A high STD value usually reflects good performance, for example a higher value for the GDP would be better. For some values like the CPI a lower value would be more competitive though, in those cases a reverse ranking is used.

The sub-factor rankings are the averages of the STD values of all the criteria that make up that ranking. This is found by adding al the STD values in a sub-factor and divides it by the number of criteria in that sub-factor. These averages also ensure that all sub-factors will have an equal weight in the final total. Empty cells are given a STD value of zero. The sub-factor rankings are then added together to determine the Competitiveness Input Factor rankings. The competitiveness of South Africa's provinces and its major manufacturing sub-sectors will then be compared using these indices as well as the indices for the various sub-factor indices.

The competitiveness of South Africa will be studied according to the sub-factor divisions of the Global Competitiveness Index and the African Competitiveness Index of the World Economic Forum, by considering the answers on the questionnaires, without calculating the indexes again. This will also be done on the Globalisation Index and the Porter Diamond. Studying these aspects will provide additional information in the evaluation of the South African industrial competitive platform's ability to assist industrial and economic development. Following the general descriptive data, specific attention will be given to the principles of the neo economic geography, measures of globalisation, flexible production and other theoretical aspects.

Chapter 6 concludes the study with a summary of the findings and the implications thereof for industrial development in South Africa.

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CHAPTER 2

THE THEORY AND PRACTICE OF INDUSTRIAL POLICY

2.1 INTRODUCTION

Chapter 1 indicated that the aim of this thesis is to evaluate the competitive platform for industrial development in South Africa. Since industrial policy is a key instrument to improve the country's competitive platform, this chapter provides a critical analysis of the theory and practice of industrial policy. The chapter will commence with a discussion of the purpose and objectives of industrial policy and will then proceed to analyse the theoretical foundations.

The structure of this chapter is as follows: In section 2.2 the objectives of industrial policy is considered. The theoretical arguments for industrial policy interventions are studied in section 2.3. In particular, the role of industrial policy in enhancing efficiency, profitability and competitivety of the production processes on the micro-economic level are studied in this section.

Section 2.4 studies the drivers of competitiveness, discusses the stages of competitive development and Porter's approach to competitiveness. This section is important because the industrial competitive platform of South Africa's manufacturing industries will be tested empirically in chapter 5 and this section also provides a foundation for that part of the study.

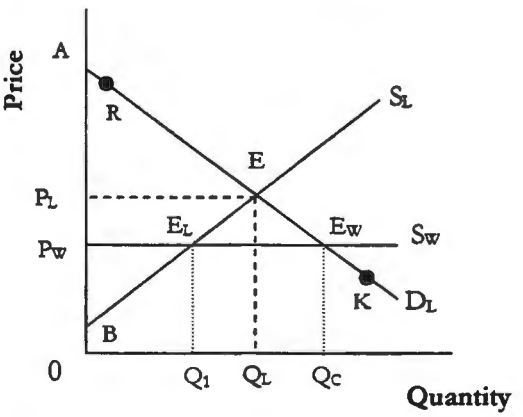
Section 2.5 considers industrial policy in practice. This includes an investigation into the ways that governments usually improve their competitive platform. This section presents a link between the theory studied in sections 2.2 to 2.4 of this chapter and the practical situation that will be investigated in subsequent chapters.

The practical limitations of industrial policy are identified in section 2.6. The chapter concludes with a summary in section 2.7.

2.2 THE OBJECTIVES OF INDUSTRIAL POLICY

In this section the motivation of government to adopt industrial policy will be considered. The purpose of industrial policy can be illustrated with a county's demand and supply curves. The economic position of a country in a global setting is illustrated in figure 2.1, where S_L and D_L represent local demand and supply curves and S_W the world supply curve. Internal equilibrium in this is at point E and the price of this commodity in a closed economy would be P_L and Q_L would be sold to meet local demand. When trade is opened at the world price P_W local production would fall to Q_1 and consumption would rise to Q_C, which leaves the gap of Q_1C to be imported.

Figure 2.1 Supply and Demand



A change in local supply from Q_L to Q_1 implies that international trade decreased local production and employment. On the other hand it is welfare enhancing. Before trade, consumer surplus was P_LEA and producer surplus BEP_L. Following trade the producer surplus dropped to BE_LP_W and consumer surplus rose to P_WE_WA. The increase in consumer surplus is larger than the drop in the producer surplus. The welfare gain is due to the substitution of low-cost foreign goods for local goods that cost more. The consumption effect of Q_LQ_C is a welfare gain caused by the reduction in price.

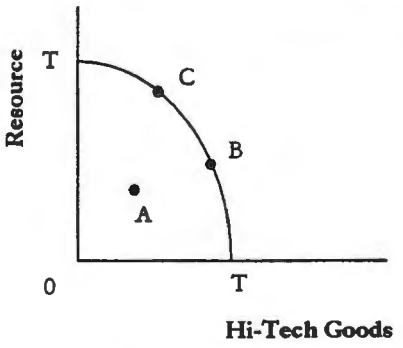
In this illustration international trade caused an overall welfare gain but local production has declined implying a loss to entrepreneurs and hardship to those that lost their jobs. The ideal would be if the point of local equilibrium could move towards point E_W. Industrial policy could be used to obtain this shift in the equilibrium position. If local production could increase to OQ_C it would create more employment but with supply curve S_L at its original position it would imply a loss to producers if they sell so much at a price of P_W. Industrial policy therefore have to shift the demand and supply to the right, and thus shift the marginal cost curves of individual firms as it is firms that compete in the economy in the first instance.

Industrial policy has to assist firms to decrease its costs, improve the productivity of the production factors, and present a stable economic climate that would induce higher investment and economic progress for all. Demand and supply could be manipulated through various incentives and measures. If the demand curve moves towards the right the consumer surplus would be enlarged, but local

production would remain at OQ_1. Firms' ability to gain a larger portion of the global demand will depend on their ability to deliver more commodities at a lower cost and/or of better quality. It is therefore important that local producers would become more competitive in relation to their opposition in other countries. Industrial policy is required to assist firms in the creation of their competitive position.

Industrial policy can assist in the enhancement of competitiveness by improving the efficiency and productivity of firms. This can be illustrated as follows. If all manufactured goods in a LDC are divided between labour-intensive resource based goods and capital-intensive technology based goods, the possible combinations available to producers are given by the production possibility frontier (PPF) curve TT in figure 2.2. It shows the opportunity cost of manufacturing one type op product in terms of the other. Producing hi-tech goods is more expensive and LDC would not be able to produce as much. Curve TT therefore cuts the horizontal axis closer to the origin than resource goods. To increase production on hi-tech goods from point C to point B, they will have to curb production of resource based goods. This might be to the advantage of LDCs as the price of resource-based goods is declining and much more profits could be made producing technology based goods. Firms do not have the necessary technology, knowledge and skills to manufacture technology-based goods. They also have a comparative advantage in the production of resource-based goods. Unfortunately higher technology is expensive and requires a pool of better-trained labour. Through industrial policy, government can assist producers through subsidies, tax incentives, research and development and labour training to move to technology-based production. World demand for technology-based goods is higher and the quality are better, making firms more competitive. Most LDCs do not allocate their resources optimally and therefore produce at point A. Industrial policy can assist firms in improving efficiency and move from point A to a point on the PPF. Intervention by government can assist firms in increasing their productivity, factor allocation and efficiency.

Figure 2.2 Production Possibility Frontier



The following sections consider the role of industrial development policy on micro-economic level and indicate how industrial policy fits into the theory of production in the advancement of competitiveness of firms and extends the rational for industrial policy. It was stated in section 2.1 that the aim of this chapter is to discuss the theoretical justification for industrial development policy. In theory, industrial policy can play a role in enhancing efficiency, productivity and profits in the production process.

Industrial policy can assist in enhancing the competitiveness of individual firms; improve recourse allocation, factor intensity and factor productivity, and are therefore discussed in the following sections.

2.2.1 Competitiveness of Individual Firms

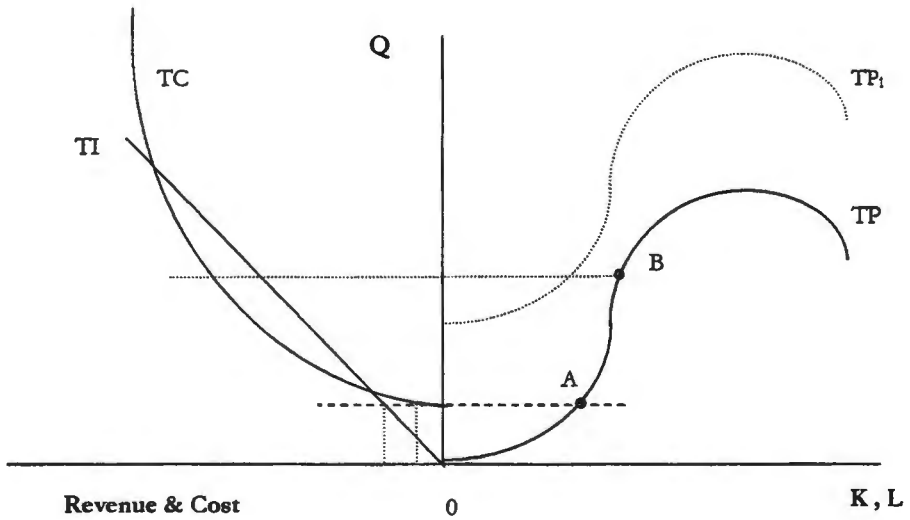
Suleman (1998:65) agues that government interventions could play a role in creating economies of scale and profits within the industry, thus giving credibility to government interventional policy. Krugman (1987:134) claims that *"increasing returns to scale and imperfect competition are necessary parts of the explanation of international trade, ... we are living in a second-best world where government intervention can, in practical, improve on market outcomes"*. Government can also realise that the positive externalities that some goods and industries spin-off, could justify intervention.

Firms are more competitive if their goods and services are preferred above those of their competitors. This may happen if their products are of a lower price and/or of better quality. Better market prices do, however, require production cost to decline, due to lower factor costs or more productive production technology on the micro-economic level. Industrial policy intervention can in the first place assist in improving the quality of labour through better education and training programmes. Industrial policy should also enhance the capability of local firms to acquire and utilise modern technology, which implies an increase in the productivity of capital goods. In chapter 3 it will be argued that competitiveness is also the product of superior production management, marketing and innovation, where supporting services, intermediate supplies and other firms outside the firm also contribute in the maximising of a particular firms profit margins and competitivety (see e.g. Krugman, 1991 & Helmsing 1999). Other ways that the government can apply to move the marginal cost curves of firms to the right (see figure 2.1) could include incentives like tax holidays, loans at special interest rates, and subsidies on labour, innovation, transport or research.

Goods and services are produced using land or natural resources, people and capital goods as factors of production. Entrepreneurs, managers and engineers apply this in the most efficient way to deliver products and services that are sold at a profit. If the price of production factors could decrease production cost would decline leading to larger profits, or it would enable the firm to increase its sales and production, as it would then be able to sell at a lower price. The same applies if the quality of production factors could be improved. If more output could be obtained when applying the same input, it means that less factors of production would be necessary and unit costs would decline, making a company more competitive. Higher productivity in effect decreases the price of production factors. Agricultural land could for example become more productive by applying more fertiliser, skilled labour could produce more output using the same material or time, and the production process would be

more efficient if it is better organised or if modern machinery is being employed. Industrial policy can thus assist firms in shifting down their marginal cost curves through training and/or the utilisation of better technology. Porter (1998a) applied these principles and stated that competitiveness depends on factor input and demand conditions, firm strategy and supporting services and institutions (see section 2.4).

Figure 2.3 The Production Function



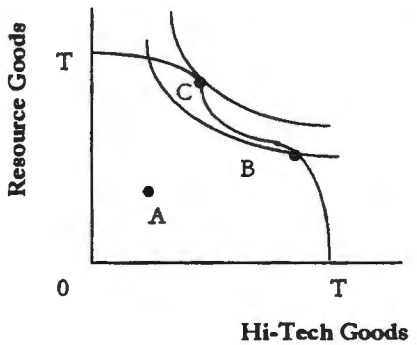
In this section the factors of production will be divided between human and physical capital and called labour (L) and capital (K). The right hand side of figure 2.3 illustrates the production function relating inputs (K & L) to the total product it can deliver. The law of diminishing marginal returns states that as more factors of production are employed in the production process, the marginal product would eventually start to decline and eventually become negative (Mansfield, 2000:202). That explains the form of the production function. At first increasing returns are enjoyed as output increase in excess of input. Eventually it reaches the point of decreasing marginal returns where the slope of the production function declines. This is the area of maximum profit where the marginal revenue and marginal costs of production are equal. As can be seen on the left hand side of figure 2.3, that is also the area where the difference between total revenue (TI) and total cost (TC) are the largest and most positive.

Most firms in less developed countries (LDCs) deliver low levels of output with a very low capacity utilisation. This means that they are in the position to produce at point A in figure 2.3. At that section of the production function, increasing returns to scale is obtained which might be to their advantage but it is not. The volumes of sales are too low to cover the costs. Total costs exceed total revenue, implying a loss to the firm. What should be done is to raise production towards point B to obtain

profits even though the marginal returns are declining in that area. Industrial policy can then assist by stimulating demand through tax incentive and assist firms through the provision of information, facilities and financial support to start exporting. International trade will enlarge their market and provide incentives to them to allocate their resources optimally. Sustainable higher production levels, lower marginal costs and better resource allocation would lead firms to production levels closer to point B where increasing returns are possible, market sale prices be lower and the quality of their products are higher, enabling them to compete in the international arena.

As one move down the production possibility frontier (PPF) production of one type of commodity is substituted for another. The rate at which this can take place depends on the slope of the curve and is called the marginal rate of transformation (MRT). It might seem ideal to produce at increasing returns to scale (IRTS) but this would be sub-optimal behaviour. Figure 2.4 shows a PPF where at least one product displays increasing returns (Mansfield, 2000:573). On top of this PPF are drawn indifference curves of the community showing various combinations of these commodities were the community would enjoy equal satisfaction. The slope of the social indifference curves is called the marginal rate of substitution (MRS) as it shows the ease with which consumers can substitute the two products. The efficiency condition is where MRS = MRT and that is where the PPF and indifference curves are tangent. In figure 2.4 this could be at either point B or C. Production would be most efficient at either point but moving from point B to C would imply that consumers move to a higher welfare point. This is an ambiguous condition. It is not possible, and when market failure does allow it, government intervention would be justified to rectify the condition. It would be sub-optimal production and long-term production would not be possible, as figure 2.3 had already shown such a mode of production to be non-viable, as revenue might not cover production costs. The existence of externalities and diseconomies in less developed countries might cause economic inefficiency causing such increasing returns and if that do occur government interventions will be justified.

Figure 2.4 PPF with Increasing Returns

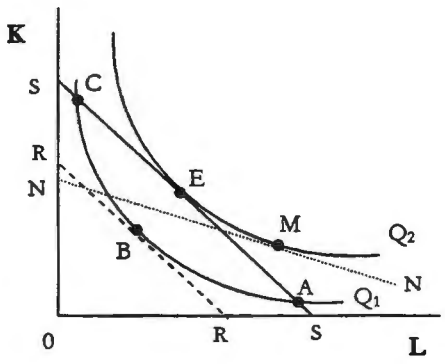


2.2.2 Resource Allocation

Optimal resource allocation is at the point where no factors of production are wasted and the highest levels of production, income and employment are reached. In figure 2.5, Q_1 and Q_2 represents combinations of capital (K) and labour (L) that would yield the same level of output. The further these curves, called isoquants, are from the origin the higher the level of production. Production is, however,

restricted by cost constrains. The budget constraint of a firm is represented in the graph by the line connecting the two axis's, like SS indicating various combinations of K and L that can be afforded. With a budget line SS production at point B would be sub-optimal as more could be produced at the optimal point of production factor allocation point E. At E the highest possible isoquant is just touched by the total budget line. It is the best level of production possible with the amount of funds that the firm has (Nicholson, 2002:302).

Figure 2.5 Isoquant Graph



LDCs suffer from an access of unemployed people and labour intensive technology might be preferred. Production at point M would be preferred to point E if that were the optimal point of production. The production process is however sub-optimal if factors of production are not paid what they are worth. If the marginal product of a factor is higher than its price, it would be a bargain and more will have to be employed and less of the other factors. If, on the other hand, labour is for example unproductive, the marginal product of labour (MP_L) is less than its price (the wage rate (w)). If that is the case, less labour and more capital should be employed. Optimal factor allocation would be where the ratio between the marginal product of a factor of production and its price equals every other factor of production. Thus: $MP_a/P_a = MP_b/ P_b = ... = MP_m/ P_m$ or in the case of capital and labour: $MP_L/w = MP_K/r$ Where r represents the price of capital which is usually seen as the real interest rate less the rate of depreciation. Alternatively, an optimal allocation would be where the ratio between marginal products should equal the ratio between their prices. This implies that the last cent spend on any factor of production should yield equal marginal products thus: $MP_L/ MP_K = w/r$.

In practice, LDCs are not allocating their factors of production optimally if historical performance is taken into regard. Firms are often producing at point A instead of E (Kleynhans, 2002:76). This implies that with the same cost outlay they could produce at point E, which is a far higher output. Movement on the budget line SS from point A to E would take the firm to a higher isoquant implying a gain in output and income. This would, however, imply that more capital goods would have to be employed and more people retrenched (Koutsoyiannis, 1991:86). Governments often impose tariffs and give subsidies to such firms in an effort to protect jobs (Mankiw, 2001:56 & Mansfield & Yohe, 2000:224).

Some firms are able to estimate their market demand rather accurately. For example, motor vehicles manufactured in South Africa are sold within six weeks (Van Zyl & Kleynhans, 1995:7). Many firms'

LDCs produce at point A in figure 2.5 and they could slide on the same isoquant, maintain the same level of production and reach point B, which operates at a far lower cost outlay on budget line RR. It would however, still decrease jobs in the short term, but would waste fewer resources that could be used to improve living standards in other ways. Better allocation of resources implies savings to firms, which can lead to lower marginal costs making them more competitive. If industrial policy could change the relative price of production factors, it would change the slope of the budget line and the point of optimisation of the labour and capital input base could shift down the isoquant to point M on the budget line NN in figure 2.5. Increasing the price of capital raising interest rates, for example, or increasing labour productivity through more education and training could accomplish this. Better technology and skills that improve the productivity of both capital and labour would move the budget line as a whole to the north-east of the graph, moving line RR to SS and even further reaching a higher isoquant. This would increase production output and income and might increase employment. This in turns also implies cost savings to firms, pushing their marginal costs down. As the marginal cost curves are the supply curves of firms, this enables them to deliver goods to the market at lower cost and better quality. This will lead consumers to switch their demand and substitute products from competitors for these products that are better and more economical. In this way it will enhance the competitivity of firms.

2.2.3 Factor Intensity

From a private-cost minimising viewpoint, it is correct for the individual to choose a capital-intensive method because it is the most effective one for him. But for the community as a whole, the social cost of under-utilised capital and labour are significant. Government intervention in order to remove factor distortion will contribute to employment and also to the better utilisation of scarce capital resources through better production techniques. As one moves down an isoquant, like from point E to M in figure 2.5, capital is being substituted for labour and the rate at which this can be done is indicated by the slope of the isoquant and called the marginal rate of technical substitution (MRTS). Equilibrium in the market is where the rate of substitution for products by consumers (MRS) and the MRTS of producers coincide. Optimal resource allocation is where the MRS = MRTS = MRT (Nicholson, 2002:278). The marginal rate of technical substitution provides policy makers with a tool in development planning.

The impact of factor price-distortions depends on the extent to which labour is substitutable for capital in the production process. This is referred to as the *Elasticity of Factor Substitution* and can be written as: $\eta_{LK} = [d(L/K)/(L/K]/[d(P_K/P_L)/(P_K/P_L)]$. This equation states that the elasticity of factor-substitution (η_{LK}) measures the rate of change in the proportion of labour (L) used relative to capital (K), as a result of a rate of change in the price of capital (P_K) relative to the price of labour (P_L).

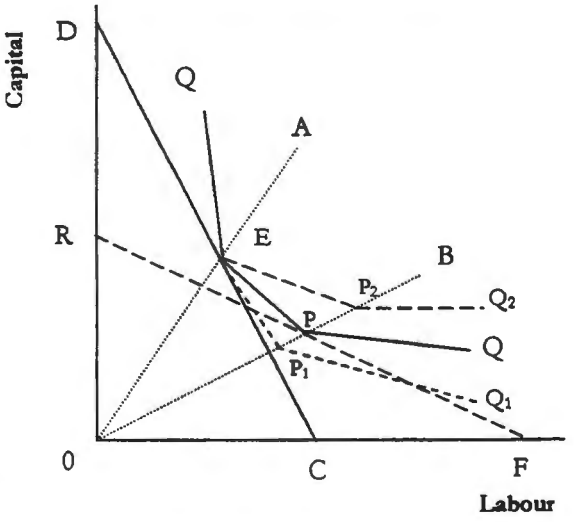
Relatively high elasticity of substitution indicates that factor-price adjustments can have a significant impact on levels and combinations of factor utilisation. In this case factor-price adjustments would be an important way of generating employment opportunities (Nicholson, 2002:278 & Koutsoyiannis, 1991:74). On the other hand, relatively inelastic substitution coefficient would enable firms to allocate resources in such a way as to obtain lower cost margins, higher profits and be more competitive.

Most empirical studies in less-developed countries found that the manufacturing sector provides elasticity of substitution, which range between 0.5 and 1.0. This means that a relative increase in the price of capital of 10 per cent will lead to an increase in employment opportunities of between 5 and 10 per cent (Naudé & Kleynhans, 2002:117).

Industrial development policies designed to change the relative prices of the factors of production, in less developed countries, can in theory help to achieve economic development. If every production factor receives what it is worth, it would lead to an optimal allocation of resources and this would benefit the community. If interest rates (generally regarded as the price of capital) would increase, for instance, it would lead to more efficient and more productive investment, because the highest profits will then be necessary to pay back investment loans. If interest rates increase it will reflect the true scarcity of capital in LDCs (Todaro, 1999:172, & Todaro & Smith: 2003:237).

A smooth isoquant like Q_2 in figure 2.5 implies an infinite number of production techniques available to producers as one moves down the isoquant. In reality, technology only offers a limited number of ways to produce something, although research and innovation are continuously discovering new way of doing things better and cheaper. To draw an isoquant like Q in figure 2.6 is thus closer to reality (Pappas, 1985:276). The figure shows that there are two different techniques available to manufacture a certain product, technique A and B. Assume that dualism in this LDC causes one technique to be technology and capital intensive, utilising more expensive labour and cheap capital on the expansion path OA, and the other utilising a pre-industrial labour intensive technology on expansion path OB. Let CD represent the isocost budget line showing the possible input ratios when production is capital intensive and RF the labour-intensive

Figure 2.6 Change in Technology



pre-industrial method of production. If labour and capital costs respectively 50 and 150 per cent in the pre-industrial sector relative to the capital-intensive sector, the isocost lines can be draw to show that CF equals OC and OR is equal to twice the length of RD. If the capital-intensive process is used it is possible to produce with this cost outlay the quantity of output corresponding to point F on isoquant Q. The same expenditure will yield output at point P using the pre-industrial process, which equals output at point E as it lies on the same output isoquant.

It is a matter of indifference whether the product is manufactured by process A or B as both delivers the same output. If the isoquant changes to line QEP_1Q_1, the pre-industrial process is less expensive and should be adopted. If on the other hand the isoquant changes to QEP_2Q_2, the labour-intensive process becomes more expensive for the same output. In this case the technology and capital-intensive technique should be used (Hirchman, 1978:128). Industrial policy could be used to manipulate production and costs to lead manufacturers in choosing production at point P_2. When capital-intensive production is too expensive, labour-intensive technology would be preferred.

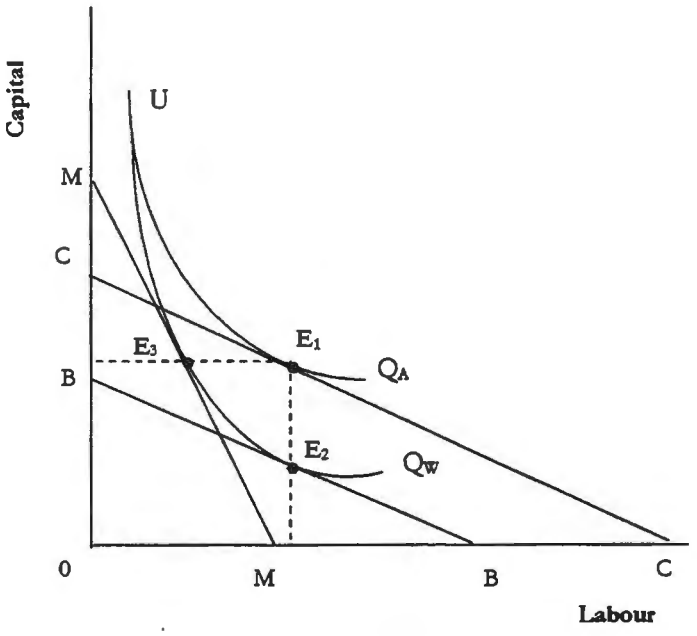
2.2.4 Factor Productivity

Capital-intensive technology is usually imported while traditional production is in process. The rationale behind the implementation of capital-intensive processes is the higher productivity of production factors that modern technology brings about. Labour is for instance more productive in industrial processes that are machine-paced than those which are operator-paced. Technical processes carried out by machinery provide factory operations with basic structure and rhythm, which in effect deal out functions and determine sequences. As more labour-intensive processes are used, the scope of poor performance becomes wider and companies become less competitive, especially in global context (Rossouw, 1998:14).

Poor labour productivity can also be the result of poor management. Organisational and managerial skills often correlate closely with labour productivity. Modern technology like managerial information systems therefore perform a vital function in aiding management. Adam Smith agued that mechanical inventions are important for the division of labour. There are various ways in which capital can enhance the efficiency of management and therefore of labour. This function of capital is of particular importance in under-developed regions where the task of co-ordination and co-operation are met with special difficulties. In the absence of industrial policy this co-ordination task is frequently performed by other devices like singing, magic or rituals, especially in co-operative work. In addition to this, capital-intensity safeguards production from miscalculation, inertia and decay (Hirschman, 1966:148).

The marginal rate of technical substitution of capital for labour is larger in LDCs than in developed countries. This is due to the need for more labour as the loss in managerial and labour-efficiency following the adoption of capital-intensive methods. More labour is needed than in developed countries to make op for a given decrease in capital (Hirchman, 1978:150). Labour productivity differentials between LDCs and developed countries are significant (World Bank, 1999:62). It can be expected that the production isoquants of LDCs and developed countries would only co-inside on its most capital-intensive segments as indicated in figure 2.7. As production becomes more labour-intensive their isoquants will follow different paths. In the figure UQ_A represents an isoquant of a LDC, which lies to the right of the isoquant of the developed world UQ_W. Identical factor prices in both countries will in this case lead to the adoption of more capital-intensive production in the LDC-country, where higher capital-intensity implies a larger capital-output ratio. Comparing points E_1 and E_2 shows that production at point E_1 requires more capital per labour input with the same factor costs (w/r) as the cost ratio BB is parallel to CC. This can be shown more realistically if it is assumed that relative factor prices are more favourable in developed countries and draw the price ratio line MM. This does not imply that technology utilise less capital than LDCs. In fact, this country's lower ratio of labour to capital cost at point E_1 shows that it should apply the same amount of capital as developed countries, which will now produce at E_3, the point on the isoquant tangent to MM (Hirchman, 1978:150).

Figure 2.7 Capital versus labour-Intensive Production



The above analysis illustrates that capital-intensive technology might also be well suited for under-developed countries in some circumstances. This is particularly applicable in large-scale ventures and activities that should be maintained in top working order that must observe high quality standards for their output to be internationally competitive. Leontief (1967:386) already pointed it out that LDCs may find it easier to approach the efficiency standards of developed countries in capital rather than

labour-intensive industries. The same can for example be said of the manufacturing of stainless steel cookware in South Africa (Rossouw, 1999:4). Machine manufactured products are usually of better quality and more competitive than hand-made goods. As developed countries are developing further, the importance of the tertiary sector, and especially services and maintenance, are increasing. This could gradually lead the developed world to become more labour intensive and import more capital-intensive products, like iron and cement, from other regions. This might force LDCs to produce more capital-intensive goods.

The above has shown the value of both capital-intensive and labour-intensive technology. In both cases industrial technology can be useful in increasing demand and supply conditions on the market and create employment and prosperity. The crux is that industrial policy should be employed to enhance the quality of both capital and labour in the production process.

2.3 THEORETICAL FOUNDATIONS FOR INDUSTRIAL POLICY

It was agued in section 2.2 that the characteristics of LDCs lead governments to intervene in the market to facilitate industrial development by enhancing competitiveness of individual firms, through better resource allocation, enhanced factor intensity, factor productivity and labour absorption. When policy intervention is necessary the first best option principal is that welfare losses are minimised and gains maximised when the government intervenes at a point in the economy closest to the policy objective (Kenen, 2000:189). This is however not always possible. The theoretical case for industrial policy therefore largely rests on the theory of second best due to market failures. These will be discussed in sections 2.3.1 and 2.3.2 below.

2.3.1 Theory of Second Best

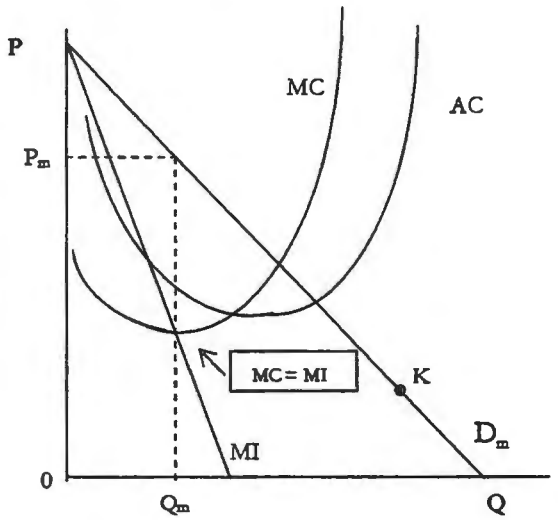
Governments are often forced to apply "second best" policies. Industrial development could for instance be supported by a devaluation of the less developed country's currency, but as this decreases the purchasing power of the citizen's money depreciation could lead to political unrest. Governments could then be forced to accept the second best policy of tariffs. Theory of the second best states that correcting one distortion in the presence of many may not improve welfare even if the policy makes perfect sense within the partial equilibrium framework containing the one distortion (Krugman & Obstfeld, 2000:225). It is not possible to know precisely what the outcome of a particular industrial or trade policy will be. The more complex the economy is and the more distortions and imperfections present, the more difficult it becomes to predict what the national effects of trade policies will be.
Bhagwati (1972) presented a general theory of distortions in trade situations. Bhagwati showed that for most distortions, trade policy is inferior (in terms of the extent to which it can raise national welfare) to

other purely domestic policies (Naudé, 2002). Government often applies second best policy options while better policies are available – this should be avoided.

2.3.2 Market Failures

A characteristic of market failure in less developed regions is that there exist incomplete markets or no markets at all (Ghatak, 1995). If one starts a business in a LDC chances are that the firm might be a monopoly or at least part of an oligopoly. In that case production would be at Q_m and the price P_m in figure 2.8 where the monopoly faces the entire market demand (D_m) and marginal revenue (MI) are also downward sloping. Not enough will be produced and the price will be higher that the free market price. This means that the majority whose demand schedule would probably be to the right of point K would not enjoy any consumption and the rest of the more affluent community would not be enough to cover OQ_m of the sales. The principle stays the same however. Industrial policy have to assist firms in decreasing their cost structures and raise the productivity of their inputs and production processes and the income of the poor has to increase. But as could be seen here: imperfect market models are not perfectly applicable to less developed countries, as large parts of the demand curve is irrelevant and the shape of the supply curve is uncertain. Due to market failures, even non-competitive models do not work perfectly in LDCs. Markets do not work efficiently, it is incomplete or absent and profit and marginal principles are not the only criteria at work in these regions. Maximum welfare is however, only possible if the market is functioning as a free competitive system. Government intervention is thus required to remedy market imperfections and to allow the market to function freely. Industrial development policy is thus of importance for the development of less developed regions and countries.

Figure 2.8 Monopoly - Equilibrium

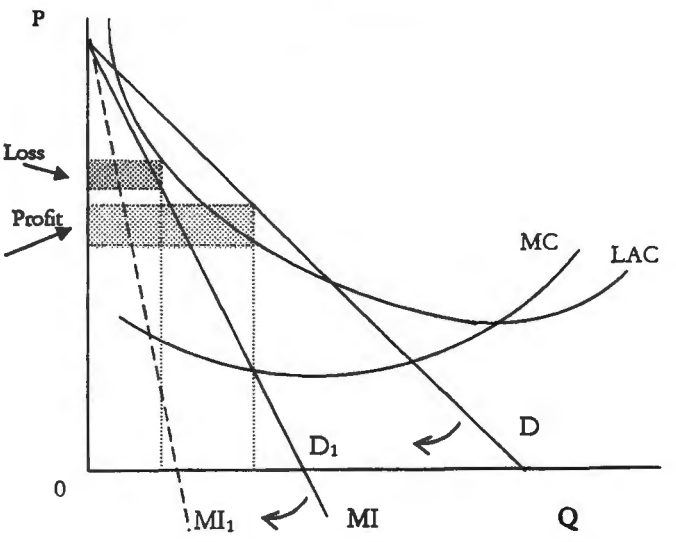


Capacity in less developed regions is under-utilised, which provides opportunities for entrepreneurs and communities that have the necessary initiative. There is usually excess local supply and labour is abundant. Prices are high and rising causing high rates of inflation, excess demand, low and reducing output and large-scale unemployment. These imbalances also cause balance of payment deficits.

Monopolies can also form when market entrance is restricted. This may happen when a single firm has access to all or the only resources, outlet or services in a region. They may own land where resources are or own patents or obtain single rights due to innovation. Most often monopolies are established through actions by the government. The government may provide goods or services to people in an effort to provide it cheaper, ensure that no shortages occur and through this enhance people's welfare. Governments often create monopolies through licensing and regulations. On the other hand it might be too expensive when there is more than one company producing in a region. When the long-term average cost curve (LAC) is downward-sloping over the entire range of output, a natural monopoly will form (Miller & Meiners, 1986:415), especially if the average costs are too high and too close to the demand curve (Gottheil, 2002:227). Figure 2.9 illustrates such an example of a natural monopoly. When there is only one producer, production would be where the marginal income curve (MI) crosses the marginal cost curve (MC). The price will then be where that production quantity line reaches the demand curve D. As the LAC curve, is below the demand curve costs per unit are less than the price and the monopoly would be able to make a profit.

Imagine another company starts producing and takes half of the market demand. Then each firm's demand curve D_1 could move to half of the original demand, where MI were and the marginal revenue curve would move in by half to MI_1 in figure 2.9. Now the quantity that each will produce is half and the quantity production line will cut the demand curve below the long-term average cost curve. In that case both would make a loss.

Figure 2.9 Natural Monopoly



Industries in LDCs often experience very large entrance and establishment costs, while operational costs are much lower. In South Africa firms like Iscor and Sasol could be privatised after they became operational. No one could however afford to establish these companies individually. In less developed countries industrial policies might assist companies to establish itself and once in operation in could become independent. Firms often produce at low volumes to keep competitors out. When a competitor wishes to enter a market, the existing company can increase its output at minimal cost

while the new competitor has to produce at high costs and run at a loss, making it nearly impossible for competitors to enter the market.

When monopolies exist in certain products in a country the opening of markets to international trade lead to competition. Kenen (2000:146) states that *"trade tends to increase competition"*. It can raise supply and decrease prices. Profits can also rise if competition leads to more efficient production and innovation (also see chapter 4 on the effect of agglomeration). When monopolies change to oligopolies or free competition, it can decrease profits and nearly always lead to lower consumer prices, which will raise welfare.

If the opening of trade leads to monopolistic competition involving differentiated products, it will present greater varieties to consumers. It could also lead to smaller varieties if it pushes the less efficient competitors out of the market. This could present opportunities to reach economies of scale to the surviving firms, reducing costs and decreasing consumer prices. International trade is thus always beneficial to the community as a whole.

The high-risk in less developed countries cause lower investment due to investors' negative expectations. Yield on investments has to be high enough to include a risk premium to make investments worthwhile. The high risk involved implies that LDCs would attract more investors that are risk inclined and irresponsible. This will restrict more conservative investors with a longer-term vision that could ensure more stability and less flight capital that is very volatile. An increase in the availability of information would decrease risk and increase investment, especially long-term investments (Mansfield, 2000:182). Information is often unavailable in LDCs and asymmetry of information is characteristic of these countries. Improved insurance systems would fill a need in LDCs but most are to poor to afford it. With poor economic conditions the dangers of adverse selection and moral hazards also increases. In this respect there is room for government intervention in restoring the economic function. When a perfect functioning free economy exists, problems like an absence of markets, would not occur. Governments should therefore strive to improve the free market mechanism.

Industrial policy has to improve the attractiveness of regions for new industrial location, assist in the creation of entirely new industries, generate manufactured exports, strengthen industrial clusters and networks and exploit potential future advantages. Other objectives are to train and develop human capital and revitalise existing uncompetitive and labour-intensive industries. The following section considers international trade and the role of international trade in improving competitiveness of local firms.

2.3.3 Trade Policy for Industrial Development

Neoclassical trade theory indicates that free trade offers higher welfare to a country, and it suggests that a country would do best in free trade if it specialises in the production of goods in which it has a comparative advantage. Industrial policy therefore has no place in the economy if it does not enhance free trade. To illustrate their argument and to indicate the justification for industrial policy therein, this section will deal with the relevant theory concerning international trade and the way it can support industrial development. This section will first consider why industrial policy should focus on international trade, followed by the effect of global trade on relative wages, import substitution versus export promotion, the role of imports in industrial development and strategic trade policy and market protection.

Industrial policy can enhance the comparative advantage of a region or country making it internationally competitive. Comparative advantage usually refers to factors that influence and preferably enhance efficiency and profitability of all firms in a region or country. The climate, availability of minerals or economic incentives could, for example, decrease the costs of firms operating in a certain region improving their individual competitiveness. The differences in comparative advantages of regions lead to specialisation, enabling gains to be made through trade (Isaacs, 1990:78). International trade are therefore an important aspect that has to be considered in the design of industrial development policy as it impacts on economic theory. Is was shown above that local demand in LDCs is too low to sustain industrial development, exports to other countries are therefore essential and the promotion of international trade should thus form an essential part of industrial development policy.

When production is limited to the local market a demand-ceiling is eventually met. Isolation from the international community also restricts a country's ability to obtain the necessary finance when there is not enough saving available in a country, as is usually the case in LDCs (Ghatak, 1995:154). International contact provides new technology and provides opportunities for innovation. International integration and global openness is indispensable because less developed African countries can in most cases only enhance their technological knowledge by the adoption of technology developed in the developed world (Naudé, 2001a:24). The idea that trade and global integration tends to increase economic growth is also supported by a number of empirical studies and surveys like Balassa (1978), the World Bank (1987), Michaely (1977), Edwards (1992) and Dowrick (1994) to name a few. To support industrial policy, trade policy could focus on:

- Policies that influence the macro-economic environment
- Policies intended to enhance comparative advantage of the region or country, and

- Strategic trade policies, which are *'policies that promote exports or discourage imports in particular sectors"* (Krugman & Obstfeld, 2000:275).

Various empirical studies had shown that countries that focus on export-led growth have achieved larger economic success than those that followed import-substituting strategies (Griffen, 1989). Suleman (1998:62) states that as trade and investment decisions are determined by comparative advantage, the standard recommendation of international trade theory that the best way to exploit comparative advantage is through the free market system. Allocation by the free market system leads to the most optimal allocation of resources. Global trade can then be viewed as a production process that operates most efficiently under a decentralised market mechanism. The basic reasons for international trade according to economic theory are:

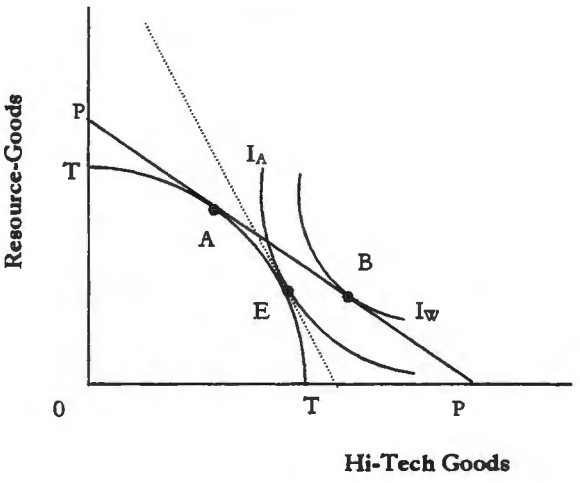
- Differences in technology
- Differences in resource endowments
- Differences in consumer demand
- Existence of economics of scale in production
- Existence of government policies

The Ricardian model of comparative advantage regards the basis for trade to be due to differences in technology (Kenen, 2000:61). Advantageous trade can occur between countries if they differ in their technological abilities to produce goods and services. If a country can produce some set of goods at lower cost than a foreign country, and if the foreign country can produce some other set of goods at a lower cost than it could be produced locally, then it would be best for a country to trade their relatively cheaper goods for the relatively cheaper goods from abroad. In this way both countries may gain from trade. To identify a country's comparative advantage requires a comparison of production costs across countries, considering the opportunity costs of producing goods across countries. The implication of the theory of comparative advantage is that everyone gains through trade; even technologically inferior countries can gain from free trade (Naudé, 2002). The welfare gains of trade are gains in production efficiency and gains in consumption efficiency and welfare.

Figure 2.10 shows internal equilibrium to be at point E before trade. When the price of technology-based goods decline, demand would increase and demand for resource-based goods would decline relatively. When global trade becomes possible the country would benefit from lower international prices. Production would move to point A on the production possibility frontier while consumption could move to the higher social indifference curve I_W making everyone better off (Du Plessis, 1998:30). International trade provides advantages to all even when money is flowing out of the country.

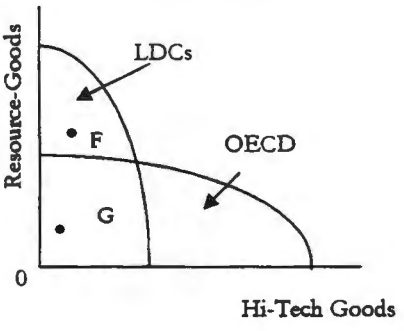
It could be expected that international trade would eliminate production in all but the most affluent nations as globalisation increases competition and erases national boarders. This will not happen as relative prices and resource endowments will still differ giving yielding opportunities for specialisation and gains that can be made through international trade (Kenen, 2000:37). Theory and policy often overlook the reactions of groups of people and countries differ when confronted by relative price changes, the application of technology and its influence on real production, labour market arrangements for different activities, consumer patterns, the type of expenditure and increases in taxes (Weiss, 1995:14). About these factors one cannot generalise, but these factors will always ensure that regional specialisation and international trade would continue and enhance everyone's welfare.

Figure 2.10 Higher Consumption through Global Trade



The production possibility frontier curves in figure 2.11 illustrate the resource endowment of LDCs and the developed world (e.g. the OECD[1]). With the opening of trade it will have to exploit its comparative advantage. As the prices of technology-based products decline LDC firms will tend to produce more resource-based and fewer technology-based goods, and their economy will tend to specialise in the production of resource-based goods (based on Kenen, 2000:37). The OECD economy, being the mirror image of LCDs, will then specialise in the production of hi-tech goods in which they have a comparative advantage. Industrial policy can assist entrepreneurs in their choice of specialisation by providing information, as information is scarce in LDCs.

Figure 2.11 Resource-Endowment



Trade offsets the difference in relative scarcities. Before trade, technology-based goods are relatively scarce in LDC economies, which is not well suited to produce it. Opportunities for international trade arise because supply and demand conditions differ between countries. The law of comparative advantage states that international trade will occur when the relative production cost differs between

countries. The gain in consumer surplus usually exceeds the loss in producer surplus when international trade occur leading to a welfare gain. This was illustrated in figure 2.1 where the consumer surplus increased from area P_LEA to P_wE_wA, and the producer surplus declined from area BEP_L to BE_LP_w. The gain in consumer surplus exceeded the loss in consumer surplus by area E_LE_wE, indicating net gain.

The Heckscher-Ohlin model moves a step further and accepts that regions also differ in the resources they posses. This model regards the differences in resource endowments as the basis for trade. The Heckscher-Ohlin Theorem (HO) expands the number of production factors making different factor proportions possible both across and within industries. Main elements of the HO Model can be summarised as:

- The Heckscher-Ohlin Theorem (HO): The capital-abundant country will export capital-intensive goods while the labour-abundant country will export labour-intensive goods.
- The Stolper-Samuelson Theorem: If the price of capital-intensive goods rises, then the price of capital, the factor used intensively in that industry will rise, while the wage rate paid to labour will fall.
- The Factor-Price Equalization Theorem: When the prices of the output goods are equalized between countries, as when countries move to free trade, then the prices of the factors (capital and labour) will also be equalized between countries. I.e. free trade will equalize the wages of workers and the rentals earned on capital throughout the world.
- The Rybczynski Theorem: an increase in a country's endowment of a factor will cause an increase in output of the good, which uses that factor intensively, and a decrease in the output of the other good.

The HO Theorem states that a country will specialise and export products for which it has the most resources available to produce (Du Plessis, 1998:47). Countries that have an abundance of labour will thus specialise in those products that require labour-intensive production processes. Trade is based on difference in factor endowments and helps to reduce the effect of those differences. Where Ricardo only considered differences in the demand and supply of labour, HO considers both capital and labour (Kleynhans, 1998:501). The theorem assumes that all countries have the same technology, they have no differences in labour requirements, economies of scale does not exist implying that size does not matter, and consumers have identical tastes implying that demand conditions does not differ. Less developed countries differ from the ideal model causing them to loose out on the advantages of

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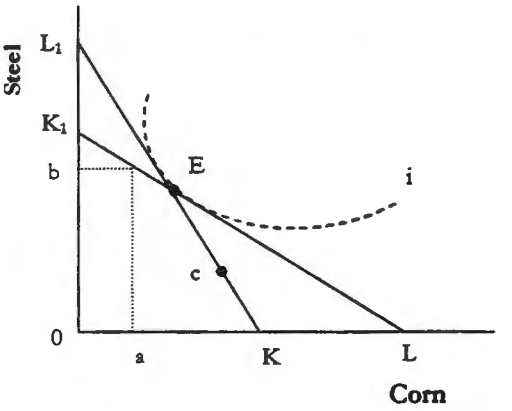
[1] Organisation for Economic Co-operation and Development (OECD) is *"an organisation of 20 countries from the Western world including all of those in Europe and North America"* (Todaro, 1999:500).

economic activity and retarding industrial development. Industrial policies are supposed to address these market imperfections in order to improve everyone's wealth.

Figure 2.12 The Heckscher -Ohlin Theorem



A country with an abundance of capital output would depend on its' requirement and supply of labour. Figure 2.12 illustrates a country's labour constraint with the straight-line production possibility frontier (PPF) line LL_1. Accordingly, the country's production would also be constrainted by its requirement and supply of capital illustrated by the PPF line KK_1. If both capital and labour were limited in this country, the PPF would be K_1QL. In this case the country can for instance produce 0a corn and also deliver 0b steel, but nothing more and some labour would be unemployed. At point E the country would be employing all its factors of production and point E would then be the full-employment output point. The relative price of corn at point E is given by demand conditions and an indifference curve at that point would indicate that demand preference. The labour constrain is steeper than capital, indicating that steel is a capital-intensive good and corn labour intensive. To produce corn at point c would utilise all labour but not all the capital.

Empirical work by Leontief (1956) and Baldwin (1971) could not substantiate the HO theorem. They found in various studies that American export production is not more capital-intensive than their import-competing production, as the HO theory predicts. In another study Stern and Markus (1981) did however find that between 1958 and 76 the capital-labour ratios were higher in American export production as predicted by the HO theory.

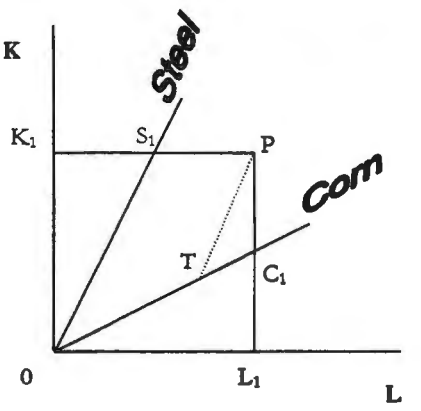
The Rybczynski Theorem states that a country's factor endowment influences its output mix. Rybczynski shows that if the factors of production are fully employed and factor requirements are given, an increase in the supply of one factor will raise the output of the goods that utilise that factor intensively and reduce the output of the other goods (Greenaway & Winters, 1994:20).

In figure 2.13 OS_1 and OC_1 lie on constant expansion paths of increasing production. It shows the K/L ratios of production. OS_1 represents the capital-intensive production of steel and OC_1 the labour-intensive production of corn. Point P defines the country's factor endowment. If the country only

produces corn, it will produce at OC_1 using O OL_1 labour and L_1C_1capital. This means that C_1P capital is idle.

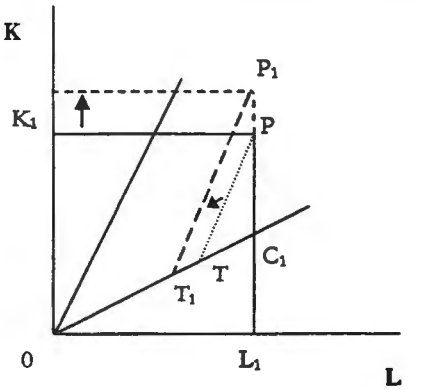
Figure 2.13 Factors and Output Mix

If this country in figure 2.13 on the other hand only produces steel, OK_1 capital would be used but S_1P labour would be unemployed, which implies that steel is a capital-intensive product. The solution is to draw PT parallel to OS_1 producing an expansion path OTP for production. The capital-intensive steel production will take place along TP and labour-intensive corn production along OT and there will be full employment of production factors at point T.



Should capital increase while labour remains constant line PT would shift back parallel and all capital would be utilised as in figure 2.14. Part OT would then move back to OT_1. The full-employment output of steel and corn are then at T_1 with P_1 now indicating the county's factor endowment. The country will now produce steel along T_1P_1, which is larger than TP and produce only OT_1 corn, which is less than OT. This is a restatement of the HO Theorem as it shows that an increase in the supply of capital would increase the production of capital-intensive goods (steel) and reduce the production of labour-intensive goods (corn) (Kenen, 2000:66). This can now be applied to the industrial policies of LDCs. Technology-intensive goods yield more profits and grow faster than resource-based goods. If LDCs wish to increase their economic prosperity they will have to assist their industries in obtaining modern technology and equip labour with the necessary skills. When better capital and labour are available in a country, it will lead to more modern technology-intensive products for which an increasing global demand exists.

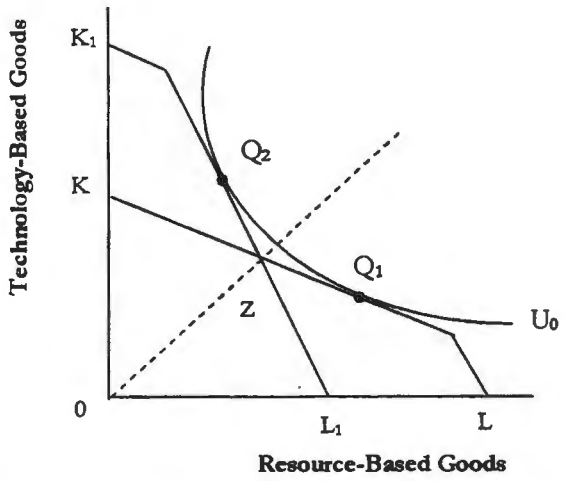
Figure 2.14 Capital Increase and Output Mix



The PPF curves of two regions (e.g. LDC and the developed world (DCs)) are shown in figure 2.15 according to the Rybczynski theorem. Production will be at Q_1 and Q_2 in the respective regions (regarded as two single countries). Touching the highest obtainable indifference curve U_0. One region or country will produce more resource-based goods (R-goods) as it has more labour and R-goods are

labour-intensive. The other region has more capital and will produce more capital-intensive technology-based goods (T-goods). The region with the abundance of natural resources and labour produces at Q_1 and the country with the resource factor constraint will produce at Q_2, putting its consumers on the same indifference curve (U_0 is probably a global curve). The slope of the indifference curve gives an indication of the relative price of resource-based goods in both countries. But the slope of the indifference curve U_0 is steeper at Q_2. This implies that resource-based goods are cheaper in the labour-abundant country or region; and price differences always present opportunities for trade – even to LDCs.

Figure 2.15 Trade and the Rybczynski Theorem



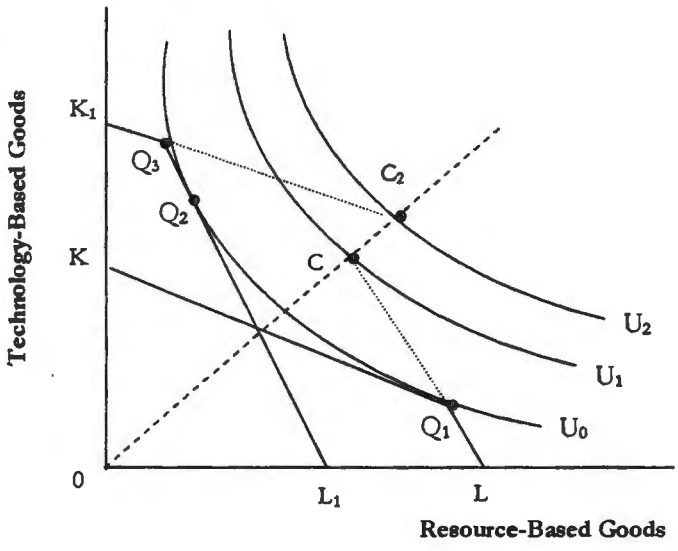
International trade will equate prices in both countries. The slope of the price ratio lines must be equal at Q_1 and Q_2 in figure 2.16. The dotted lines in the figure connect the different counties' points of production and consumption. In the R-goods country, production remains at Q_1 while consumption moves to point C on the higher indifference curve U_1. Production in the T-goods country moves to Q_3 and its consumption to C_2. This shows that international trade benefits the T-good capital-intensive country more than the R-based country. Industrial policy should therefore strive to reduce LDC's dependence on resource-based goods.

The HO assumptions used in the above analysis are however unrealistic. The developed and under-developed world does not have the same demand conditions and their indifference curves would differ. All the factors of production are not fully employed –especially in LDCs and they do not have the same technology. If that was the case the levels of living in LDC could have been far higher, but market failures and under-development prevents it. Trade and advertising would eventually bring tastes and thus demand closer together, but that will take time. If resource-based countries are less productive, C_2 would be even further away from C, benefiting the technology-based country even more. Industrial policy should then aim to raise productivity in resource-based countries through higher production efficiency and enhancing technological expertise. The country with a shortage of unskilled labour would experience higher wage rates while capital would be relatively cheaper and more

capital-intensive technology would be applied there. In the relatively labour-abundant country all labour would not be employed and Q_1 would not be a most efficient optimal point of production.

According to the HO Theorem the relative price of labour-intensive goods will also be lower if the relative price of labour is lower in a country before trade, as it is the price of an input to the production process. It would then also export labour-intensive goods when trade opens. The Stolper-Samuelson Theorem states that the price of the capital-intensive good rises, then the price of capital, the factor used intensively in that industry, will rise while the wage rate paid to labour will fall.

Figure 2.16 Trade Between DCs and LDCs



The Stolper-Samuelson Theorem implies that trade will raise the share of the production factor to the national income, which is abundant in a country, and decreases its share in a country that has more of another factor of production (Du Plessis, 1998:115). This happens as higher trade also increases the demand of that commodity. The price of that commodity will increase and with that demand for the necessary inputs of production will also rise. This will raise the price of production factors (Kenen, 2000:71). This implies that higher international trade will also increase wage in less developed African countries. As trade increases, demand for resource-based goods will also rise and this could discourage technology-based production. But the decline in labour demanded in technology-based production is less than the rise in labour demand in resource-based production and wages will rise. International demand for technology-based goods is however rising faster than demand for resource-based goods. This will cause the price of capital to rise and as the demand for labour in R-goods production exceeds labour demand for T-goods, the wage rate will also decline where resource-based goods are manufactured. The Stolper-Samuelson Theorem implies that trade reduces the effect of differences in factor endowments. Prices, wages and the price of capital will equalise in the absence of trade barriers, tariffs, and transport costs and when production factors are totally mobile (Kenen, 2000:71 & Krugman & Obstfeld, 2000:170).

When demand conditions do differ between countries, demand or factor reversal might occur according to the HO and Stolper-Samuelson theorems; for instance when a strong demand for capital exists in a capital-abundant country. If demand for capital increases, the price of labour will drop and this could lead to the country producing and exporting labour-intensive goods instead. Demand conditions are similar in most industrial countries and instead of ending all trade, most international trade still occurs between the most developed industrial countries. When markets open up, firms invade the markets of their competitors in other countries and try to gain their customers (Kenen, 2000:76 & 124).

The Stolper-Samuelson Theorem states that international trade has an influence on the price of production factors of countries. Microeconomic theory indicates that profit maximising firms will employ labour up to the point where the real wage rate (w) equals the marginal product of labour (MP_L) in that industry. So $w = P_{product} \times MP_L$ or $MP_L = w/P_{product}$ implying labour productivity. The Haberler theorem now states that when the price of a product increases, the price of the production factors that are employed in the production of that commodity will also rise at the cost of the other products and its inputs (Kenen, 2000:100, 86 & 90 & Haberler, 1961:222). An increase in the supply of a production factor will, according to the Rybczynski Theorem, raise the production of goods that are manufactured intensively by that production factor and the rest will decrease. Stolper-Samuelson implies that the real earnings of the abundant factor will rise while the real earnings of the scarce factors will decline. The implication is that industrial policy that assists labour-intensive technology could eventually lead to higher wages. When industrial policy leads to the acquisition of scare production factors like capital, the production of more high technology and capital -intensive goods could lead to higher returns on capital and declining wages in other sectors.

Even when most of the assumptions of the HO Theorem are released, factor intensity still depends on relative factors prices. Stolper-Samuelson indicates that an increase in the price of labour-intensive goods would lead to higher wages and decrease the return on capital. When the price of labour-intensive goods increases, the supply thereof will rise leading to a large demand for labour pushing up wages. In a labour-abundant country trade would thus increase wages and in a capital-intensive country trade would increase the yield on capital and suppress wages. If the prices of resource-based goods rise its supply will also rise, increasing the demand for labour, since labour is the production factor used most intensively in producing resource-goods. This will raise the relative price of labour leading to higher marginal products of labour. The wage rate will rise, implying that the marginal product of capital will decrease and the yield on capital will decline. This leads to the conclusion that free trade

will maximise global production because it closes the gap between marginal products (Kenen, 2000:111). The following section focuses on the effect that international trade has on wages.

2.3.4 Trade and Relative Wages

The theoretical justification for using trade policy for supporting industrial development can be found in the fact that it enlarges economic activity. As export from LDCs increase, LDCs produce more labour intensive goods, utilising mainly unskilled labour. The implication of this, according to the HO and Rybczynski theorems, is that global trade would increase the demand for unskilled labour in LDCs and according to the Stolper-Samuelson Theorem this would raise the demand for unskilled labour in LDCs and increase their wages relative to skilled labour (Kenen, 2000).

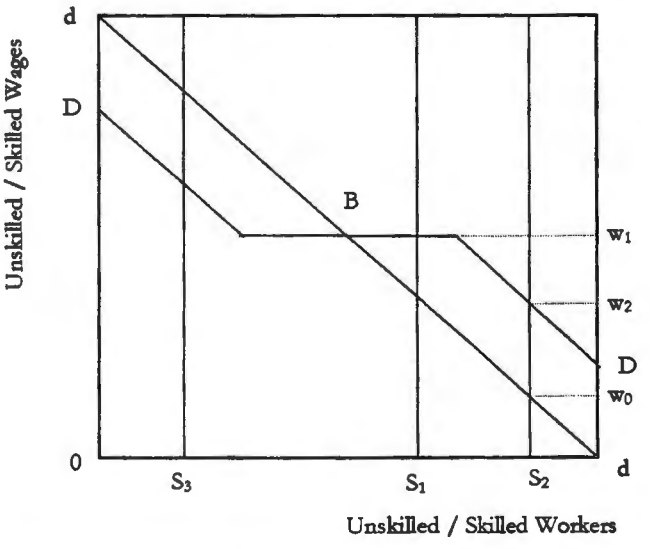
The HO Theorem implies that greater openness to trade increases efficiency and reduces wage inequality. As economic activity increases, production will have to rise and this means that more people have to be employed to realise that rise in production. According to the HO Theorem a country will export goods that are produced by the production factors that are relatively abundant. Goods that require production factors that are relatively scarce will rather be imported form other countries. Less developed African countries have a comparative advantage in the production of resource-based goods that requires relatively more unskilled labour. The demand for unskilled labour will thus rise with global trade pushing up its relative wage and decreasing the gap between skilled and unskilled wages. This will be to the advantage of unskilled workers in LDCs as their living standards are usually very low and they often live in poverty.

Theoretically, this benefits of increasing international trade mentioned in the previous paragraph can be explained by using the assumptions mentioned earlier that there are two countries, developed world and LDC, using two factors of production, skilled and unskilled labour, and two goods, skill-intensive hi-tech equipment and labour-intensive clothing. The LDC has a relative large supply of unskilled labour leading to a comparative advantage in the production of clothing, while the developed world has a relatively larger supply of skilled labour giving it a comparative advantage in hi-tech equipment.

Barriers to trade like high transport costs and tariffs lead to different prices in the two countries or regions. This may depress trade and even lead to autarky. Tariffs keep the price of clothing lower in the less developed country and more expensive in the developed world. The opposite goes for hi-tech equipment. A reduction of such barriers will cause an expansion in global trade leading to higher prices of clothing and lower prices for hi-tech equipment in LDCs. According to the Stolper-Samuelson Theorem, such changes in relative producer prices would lead to higher unskilled wages relative to skilled wages as the HO Theorem assumes that technology is the same everywhere (Kenen, 2000).

Wood (1997:35) illustrates the outcome with supply and demand curves as shown if Figure 2.17. The demand curve for unskilled labour in a state of autarky is illustrated by the curve dd. With no international contact wages would be determined at the intersection of this demand curve with the supply curve S_2. The supply curve's position depends on the country's endowment of skilled and unskilled labour and is assumed perfectly inelastic for the sake of simplicity. In a country with a large force of unskilled labour the wage rate would be as low as w_0 in Figure 2.17. The demand curve for a country open to trade would be DD, which will cross dd at point B. At point B the skill supply ratio is such that no trade would occur even when the country is open to trade. Equilibrium for the less developed country with its large supply of unskilled labour only exporting clothing would be to the right of point B, while the developed countries would lay to the left of B. This then implies that the demand curve of the developing country would move in favour of unskilled labour when trade opens, DD lies above dd, so the wage gap would narrow. With a skill supply ratio of S_2 the relative wage of unskilled labour would increase from w_0 to w_2.

Figure 2.17 Effect of Openness on Relative Wages



The middle segment of the open-economy demand curve DD has a middle segment that is horizontal. This part covers the range of skill supplies in which a trading economy would be diversified. Producing both clothes and hi-tech equipment, although in different proportions than under autarky. This could be the case in a LDC with a skill supply of S_1, while a country with a high proportion of unskilled labour like S_2 would only specialise in clothing producing no hi-tech equipment at all. A country with few unskilled workers would lie at S_3 and specialise in hi-tech equipment. Specialisation would put a country on the part of the demand curve that slopes down as higher supplies of unskilled labour will have to be absorbed by relative wage induced changes in the technology chosen to produce a particular commodity.

Regardless of the outcome being diversified or specialised, trade would increases the wages of unskilled labour. The effect on wages on subsequent changes in the labour supply would be different. For a diversified country at S_1 relative wages would be fixed by international prices at w_1. Changes in local labour supply would not affect relative wages, as the LDC's economy is not large enough to influence

international prices. The only change would be in the local composition of output and trade. A country specialising and laying at S_2 on the downward-sloping segment of DD would experience changes in relative wages due to changes in the local labour supply though. Here a relative increase in skilled labour would raise the relative wage of unskilled labour (Wood, 1997:36).

This model can be extended to include more goods, differentiated by skill intensity, and more countries, differentiated by skill supplies. All countries will then specialise to some extent as none would produce all the goods. Fully diversified countries that produce at least two types of goods would not experience changes in relative wages when changes in labour supply are small, but if such changes are large relative wages will change, as the country would be moving to a different segment on DD.

In LDCs to the right of point B in Figure 2.17 a reduction in the barriers to trade would shift demand in favour of unskilled labour and narrow the difference in wages. The impact on wages will also be larger for countries with a relatively large supply of unskilled labour. In those countries with an intermediate supply of skills in the vicinity of point B, trade would effect wages little and in either direction. Here trade will cause most sectors, which are the less skill-intensive sectors to contact. These countries export goods of medium intensity, but import goods of high and low skill intensity from countries with higher and lower relative supplies of skilled labour. Usually the range of traded goods of differing skill intensity is very large. The multiple-goods formulation causes the demand curve for an open economy to be more elastic than for a closed economy leading to smaller effect on wages when factor supplies change. It also shows that changes in factors supplies will have some effect on relative wages even in an open economy.

Most empirical studies confirm that the factor content of exports from LDCs is less skill intensive than imports and generally supports the view that greater openness benefits unskilled workers. In developing LDCs industrial policies should aim to promote international trade. This was confirmed by Londero & Teitel (1996:581) studying skill intensity in Latin American countries and Wood (1997:38-40) names various studies on LDCs by Krueger (1981), Wood (1994), Bourguignon and Morrisson (1989) and Fischer and Spinanger (1986). Also studies by Lee and Liang (1982) on Taiwan, Nambiar and Tadas (1994) on India, and Kim and Vorasopontaviporn (1989) that have found that trade increases demand for unskilled agricultural labour. The following section focuses on export promotion while it also aims to indicate that imports also have a place in industrial development.

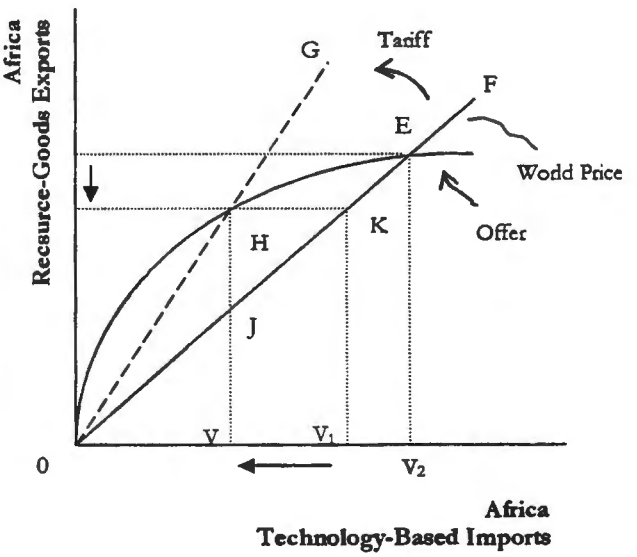
2.3.5 Import Substitution versus Export Promotion

Trade restrictions and controls was used extensively in LDCs in the past and criticised as it depress growth and lead to sub-optimal and inefficient resource allocation. Since, the 1980s liberalisation

began. Trade liberalisation involves the removal of control on access to internationally trade and foreign exchange. Liberalisation will have short and medium-term gains for a LDC due to incentives, foreign aid and more efficient production and trade. Theoretical base meriting the dynamic effects of liberalisation leading to a higher growth path in the longer-term is however often weak and vague (Weiss, 1995:80). Liberalisation leads to international trade enlarging sales markets, which could lead to economies of scale for LDCs, and provides the advantage of faster technical change in a more competitive productive environment. Exports can also grow faster than imports. These dynamic benefits do however require new investment and technology.

Trade restrictions and tariffs reduce the gains of global trade. If a country would impose an import tariff on labour-intensive imports, it would increase the price of that commodity and the price of labour. It would also reduce the price of that commodity in the exporting country (according to the Stolper-Samuelson theorem). This has an income distributional effect but upsets the fundamental trade mechanism. A tariff leads to differences in product and factor prices between countries. Trade will then no longer be able to compensate fully for the differences in the factor endowments of countries (Kenen, 2000:71). According to the Haberler theorem, tariffs tend to reverse the effect of trade by raising the real earnings of the scarce factor and reduce the real earnings of the abundant factor.

Figure 2.18 A Tariff's Effect on Two Commodities

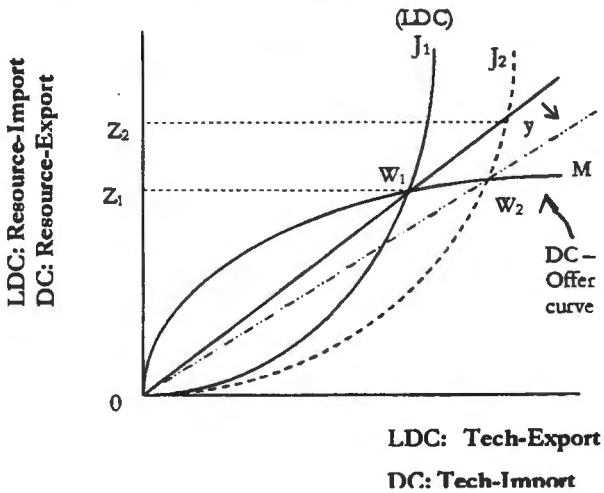


The effect of a tariff is shown using an offer curve for Africa in Figure 2.18. An offer curve connects two trade flows using relative prices. It shows how a country's offers of exports for imports from the rest of the world depend on international price ratios (Kindleberger & Lindert, 1978:496). A tariff on Africa's technology-based goods would move the terms of trade and its line from OF to OG. Demand for their technology-goods would decline but demand for resource-goods exports would decline too. This would reduce consumption and welfare in African countries.

The government will receive HJ from the tariff and equilibrium will have to lie on the international price ratio line OF. If the government spends this tariff on resource-based goods, equilibrium will be at point J. This will mean a drop in the export sales of resource-goods by HJ. Africa will now export JV to pay for OV_1 technology-goods. If the government spends that tariff income on technology-based goods the new equilibrium will be at point K. The supply of resource-goods will then remain HV, which equals KV_1, which is adequate to pay for OV_1 of technology-goods. Consumers will buy OV and the government VV_1, bringing the total demand for technology-goods to OV_1. The outcome will thus depend on what the government does with the tariff. Technology-goods imports would either decrease by V_1V_2 from OV_2 to OV_1 (or OV) and resource-based goods exports would decline by VJ or V_1K. What the authorities do with the tariff income would thus determine its effect on the country's welfare.

Imagine that conditions were different and the "LDC"-country is strong enough to influence prices. Figure 2.19 shows that if demand for resource-goods increases, more would be imported and an increase in the supply of technology-based goods would lead to larger exports thereof, but this will harm the terms of trade, illustrated by the price line becoming flatter. Demand and supply changes would lead the LDC to increase resource-based imports from OZ_1 to OZ_2 due to higher demand and as the LDC's supply of technology-based goods rises its exports would rise from Z_1W_1 to Z_2y. Point y has to be on the LDC's offer curve OJ_2. Equilibrium between LDC and developed countries shifts to W_2 implying that the LDC's terms of trade are deteriorating.

Figure 2.19 If LDCs could Influence Price



When the demand for resource-based goods increases it will raise it price and less resource-goods could be sold and the slope of the price line would become flatter, as was indicated in figure 2.20. It could then even be that consumption moves to point C_3 on a lower indifference curve indicating a welfare loss. The new terms of trade could offset the welfare gains of capital formation. This is called immiserising growth and usually occurs due to poor trade policy (Kenen, 2000:98). The net welfare gain would probably still be higher as capital formation has the ability to raise wealth.

It was noted that capital formation makes capital more abundant, decreasing the real return to capital. Capital formation should not decrease the income of capital owners so much that it offsets the gain by consumers too much and leads to a net negative effect. The terms of trade would only change in a country's favour if its economy were large enough, which is rarely the case in LDCs. In cases where it is possible, capital formation can improve welfare in other countries too. Poor policies can, however, lead to deterioration in the terms of trade decreasing the LDC welfare in favour of the developed world.

In reality the situation is just the opposite from that indicated in Figure 2.19. When capital formation rises in a resource-intensive country, it could lead to an excess demand of resource-goods and an excess supply of technology-based goods. But LDCs are already exporting resource-goods and importing technology-based products. This implies that the offer curve of the LDC would not move out but in. When the LDC is specialising in labour-intensive resource-based goods the effect of capital formation would be the same as in developed countries. It would depress the price of technology-goods and capital formation would improve the terms of trade of LDCs. Welfare in the LDC will directly improve due to economic growth and immiserising growth would not be possible. Welfare in developed countries will then decline relatively. Capital formation would decrease the price of technology-goods in all countries and it would raise the welfare of a capital scarce country because it will improve its terms of trade. If capital formation decreases the yield on capital it could also be in the LDC's favour because a decline in the price of capital could lead to a lower price for capital and decreasing interest rates, which could stimulate new investment.

Governments might consider tariffs or subsidies, for example on exports or research to develop new exports to address conditions of imperfect competition, but this might provoke other governments to retaliate and cause losses to all. The gains are largest when a country provides export subsidies and its competing countries do not, but this happens very seldom. The General Agreement on Trade and Tariffs (GATT) and the World Trade Organisation (WTO) are helping to phase out all kinds of trade barriers but there are still ways to get around it. They can for instance, give subsidies for job creation, production, or research and development instead of exports.

Import quotas influence quantities directly. Like all economic interventions, quotas intervene with economic efficiency (Du Plessis, 1998:126). The price mechanism that indicates changes in scarcity, supply and demand is then disrupted. Although tariffs raise state revenue, quotas do not. Quotas is unfair as some are given licences to import and sell and others not. It also provides opportunities for corruption and unearned gains. Those that may still import then gains the income, which would have

gone to the state. They are, however, consumers too and their welfare would also decline to some extend.

When tariffs are set too high the price of that product and all other products that utilise that product as an intermediate input and this could lead to a decline in the demand for that product, totally offsetting of that tariff. Some arguments for tariffs are logically sound but the same objectives can usually be obtained through less costly interventions. In theory the general rule is that welfare losses are minimised and gains maximised when the government intervenes at a point in the economy closest to the policy objective (Kenen, 2000:189). This rule is often violated using tariffs. When government wishes to change the income distribution it should change income taxes; and if they wish to change the composition of production a tax or subsidy on production would be better than a tariff.

Trade theory shows that there are more efficient ways to assist infant industries though. A production subsidy would be closer to the policy objective and increase local output without negative consumption effects. If a firm could be expected to gain future profits by training managers and technicians, it should be able to borrow long-term funds to cover the training costs and other losses suffered in its infancy, repayable at maturity. Interest rates should then reflect the social rate of return on capital. Infant industry assistance could thus be viable when capital markets do not function efficiently. When capital markets are not perfectly competitive, firms have to pay more than the social rate of return or are unable to secure loans in the first place. But then government-assisted loans to infant industries would be better than to protect or subsidise output. Subsidised training would also be better than imposing tariffs.

LDCs can try to protect their markets against cheaper labour abroad. When labour in a LDC is less productive but wages are equal world-wide products of the LDC would be more expensive. Wages in the LDC will first have to decline before they would be able to specialise and compete internationally. Wages should however, always reflect its efficiency. Wages in Africa are lower but so is their productivity (see World Bank, 1999). In the HO model the opening of trade reduces real wages whether measured in terms of export goods or import competing goods. The same happens when tariffs decline. Free trade has large gains but also entails adjustment costs and permanent income losses suffered by some. Provision should be made to compensate or help those that suffered.

Adam Smith (1776:478) stated that some industries, like national defence production should always be protected, but it is unwise to produce something if it could be bought elsewhere at a lower cost. Tariffs increase local prices. This would raise local production but discourage local consumption. Welfare would decline through the consumption effect. National defence should rather be paid through

everyone's tax and not by only one group of consumers. In this case a subsidy would be better as it does not disturb consumer choice and influence demand.

When one country pays another a bribe not to impose a tariff it would decrease that countries welfare and also global welfare less than a tariff would have done. But although this could be a first-best policy option, no such option is usually available due to national self-esteem (Kenen, 2000:197). Everything costs money even nationalism.

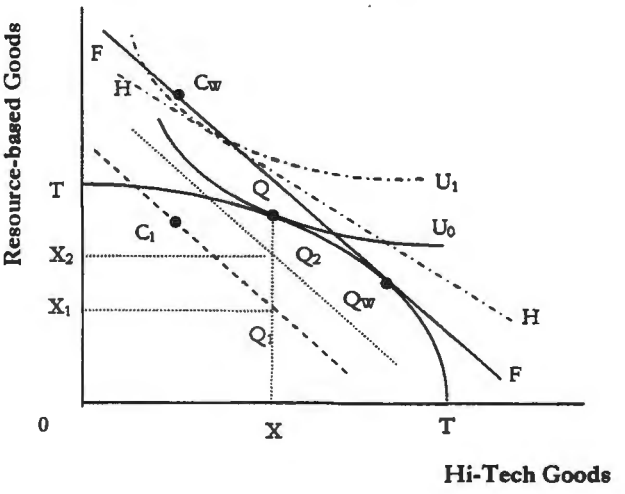
A tariff on a product may increase the price and wages for that product, possibly also the returns on land and natural resources. It may however lead to a decline in the production and consumption of other products as people only have a set budget causing lower returns on capital. Tariffs could thus be used to change the income distribution of a country, but still it is second-best policy.

When the price of a commodity raises, when a tariff is imposed for example, the HO and Stolper-Samuelson theorems shows that the remuneration of the intensively utilised factor of production factor will raise. The price of resource-based goods in LDCs is constantly declining, which means that wages has to decline too while the return on capital is improving. But LDCs do not have enough capital and have an abundance of unskilled labour. This implies that higher capital formation could raise the welfare in LDCs. This will however only work when production factors are totally mobile, which is often not the case in LDCs – an aspect that industrial policy should also consider. LDCs have a shortage of capital and their tastes (and thus demand) also differs from that of developed countries. The wealth creation process will thus take a very long time. It thus seems that tariffs could help the poor, but it was already shown above that in fact tariffs only favour owners of capital and harm labour. It was shown that tariffs decrease the slope of the terms of trade line pushing consumption to a lower indifference curve, thereby decreasing welfare. A better way to improve a specific group is to lower their tax and increase the tax of others. This would not disturb production patterns and will keep welfare at its free market level.

LDCs mostly specialise in resource-based goods while the demand for such products are relatively declining world-wide. With a lower demand, production will have to decline and the demand for labour will also decline pushing the wage rate down. With a decline in demand some people will loose their jobs, but when wages are rigid even more would be unemployed. Figure 2.20 shows equilibrium to be at Q before trade started where the PPF (TT) is tangent to indifference curve U_0. When trade opens, the price line moves to FF with a steeper slope. The relative price of technology-based goods has thus increased. With flexible wages, production would move to Q_w where output of technology-

goods is higher and output of resource-goods is lower, and a reallocation of labour follows. The country will trade along FF probably at Cw on a higher indifference curve.

Figure 2.20 Tariffs and Rigid Wages



When wages are rigid however, the country would not be able to raise output. Production of technology-goods will remain OX, but the output of resource-goods would decline to OX_1. The new output would be at Q_1, which is lower than indifference curve U_0, implying lower welfare. This means that when wages are rigid, free trade would reduce welfare (Kenen, 2000:203). A tariff on resource-based goods could raise its price and increase the demand for labour in the resource-based goods industries leading to a rise in output of these industries from OX_1 to OX_2 and output at Q_2. The LDC will now trade at C_2, where indifference curve U_1 is tangent to the price line HH reflecting the effect of the tariff on the relative price of technology-goods. The indifference curve U1 lies above UO implying higher welfare. This illustrates that a tariff can transform a welfare loss into a welfare gain.

Trade barriers can also be of an advantage to a country if the tariffs designed to protect local firms from imports leads foreign firms to locate in the local economy. This happened during the 1960s after the establishment of the European Union when United States (US) firms erected plants in Europe to serve the European market, and in the 1980s when Japanese firms began to manufacture motor vehicles in the US after the US restricted the number of motor vehicles that could be imported (Kenen, 2000:167).

Tariffs and import restrictions are only one theoretical possibility to enhance profitable production and trade and is often second best policy. Import strangulation can, however, lead to shortages, diseconomies and bottlenecks and countries might suffer growth and development if they cannot obtain the necessary resources. Modern technology is also obtained abroad by LDCs and if they try to function in isolation it cuts them of from that necessary technology. The next section will therefore consider the importance of imports in industrial development.

2.3.6 The Role of Imports in Industrial Development

Imports indicate the existence of local demand in LDCs and show where such demand is located. It also creates new demand as consumers discover new products and imports then also establishes new markets. Unfortunately, imports often focus on luxuries and commodities that are expensive and not conducive to the country's level of development (Meier: 1995:254). Imports explore and map-out a country's demand. It removes uncertainty and lowers transaction costs as markets develop, leading to the point where local production can start economically. The minimum operational plant size and other local factors jointly determine the local production threshold.

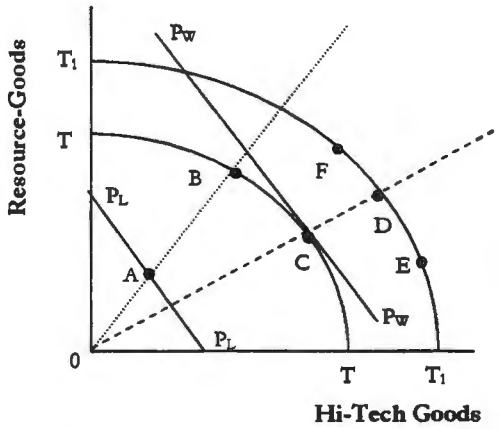
As imports indicate the location of local demand, countries tend to develop comparative advantage in the goods they import (Hirchman, 1978:122). The international division of labour is constantly changing and new commodity flows will continuously emerge. International trade flows play an important role in inducing these shifts. When import volumes of commodity X grow faster than Y, local production of X is likely to begin long before Y.

As imports induce new tastes and technology imports fulfil the function of demand formation and demand reconnaissance for LDC's firms; foreign direct investment usually also follow. Industrial policy could thus rather promote imports. Where the potential exists, entrepreneurs would take up the opportunity, but countries should not try and manufacture something themselves which they can import at a lower price as this is a waste of resources. Import substitution eventually reaches diminishing returns. Import substitution opportunities are eventually exhausted and economies become locked-in to high cost industries utilising small inefficient plants (Kenen, 2000:263). It is therefore important for LDCs to find export opportunities. Infant industry protection should thus also not occur during the pre-natal stage of an industry, if applied at all.

Excess demand for foreign goods would lead to an excess demand for foreign currency and access supply of local currency, depreciating the value of the local currency. Such a deterioration of the local currency makes imports more expensive as the value of the local currency is becoming less. A depreciation or even active devaluation of the local currency is however not a bad as it might sound. Depreciation would make local products relatively cheaper to the outside world stimulating exports while curbing imports. This could increase local production leading to higher employment and income to the local economy. Imports have therefore a role to play in the development process but exports are the main creator of wealth and its role will therefore be considered next.

When economies face global competition higher growth rates are usually experienced. Competition is one of the predominating motivations for the adoption of advanced technology. Outward orientated economies are therefore forced to apply more modern and more efficient technology than economies that follow a strategy of import substitution (Naudé, 2001a:24). Trade is also one of the dominating sources of technology transfers.

Figure 2.21 Gains from Trade Liberalisation



The gains from trade liberalisation are illustrated in Figure 2.21, where P_LP_L represents the local price ratio. Production in this two-sector model would be at point A. With liberalisation production will become technically more efficient and move to point B on the PPF. Local prices will now change and come closer to international prices. The price ratio would change to PwPw as the price of technology-based goods increase. Allocative efficiency will require production to move to point C where resource allocation is optimal. The ratio between technology and resource-goods are also higher at point C than at point B. This implies specialisation towards technology-goods that are internationally more tradable than resource-goods. In the long-run this could lead to an outward shift of the production possibility frontier to T_1T_1 moving to point D. Production would probably rather move to point E or F as technological progress is not neutral between sectors and cost savings will differ between sectors, even when relative prices stay constant. Trade, production and welfare will thus be improved through trade liberalisation.

2.3.7 Strategic Trade Policy and Market Protection

Suleman (1998:64) notes that instead of countries basing trade on competitive advantages, substantial trade emanates from advantages of large-scale production, experience and transitory advantages resulting from innovation. Suleman (1998:78) states that *"New trade theory, with its conclusions that modern international trade reflects increasing economies of scale and imperfect competitive markets, are gaining acceptance in the economic profession. The conclusion that this justifies more government intervention, however, has been substantiated by theory"*.

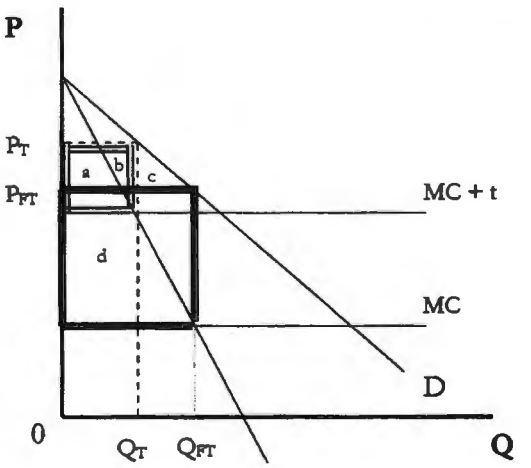
Various models of strategic trade policy illustrate that government intervention can generate favourable results for the local country (Suleman, 1998:67). Strategic trade models illustrate under certain

assumptions that it is possible for governments to improve national welfare by shifting profits from foreign to local producers (Stegemann, 1989:79).

Instigating new market restrictions will induce opposite effects on the marginal cost structures of local and foreign rivals. Marginal costs of local firms will decline as more of its produce are sold in its own market where the foreign competition was excluded. This market exclusion will however, increase the marginal costs of foreign rivalries whose output was forcibly reduced by this market exclusion. Changes in marginal costs structures of both local and foreign firms are changed and this will also have an influence on their sales in unprotected markets. This will enable local firms to expand while their rivalries will have to retreat (Suleman, 1998:71). Krugman (1987) shows that this adjustment process will continues until a new multi-producer Cournot equilibrium is attained. Larger sales and exports by local firms will lead to larger profits and higher welfare levels at home provided that the benefits exceeds the loss in consumer surplus that the market intervention caused in the first place.

Strategic trade policies typically involve the shifting of profits from foreign firms to local firms (Brander & Spencer, 1985:83). In this way national welfare can be improved although it is often at the expense of foreign countries. The positive effect of strategic trade policy can be illustrated with the aid of Figure 2.22. The tariff will raise the cost of supplying the product to the domestic market by exactly the amount of the tariff. We can represent this in the adjoining diagram by shifting the marginal cost curve upward by the amount of the tariff to MC + t. The monopolist will reduce its profit maximizing output to QT and raise its price to PT. Note that the price rises by less than the amount of the tariff (Brander & Spencer, 1985:86). Although a tariff can raise national welfare in this case, it is however not the first-best policy to correct the market imperfection. A first-best policy must attack the imperfection more directly. The standard way of correcting market imperfections like this monopolistic supply in a local context, is to regulate the industry. The local government could set a price ceiling equal to the firm's marginal cost in production. The economic case against selected protectionism are based on the potential reactions by others in response to one country's protection, the likely presence of superior policies to raise economic efficiency relative to a trade policy, information deficiencies which can

Figure 2.22 Illustrating Strategic Trade Policy



inhibit the implementation of appropriate policies and problems associated with lobbying within democratic political systems (Krugman & Obstfeld, 2000:282).

The following section gives a critical analysis of the arguments for industrial policy and investigates some of the practical limitations of industrial policy.

2.3.8 Critical Analysis of the Arguments for Industrial Policy

In section 2.2 it was shown that the objective of industrial policy is to move the macroeconomic supply curve to the right and in that way capture a larger share of the global market. As the macro-supply curve is the sum of individual marginal cost curves, industrial policy should aim at shifting individual marginal costs down, enabling firms to compete internationally as they can supply to the market with more efficiency, at lower prices and better quality as their cost structures improve. Industrial policy can also improve resource allocation, address factor intensity and promote the technological level of advancement, leading to higher factor productivity. In this way the production possibility frontier of the country will expand, indicating higher levels of production and employment, implying better living standards. As international competition increases, more opportunities become available to local industries leading to industrial development. Some local firms will, however, become unprofitable and many jobs will be lost. The following sections consider some of the criticism and negative implications of industrial policy, which policy makers should keep in mind when designing industrial development policy.

2.3.8.1 Static versus Dynamic Effect of International Trade

Government intervention could decrease the advantages of international trade, but when an industrial policy step is deemed necessary it will also lead to secondary economic development due to the dynamic effects it can cause. There are linkages between the different economic agents in the economy and stimulation of one industry will have an influence on others. Hirschman (1978) already advocated a big push in only a number of selected industries. The aim had to be specific to skew the economic industrial sector - and to unbalance it. The reason for this, according to Hirschman, was that when development in certain key sectors received preferential treatment, it would establish over-capacity in that sector and cause supply bottlenecks in other sectors. This disequilibrium would then lead to actions and reactions that would nudge the developmental process because in effect it would create profitable opportunities for entrepreneurs to utilise.

An example to illustrate Hirschman's theory is the deliberate over-supply of electricity. This causes the price of electricity to go down, so that those sectors of the economy, which use large amounts of electricity, such as the mines, for example, could be stimulated to increase their output. In this case the

electricity sector is the upstream industry and mining the downstream industry. The issue as to which of the industries should be over-invested in should be decided on the basis of the number of forward and backward linkage effects which will exist between a specific industry and the rest of the economy. It is therefore the task of the government's industrial policy to see to it that unbalanced investment should be done in such sectors where linkages could be maximised.

Hirschmann (1978) further states that the existence of linkages can require investment in large-scale capital-intensive industries seeing that the total employment effect of such investment can be greater than investment in small businesses and small-scale, labour-intensive industries (Hirschmann, 1978:154).

Linkages and successive stages of increased demand following expanded trade will lead to the multiplier effect causing more dynamic effects that are not immediately visible. Industrial development planning should take note of the dynamic effects of policies and ensure that further development of an initial policy step would yield advantages, and not be to the detement of local industry and labour. The following section specifically considers the effect of increasing global trade and globalisation on factor mobility, the poor and unskilled.

2.3.8.2 Factor Mobility and Industrial Development

It was shown above that international trade raises everyone's wealth and could raise global welfare, but it should be noted that the strong assumptions made by Classical economics and especially those of the HO Theorem have direct consequences and let economics favour free trade (Kenen, 2000:155). This makes conclusions about factor mobility impossible and restricts the applicability of the HO model. Relaxing some of the HO assumptions enables the study of factor movement (Geenaway & Winters, 1994:26), which could be valuable when designing and evaluating industrial development policy.

When easing the HO assumptions it is noted that tariffs can prevent markets from uniting, and marginal products and factor prices to equalise. Capital mobility will also occur due to differences in real earnings, and even eliminate trade completely. If a capital-abundant country increases the price of labour-intensive products through a tariff, more of the labour-intensive product would be supplied. This would lead to firms becoming more capital-intensive as more labour is attracted away to labour-intensive industries. The excess supply of labour-intensive products would decrease its prices, especially in the labour- abundant country. This will cause LDCs to produce more capital-intensive goods and use less labour. Eventually this will reduce the gap in intensities, as well as differences between marginal products and reduce the differences in real income between countries and products.

The real returns on capital would decline in the developed world and capital would move to LDCs increasing their capital stock and decreasing the stock of developed countries (Kenen, 2000:155).

When owners of capital react strong enough on the gap in the real earnings of capital, capital would continue to flow to LDCs until that gap disappears. There are however, differences between marginal products, factor intensities, relative price of labour and prices of products. When these relative price differentials disappear trade would stop. This implies that trade and factor endowments are substitutes. Difference between factor endowments in lDCs and the developed world are however so large that the transfer of capital would never lead to the elimination of trade. A tariff in the developed world will favour LDCs as it promotes capital formation in capital-poor countries. When tariffs prohibit the movement of market goods, it is supplemented by the mobility of production factors. The Haberler theorem states that the price of the production factors utilised will rise when the price of the products it produces increases (Haberler, 1961:222 & Kenen, 2000:90). A tariff on technology-based goods in the developed world would reduce the demand for capital and the price thereof, while wages would rise. In the capital-poor country this would, however, lead to lower wages and higher yields on capital. This implies that a tariff on agricultural products in the developed world would lead to higher wage rates in LDCs.

Factor intensity of a product depends on the price of the production factors employed. When wages are low, steel might for example be manufactured using labour-intensive technology, but at higher wage rates the producer might decide to change to capital-intensive technology. Higher wages will increase the price of labour-intensive products more than capital-intensive products. A change in factor prices could thus lead to factor reversal. Free trade could equalise factor prices, decreasing factor mobility, but a shortage of production factors could hamper the process.

When wages are low, developed countries might also decide to import steel because they have more capital per worker and steel is capital intensive. For the same reason LDCs would also wish to import steel, but this would not be possible. When factor reversal is possible free trade would not be able to equalise factor prices (Kenen: 200:159). Very low wages in LDCs will however, still cause capital-intensity in steel production to be higher than in agriculture. When wages rise in developed countries the capital intensity of agriculture might rise relative to steel production. Capital-intensity will however remain higher in the capital-abundant industrial countries. The marginal product of capital in developed countries will thus decline decreasing its real return. This implies that free trade would not equate the price of production factors (Armstron & Taylor, 2002: 88 & Kenen: 200:159).

When wages are low in a labour-abundant country, capital would be produced more capital intensively than agriculture, while the same would be the case in developed countries if their wages are high. The capital-intensity of both products would, however, still be higher in the capital-abundant developed countries. This leads to lower marginal products and revenue on capital. Free trade would thus also in this case not lead to equal factor prices and capital will still flow to capital-poor countries due to the higher yield in LDCs. Capital movements will continue as long as there is a difference in earnings between countries and factor reversal is possible. This will be the case when a product is more capital-intensive in all countries. Then the country with the most capital will specialise in the production of that product and the capital-poor country will specialise in labour-intensive production like agriculture. Free trade maximises international efficiency because it moves towards equal factor prices.

As the production of agricultural goods in developed countries is more capital-intensive, it would reduce the country's capital stock while the production of labour-intensive goods would decline. According to the Rybczynski Theorem this would increase the production of steel. If the production of steel is at the same time also capital-intensive in LDCs, an increase in their capital production will lead to a decline in the production of agricultural goods. Capital transfers to LDCs will thus cause higher relative agricultural prices. When capital increases in all countries, the rise in capital-intensity of the agricultural sector would rise more that that of the steel industry in all countries. This would raise the price of agricultural goods and the demand for capital goods while wages decline relatively in all countries. On the other hand, if capital stock declines in all countries, agricultural production would become less capital intensive than steel. This would lower the price of agricultural goods relatively and wage would increase in all countries. Capital transfers could, however, still benefit workers in the LDCs. Population growth has an effect on the relation between capital and labour, the formation of capital and factor mobility and it can nullify most of the advantages of capital formation and mobility (Thirlwall, 1999:154). The consequences of population growth and other factors are considered next.

2.3.8.3 Population Growth Industrial Development

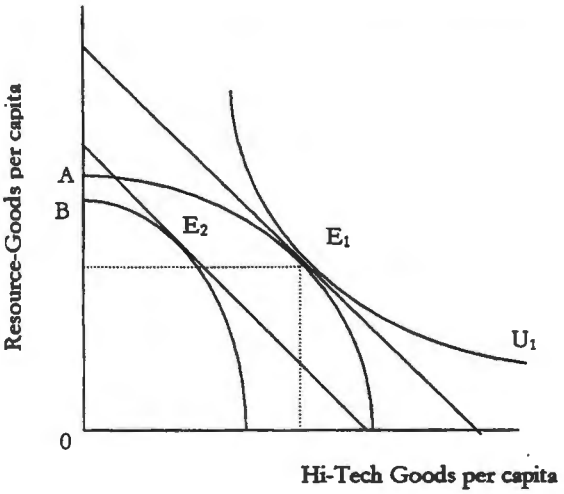
This section discusses the effect of population growth on capital formation and industrial development. When the labour market expands in a country producing labour-intensive goods like a LDC, the supply of labour-intensive goods will increase and the supply of capital-intensive goods would decline according to the Rybczynski and Stolper-Samuelson Theorems. As the supply of labour-intensive goods increases its relative price will decrease the terms of trade of the LDC would deteriorate. But the yield on capital would rise in all countries and wage rates would decline. As the wages of consumers decline they have less income and per capita welfare in the country will decline. When the labour supply rises while capital remains constant the rise in national income would be less that the increase in consumers (labourers) causing people's income to decline. This implies that

population growth in a LDC would increase the labour supply and export growth would then be a zero gain (immiserising growth). Welfare would decline, the terms of trade then declines and consumer income decreases. As the terms of trade of the developed world would rise, simultaneously their welfare would improve.

Capital formation would shift the PPF production curve out. If the price ration in a closed economy stays constant, per capita income would increase relatively measured in resource-based goods. The Rybczynski Theorem states that an increase in the supply of a factor of production would lead to an increase in the supply of products that utilises that production factor. As capital increases, the supply of technology-based goods will thus also rise while that supply of resource-based goods would decline. This would be on a higher level of indifference, implying higher welfare to all consumers. More resource-based goods are also demanded, but as the supply of resource-goods did not increase, its price will rise and consumption thereof will decline. The higher demand for capital-intensive technology-based goods is fulfilled the more technology-goods would be consumed.

With high population growth per capita, production would decline and this is illustrated by an inward shift of the per capita PPF production curve in Figure 2.23. Real per capita income will then decline from OA to OB. Consumption will move to a lower indifference curve. According to the Rybczynski Theorem production and consumption of resource-based goods are supposed to increase but immiserising growth takes place as technology-goods decline more than resource-goods can rise. This demonstrates that population growth can decrease welfare. If these two growth rates are equal and balanced, more inputs will have to be imported and the country's offer curves will shift outward and the terms of trade will deteriorate. Even at balanced growth welfare will thus decline (Kenen, 2000:121). It is therefore essential that capital formation and the ability to apply the technology that this new capital utilises most productively would increase to such an extent that it would neutralise the negative effects of a too high population growth and lead to higher welfare. The net shifts in the PPFs and the indifference curves have to be ultimately higher. Growth in capital formation should thus exceed the population growth rate. Industrial

Figure 2.23 The Effect of Population Growth



development policies must therefore not only focus on new capital formation but also include policies to curb the population growth rate and other dimensions of development.

The following section considers the effect of increasing global trade and globalisation on the poor and unskilled.

2.3.8.4 Poverty and Industrial Development

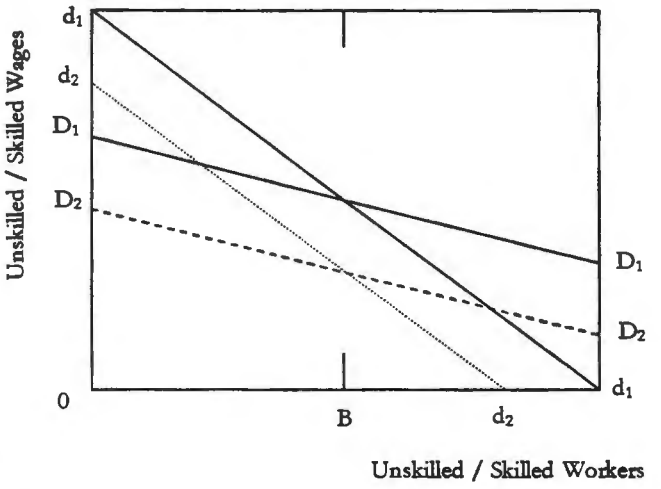
Since the late 1980s increasing international due to trade-orientated industrial policies could have harmed unskilled labour in various countries and the wage gap has deteriorated. In studying the effect of trade on wage differentials, a large difference is found between the experience of East Asian countries during the 1960s and 70s and that of Latin America since the late 1980s (Wood, 1998:1479). Latin America is better endowed by natural resources than the Asian countries but they also differ in their trade policies. Korea and Taiwan gave large incentives to exporters, while maintaining high levels of protection against imports, for example. Opening of trade in Latin America occurred, however, in the spirit of the General Agreement on Trade and Tariffs (GATT), involving large reductions in import barriers (Wood, 1997:48). The outcome of these policies caused a marked difference on the skill composition of the demand for labour. When import barriers declined uniformly in Latin American countries that specialised in labour-intensive sectors, unskilled workers were harmed more than skilled workers.

The entry of large volume of low-income counties into the world markets during the 1980s caused a shift in the skill bias of technology. The increase in the effective relative world supply of unskilled labour lowered the relative world price of unskilled labour-intensive goods and altered the position of the open market demand curve. This can be shown as a downward shift of the horizontal segment of the demand curve DD in Figure 2.20.

One main reason why wage difference between skilled and unskilled labour deteriorated since the 1980s is due to the fact that world technology has changed and increasingly demands skilled labour, while the demand for unskilled labour is declining (Wood, 1998:1478). Modern trade is therefore also called *"skill-enhancing trade"*. Increasing openness due to industrial policies may affect the skill structures of less developed countries by altering the sectoral composition of production, like the HO Theorem predicts, and by changing the production technology that is available. The available technology is increased through the imports of advanced capital goods and exporters are exposed to foreign markets and learn from foreign buyers. The net impact depends on the size of these influences and the nature of the difference between local and international technology.

Figure 2.24 illustrates the skill-enhancing trade explanation of Wood (1997:54) where there are two pairs of closed-economy and open-economy demand curves. Demand curves d_1d_1 and D_1D_1 represents 1960 technology and d_2d_2 and D_2D_2 represents technology utilised since the late 1980s. It is assumed that technology have changed over time in a biased manner that requires generally a lower ratio of unskilled to skilled labour. It is also assumed that modern technology is only available to open economies. Countries that remained closed to trade over this period still have to use 1960 technology. When opening trade, most LDCs (to the right of point B) experienced different effects on wage inequality in the 1960s compared to the 1980s. In the 1960s wage inequality would have declined, moving from d_1d_1 to D_1D_1, while wage equality would have increased during the 80s, moving from d_1d_1 and D_2D_2. The HO tendency to reduce inequality when trade opens up still occurred but the effects of changing technology, causing a net increase in wage inequality, dominated it.

Figure 2.24 Effect of Openness and Technological Change



Skill-enhancing trade led to a bias in favour of skilled labour as the technological progress since the 1980s utilised skilled labour at an increasing rate. This led to a decline in the demand for unskilled labour and a decline in its wage rates. This is also the case in the developed world (see Wood, 1995:57). Wood (1997:53) also indicates that research done by Robbins (1996) found a positive correlation between the relative demand for skilled labour and the rate of growth in the GDP. The discriminatory effect of global trade against unskilled labour would lead to a decline in the living standard of the people that are less educated.

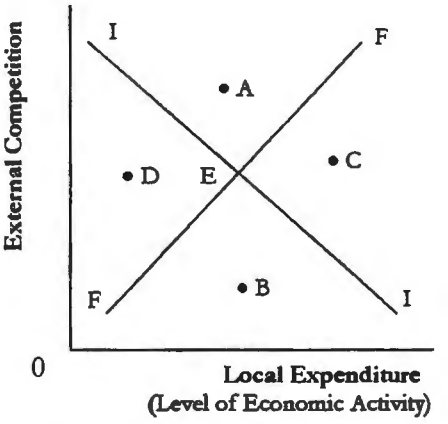
2.3.8.5 Efficiency versus Equity in Industrial Development

Industrial policy may not necessarily lead to economic growth, efficiency and equity simultaneously. Weiss (1996:260) and Williamson (1993) stress the merits of the free market mechanism in achieving efficiency and equity. Unfortunately these objectives cannot always be attained simultaneously. The objectives are usually in excess of the available instruments requiring an optimal combination of policies, and even then all objectives will not be met. In rural villages people might suffer from hunger

and underdevelopment, but they may not prefer industrial development and pollution in their district, but rather a tourism venture that would increase their income without adding air and noise pollution.

This trade-off between objectives is shown in Figure 2.25 where curve I I represents internal balance in a country, representing by the combination of local expenditure and international competitiveness. It is downward slopping because expenditure comes at a price. At point A there is an internal imbalance typical of an excess demand during an economic boom. Point B represents excess supply during a recession, as expenditure for a given level of competitiveness is too low to maintain internal equilibrium. Curve FF represents the combination of economic activity, following industrial development policy steps (expenditure) and competitiveness, which gives external equilibrium. Points above FF, like D, represents an excess supply of foreign currency implying a balance of payment and a trade surplus. Points below FF show excess demand for foreign currency. Four different economic states are represented in the different segments. An economy in the segment including A, has a boom and a balance of payment (BoP) surplus. An economy at the segment including C has a boom and BoP deficit; at the segment including B has a recession and a BoP deficit and an economy in the segment including D experience a recession and a BoP surplus. Only at point E are internal and external equilibrium reached simultaneously. (This depends however, on the validity of the trade-off assumption).

Figure 2.25 Expenditure versus External Equilibrium



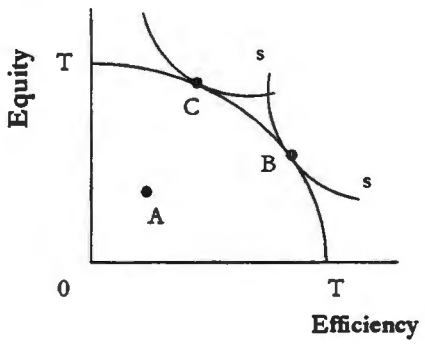
Industrial development of LDCs could thus attempt to move their countries towards point E. They are typically at point C where there are an excess of internal activity and an excess demand for foreign currency. A movement from C to E would require a simultaneous improvement of external competitiveness and a reduction in local activity. Macroeconomic policy would thus need to be consistent with the goals of industrial policy. This requires tighter fiscal and monetary policy, decreasing the budget deficit as well as exchange rate adjustments. Expenditure reducing and expenditure switching policies would be necessary.

As the terms of trade deteriorate the price of imports would rise relative to export prices. This should lead to devaluation, shifting curve FF in Figure 2.25 up with less favourable conditions for a given level of expenditure, which requires more depreciation. Internal and external equilibrium would than require

a real depreciation and a fall in expenditure. Favourable external factors like an improvement in the terms of trade or higher foreign capital inflows would in contrast have a reverse effect. This also indicates why foreign direct investment (FDI) and high interest rates are so important. Higher FDI will increase local expenditure, leading to higher income, larger production output and more employment where this higher output is produced.

The trade-off between equity and efficiency is illustrated in Figure 2.26 where TT shows the combinations of real income as a measure of efficiency and income distribution as a measure of equity. This implies a trade-off assumption between equity and efficiency. At point A the country is operating at a macro-economic imbalance and micro-economic inefficiency. Government policy should improve efficiency to reach point B on the frontier TT. At B real income will be higher for a given equity level and everyone will be better off. The ideal is for the government to achieve a higher growth path so that TT would move outward in the long-term.

Figure 2.26 Equity versus Efficiency



Considering the social welfare function SS, achieving point C would improve equality but at a cost to income and efficiency. The final optimal outcome should be on TT but tangent to a social welfare function in accordance to that society's preference. Government should ensure that equity is not sub-optimal (Weiss, 1996:15). It is always important to make a proper cost-advantage analysis when designing industrial development policies.

The following section considers the competitiveness platform and how the different elements in a country can contribute towards industrial development.

2.4 THE INDUSTRIAL COMPETITIVE PLATFORM

The competitive platform embraces all aspects relevant to competitiveness that enables firms to compete. It includes government policies, the quality of human capital, level of technology in the country, and factors that enable firms to prosper and grow, among others. Competitiveness ensures the demand for goods and services. It yields profits and growth to companies, the creation of employment, growth and rising living standards for country's people (Sunley, 2003:192). Competitiveness is the ability to deliver products or services to the market at lower prices than any

other competitor, without suffering opportunity costs. Competitively can also be due to the supply of better quality, but this implies that it would cost other competitors more to supply a homogeneous product of the same quality to the market. According to the new economic geography the competitiveness of companies in the modern economy depends on superior efficiency in production management, marketing and innovation (see chapter 3 section 3.2.2). This broadens the scope of competitiveness to include other factors that would support superior price and quality achievement. In this regard, competitive advantage depends on a favourable business climate, backed by various factors like structural and macroeconomic policies, infrastructure and skilled labour. In section 2.4.1 the drivers of competitiveness are discussed while section 2.4.2 considers stages of competitive development and section 2.4.3 studies Porter's approach to competitiveness. The empirical study reported in chapter 5 will to a large extent be based on Porter's approach.

2.4.1 Drivers of Competitiveness

Competitive advantage develops from the way firms organise and perform their discreet activities in order to create value in answering to market demand. Firms gain advantage by inventing new ways to conduct activities or by employing new procedures, new technology or different inputs. The way in which activities are performed affects the costs, efficiency and competitively of other activities. The value chain is an inter-dependent system of activities, which requires active management. Competitive advantage is increasingly becoming a function of the efficient management of the entire system, which includes supplier, channel and market value chains (Porter, 1990 & 1998a). These value chains and enhancement there of are increasingly managed with the aid of modern computer and other technology. Firms can then benefit from better organisation and exploitation of linkages within such a value system.

Competitiveness is an industry-specific phenomenon. A region cannot be competitive for all types of industries. Competitiveness of a region depends on its ability to offer a mass of industrial clusters that enables economic activity to reach increasing returns to scale (Porter, 1994). The advantages that a specific region can offer to a particular industry are due to the availability of specialised labour, technology and infrastructure, a sophisticated and demanding local customer base (see chapter 4). Strong competitors in the industrial district or network and the existence of supporting industries such as specialised suppliers and service providers are just as important.

History has shown that industrial growth develops through a life cycle, moving from resource based growth to investment and innovation based growth (also see section 4.5 in chapter 4). In the beginning, growth is initiated by strategies that focus on the production of specific resource-based

products aimed at a small or targeted local market. The creation and exploitation of comparative advantage takes place in this phase. Supplying these products to a larger market requires significant investment and innovation to reduce production costs, increase quality and guarantee reliable on-time delivery. This comparative advantage will only be expanded or maintained and if continuous investment and innovations occur.

Innovation and technological capabilities that can improve the competitive base are expensive and contributes largely to production costs. The future gains are however worth while and in developed economies the ability to utilise investment and innovation more than offsets the low labour costs characteristically found in developing economies. Without investment and innovation, the resource-based comparative advantage remains static and tied to a low growth path. This emphasises the importance of local savings, FDI, research and development. It should also be noted that the development of innovative capabilities evolves more than education and requires experience, advanced institutions, financial instruments and shared resources and institutions.

The development process requires drivers of competitiveness at all levels to be successful. Supranational drivers, which are beyond the scope and control of countries, can either provide opportunities or constrains. The macroeconomic conditions should provide an overall environment for growth while meso condition on the industrial level can provide the necessary skills and knowledge as well as superior inputs and market signals. Micro conditions must provide pressures and incentives in which firms are pushed and encouraged to improve. In the end, firms should develop their own capabilities as they contribute to the development of the economies in which they function. To ensure competitiveness and prosperity the private and public sectors as well as foreign governments, multilateral organisations and multinational firms should all be vital participants in the development process.

Governments strive to create employment opportunities, stable growth, price stability and external equilibrium. Companies however pursue sustainable profits. As globalisation expands, competitiveness of firms is growing in importance above that of country objectives. It is firms that utilise the new opportunities of the new economy and extend supply and distribution chains globally. Simultaneously governments should contribute to an environment in which firms can prosper. In his recommendations on how to raise the economic growth potential and thus competitiveness of nations, Porter (1998a:30) states that *"...a stable political context and sound macroeconomic policies are necessary but not sufficient to ensure a prosperous economy. As important – or even more so – are the microeconomic foundations of economic development, rooted in firm operating practices and strategies as well as in the business inputs, infrastructure, institutions, and policies that constitute the environment in which a nation's firms compete".*

Regions have to take advantage of current trends to generate, retain and attract economic activities that will allow them to prosper. In world of global economic competition, a nation or region should develop some source of competitiveness, at least for some economic activities. Nations or regions will be competitive in an industry if their environments provide favourable conditions and signals for firms to succeed. The development potential of an economy is determined by its ability to foster competitiveness that improves productivity across the economy. It was noted above that competitiveness of industries and the economic development potential of economies depend on five sets of "drivers", *supra-national-level drivers, macro-level drivers, micro-* or *industry-level drivers, meso-* or *cluster-level drivers* and *firm-level drivers*. In general, these drivers are features that provide the incentives, pressures and capabilities for firms to innovate and progress. The importance of the different levels varies between industries (or economies). When the industrial competitiveness is assessed, the question is whether the economy is favourably positioned with respect to relevant competitors of that specific level of drivers that affect the industry under investigation. The same applies for the assessment of the development potential of the economy as a whole. It should be determined is it is favourably positioned with respect to other economies at a similar level of development at that particular level of drivers.

Enright (1990b), who constituted this framework, puts the industry at the centre, as firms need to be actively involved to succeed in the industry. When the focus is on the competitiveness of a given industry within a nation or region, this represents the nature of the industry, including customer tastes, production technologies, geographical scope (whether it is global or local), resource requirements and viable competitive strategies. When the focus is on the competitiveness of an economy, it represents the level and trajectory of development that the economy has achieved.

Supra-national drivers of competitiveness are those that are beyond the scope or control of a nation or region and are increasing in number as globalisation expands. These include the influence of multilateral organisations, supra-national policy-making authorities, trade blocs, foreign Governments, multinational corporations and international financial flows. At each stage of drivers it has to be determined if the orientation is favourable relative to competitors. The competitiveness of industries and the development potential of economies can be influenced by multilateral organisations, such as the UNDP, the United Nations Industrial Development Organisation (UNIDO), the United Nations Conference on Trade and Development (UNCTAD), the World Bank and the International Monetary Fund (IMF) – and even more so in the developing world. The extent to which nations can work with these organisations and benefit from the technical assistance, financing and advice can influence the ability of such nations to compete in a wide range of industries. The World Trade Organisation (WTO)

also sets and enforces rules of conduct for international trade that can similarly influence a nation's ability to compete in a global context.

Trade blocks also influence competitiveness and development potential. They can facilitate the development of exports within the block while potentially limiting those from outside the bloc. Trade blocks require the surrender of some autonomy of individual countries and just like with cartels, incentives to violate agreements are always present. Supra-national policy-making authorities, like the European Union, can influence competitiveness and development potential through competition policies, regulatory policies, and taxation policies, technology policies and transfer payments that are supra-national in nature. The extent to which such policies assist or restrict the development of competitive firms in individual industries or depend on the nature of the policy and the other drivers.

Most theories discussed above assume that labour and capital will take opposite sides as if they were substitutes. The choice between capital and labour intensive technology that is often considered in economic theory might lead to inefficiencies as labour and capital are complimentary to each other in the production process and should be enhanced simultaneously and both utilised in the production process. Barro (1991:407) found that investments in education and physical capital correlate positively. In American industries for example, higher tariffs and protection were favoured both by labourers and industrial owners of capital (Kenen, 2000:226). This is logical as tariffs benefit both local firms and create employment. There exists complimentarity between the factors of production.

Production would not be able to increase through technological progress if the labour is not capable of handling new equipment. With the implementation of modern technology in the production process better skilled labour would also be required. To increase the productivity of capital, the productivity and skills of labour should thus be enhanced. An industrial policy should therefore assist firms in the acquisition of modern capital goods that utilise modern technology, but it should also ensure the training and education of the labour force. Evidence suggests that economic returns to investments in education and health are high and has many positive externalities (Nicholson, 2002:660 & Weiss, 1995:13). Mankiw, Romer and Weil (1992:407) expanded the standard Solow model by including the accumulation of human capital. According to Glenroy (2001:80) *"local enterprises that do not invest in learning cannot expect spillovers to have a significant effect on their efficiency"*. Training externalities will not be significant if the absorptive capacity of local firms is inefficient. Local firms that invest in training obtain additional learning economies over time and achieve comparative advantages in external knowledge exploitation capabilities.

The development potential and competitiveness of an economy can also be influence by the actions of foreign governments. If foreign governments protect or subsidise their industries, it can be difficult for an economy to develop or exploit its own potential sources of advantage. On the other hand, preferential access, aid programmes and transfer programmes of knowledge can contribute to the development of industries and economies.

Trans-national companies (TNCs) can also be drivers of development with a scope that goes well beyond that of most developing nations or even most nations. The strategies of multinational firms, whether they decentralise or centralise their activities, locate activities in low labour cost regions or high labour skill regions, or enter new markets through exports or foreign direct investment – all influence the economic activities of nations or regions. History has shown that multinational companies can be extraordinarily influential in the development of resource-rich economies and can be decisive in the development of even quite advanced economies such as that of Singapore. Foreign multinationals can provide technology, expertise, capital and access to markets for developing nations and peripheral regions (Naudé & Kleynhans, 2002:40). Such firms often have an impact that goes well beyond that of the systems that might exist in an economy.

Increasing international financial flows that build up local skills and capabilities benefit many nations as globalisation progresses. This increases the availability of debt and equity capital from foreign banks and investors sharply, reducing the constraints of insufficient indigenous capital. These flows enable projects with good prospects to find funding easier than ever before. On the other hand, certain types of international capital flows, in particular short-term debt and portfolio equity investments, can easily be repatriated, creating or aggravating the volatility of emerging markets.

Competitive drivers on the macro-level can be divided into macroeconomic conditions, macro governmental policies, macro institutions and civil society and, have important impacts on the competitiveness of industries and development potential of economies. Relatively stable macroeconomic conditions have proved to be a virtual prerequisite for sustained growth and development, while macroeconomic imbalances can have a devastating impact on the competitiveness of a nation's industries and the development potential of its economy. Macroeconomic conditions include aggregate demand, fiscal balances, inflation and interest rates, exchange rates and unemployment.

At this same national or macro level, government policies are also critical to an economy's competitiveness and development potential. Most important are those policies which affect the economy, such as natural resource policies, industrial development policies, monetary and exchange

policies, fiscal policies, policies towards trade and investment, policies that influence entry into and competition in industries, regulatory policies and taxation policies. Other policies that influence competitiveness and development potential indirectly include overall policies toward education, training and government support industries.

An economy's ability to build competitive industries and have high development potential often depends on the strength of its institution. The most important macro institutions that have an impact on competitiveness and development potential are:

- Design institutions – which design policies and programmes that affect the whole economy
- Support institutions – that create or supply inputs, skills and capabilities for the economy as a whole; like educational, training, research and financial institutions
- Governance institutions – that provide and enforce rules in the economy. Markets cannot function without a legal regime that allows for the creation and enforcement of contracts, and legal institutions are important in providing the overall framework in which firms and the government can operate.

Another important factor that influences the ability to formulate and execute policies and strategies that affect the economy is the nature of civil society, and in particular the social structures, agendas and cultural attributes of nations. Economic activity requires social stability. Nations with a history of social strife or without sufficient social cohesion find it difficult or impossible to engage in successful development efforts, or to enact and enforce the rules of conduct necessary for an economy to prosper. This is particularly true of most African countries. Since the Second World War Africa experienced a disproportional share of regional conflicts compared to other regions in which more than 21 million people had died (Naudé & Kleynhans, 2002:133). Approaches to competitiveness that focus only on industries will fail when this aspect is ignored. The cultural norms and agendas of individuals, firms and interest groups that influence the importance placed on wealth accumulation, determines attitudes towards work, competition and the international economy. This in turn influences competitiveness in industries and the development potential of the economy as a whole.

On the meso-level the competitive drivers are those that operate at the level of related sets of industries or clusters. Clusters are sets of firms in the same or closely related industries while regional clusters are geographically concentrated clusters. The two terms are often used inter-changeably. Clusters are usually sets of industries in the production chain that are sufficiently related to enjoy significant spill-overs and economies of scope. It includes inputs that are available to local firms, the type of demand seen by local companies, the nature of competition and co-operation found in the

economy, the ability to share resources and to share activities across related industries, complementarities among industries, meso-level policies and meso-level institutions.

Superior access to inputs, such as land, labour, capital, infrastructure, knowledge, technologies, raw materials, produced inputs, capital equipment, support services and ecological inputs relevant to an industry could provide a distinct source of advantage to firms. When critical inputs cannot readily be found at reasonable prices it would restrict an industry or an economy. Demand conditions provide important signals to firms. Access to large, sophisticated or specialised demand can provide specific advantages for a county's firms. When these characteristics are absent from local markets, it can be obtained through links from foreign demand, agents, or foreign multinationals.

Clustering involves firms in the same and related industries to locate close to each other. Clusters that are successful go beyond simple supplier-buyer or competitive - co-operative relationships. Self-sustaining clusters have developed resources, skills and capabilities beyond that of single firms. This occurs when resources and activities are shared across firms and industries. It can involve a local pool of skilled labour from which multiple firms draw upon, the emergence of third-party specialist suppliers and the development of cluster-specific research organisations. (See also the theoretical chapter 3 on clusters, industrial districts, flexible production and economies of scope). The presence or absence of complementary industries in a particular location can assist or obstruct competitiveness. Complementarities occur when one industry contributes to the development of another industry. Some examples include computer hardware and software, or roads, automobiles and auto parts.

Meso policies and meso institutions are geared directly towards clusters of firms in closely related industries. There are several institutions that operate at the cluster level and they can even take the form of specific cluster organisations. Similar to the macro-level there is an increasing focus on the development of design institutions, which design cluster initiatives. Support institutions support the activities of clusters, while governance institutions govern the interaction among firms and other institutions associated with clusters. These institutions often involve groups of firms in related industries, local authorities, universities, research organisations, financial institutions and community organisations.

If *industry-specific* factor is lacking in a region the problem can be rectified through the presence of supporting industries if industrial "clusters" exist. (See more on clusters and agglomeration in the theoretical chapter 4). Clusters are therefore also an important determinant of competitiveness in a region. Much research has gone into the establishment and nurturing of clusters in regional development policy in recent years.

The ideas of new economic geographers centres around increasing returns to scale, caused by agglomerational advantages and economies of scale and scope, which are present in clusters of economic activity. In this sense competitiveness of a region may boil down to its ability to offer a mass of clusters and economic activity for increasing returns to scale. The availability of skilled labour and intermediate inputs, knowledge and technology spill-overs, access to markets, access to reliable suppliers and supplying to customer needs as explanation of competitiveness are rising in importance in the new economic geography. The new economy is a knowledge economy driven by information and communications technology. Through technologies such as the internet, truly global markets have been created and transaction costs significantly reduced. The new economy therefore suggests the competitiveness of a region or relevance of its institutions and entrepreneurs to invest in and utilise the new economy.

At the micro- or industry-level drivers involve features that are specific to the industry and firms itself. These features include the nature of competition and co-operation among firms, the strategic groupings found within the industry, the role of leading firms, and micro-level policies and institutions. Micro policies and institutions are geared towards a specific industry. Micro policies can include targeting and other industrial policies as well as the provision of industry-specific infrastructure, education or training.

The absence of competition often leads to inefficiencies and waste. Competition among local firms is necessary for those firms to improve and develop. Scale-sensitive activities such as provision of infrastructure, education, training, market intelligence, technology scanning, export promotion, bulk procurement and basic research can be fruitful targets for co-operation and collaboration among firms in an industry though, in particular if the industry is populated by small and medium-sized firms.

Strategic groupings involve firm strategies and organisations found within the country or region within an industry. Leading firms often have a disproportionate impact on the competitiveness and development potential of an economy. The extent to which the major groups of firms are following strategies that are viable in the industry and favoured by the local environment will influence the industry's competitiveness. Foreign multinationals can also be leaders. Sometimes leading firms play a disproportionate role in the development of an industry or an economy. Micro policies are sometimes subject to governments picking winners and the escalation of investment as success becomes a political imperative.

Micro institutions can include industry associations, agricultural co-operatives, industry-specific educational or training institutes and industry-specific financial organisations. Favourable conditions at the other levels are supposed to lead to competitiveness and economic development at firm level. The positioning of local firms; their activities, resources and knowledge that support the positioning; corporate strategies; and systems of corporate governance are particularly important in the context of a country's position in the global economy. Industry competitiveness depends on its favourable positioning in relation to competitors at firm-level and their ability to improve and progress.

Corporate governance can strongly influence the strategies and organisation of firms. These systems influence the behaviour of firms and managers. Governance systems that reward innovation and improvement are most likely to foster competitive industries and high development potential. A research friendly atmosphere is also import for sustained economic and competitive development. Special relationships and non-transparency should be avoided.

2.4.2 Stages of Competitive Development

The importance of competitive firms in a country is emphasised by growing globalisation as companies extend global supply and distribution chains to utilise new and existing opportunities. Governments have to strive towards objectives like balanced growth, the creation of employment and an effective competitive platform, while companies are pursuing long-run sustainable profitability. Sustainable profits create growth, employment and international competitiveness. Successful economic development is a process of successive upgrading as a country's business environment expands to support increasingly sophisticated and productive ways to compete (Porter, 1999:31 & 33). Michael Porter (1998a) argues that, notwithstanding the diversity of economies, there is a clear-cut emergent pattern of development. The competitive development of a country goes through various stages that are factor, investment, innovation and wealth driven respectively (see chapter 8 for an application on South Africa).

The factor-driven stage is characterised by natural-resource-intensive activities like agriculture, mining, and labour-intensive manufactures. Sub-Saharan Africa, with the possible exception of South Africa, fits into this category, and none, except Mauritius, has yet managed to move from natural-resource dependence to labour-intensive manufacturing.

The second stage is the investment-driven stage, which is associated with the manufacturing of intermediate and capital goods, especially heavy and chemical industrialisation. Sub-Saharan Africa has yet to reach the innovation-driven stage, and only South Africa has attained investment-driven status.

Innovations are crucial in the development of new procedures, applications, technology and ultimately a higher competitive platform.

It is not foreseen that African countries would be able to move out of the first stage in the near future. At the start of the third millennium location and clusters could exert an influence, especially since the signing of the 1999 South Africa-EU free trade agreement, with prospects for sub-contracting and cross-border vertical-integration spin-offs for other Southern African economies within SADC. In the longer run similar, but smaller spin-offs might arise from the future development of ECOWAS, the East African Co-operation agreement and COMESA. It will, however, still be a while before economic integration like the EU as visualised by the Africa Union and SADC would be realised (Flint, 2001:30). Such spin-off effects will only materialise where governments and firms succeed in building competitive advantage in the face of the envisaged challenge, especially with regard to labour-intensive manufacturing.

Sources of competitiveness are most often either due to low cost leadership or due to product differentiation. Competitiveness can stem from advantages in low input costs, effective supply chains, or the productive use of factors, or it can be from innovation, quality and brand image and/or niche markets. The new economic geography also emphasises this new approach to production, marketing and innovation (see chapter 3).

Traditionally, competitiveness is obtained through design, produce and marketing of a comparable product in a more efficient way than competitors, which leads to superior returns at price, which are at or near those of competitors. Gaining cost advantages also requires optimising linkages among activities within the firm as well as close co-ordination with suppliers and channels in the value system. This can also be enhanced by applying new information technology. More sustainable competitiveness is achieved thorough the ability to provide superior value to the market in terms of product quality, special features or after-sales service that allow a firm to command a premium price. If costs are comparable to those of competitors it can lead to superior profitability. Differentiation results from the way products, associated services and other activity affects demand market activities. Any contact between a firm and the market provides a potential source of differentiation.

The range of intermediate inputs and services that can be utilised and the variety of products that can be produced constitutes the competitive scope of firms. These economies of scope also include the types of markets to be served, distribution channels available, the area in which to sell (geographic and virtual), and the array of related industries in which to compete. Competitive scope is important

because industries often comprise different segments of the market, industrial area or network that require different strategies (Porter, 1990 & 1998a).

Competitive scope determines the nature of firm activities. It shapes the way firms perform and how the value chain is configured. On a narrow segment, a firm can with the aid of new technology tailor each activity precisely to the segment's needs and potentially achieve lower cost of differentiation compared to a broader scope. That is why the modern move is towards flexible production that was studied in chapter 4 (section 4.4.1). A broader scope can also lead to comparative advantage if a firm can share activities across segments or even when competing in related industries (Van Pletsen, 1992:21).

2.4.3 Porter's Approach to Competitiveness

The *World Competitiveness Report* of the IMD measures the competitiveness of a country by considering the country's economic strength, its degree of internationalisation, quality of government, financial and macroeconomic stability, infrastructure, management capabilities, science and technology, and the quality of its human skills (These indices will be discussed further in more detail in chapter 8). The World Economic forum determines competitiveness more or less the same by considering a country's openness, government, finance, infrastructure, labour, institutions and its microeconomic business environment. Openness refers to the degree that government policies allow a country to trade internationally. Looking at government they consider the size of government, the budget deficit and its tax policy. Firms' access to financing, the maturity of the banking sector, and corporate attitude to taxation are considered in the finance category. In the infrastructure category the extent and quality of roads, railways, ports and aviation are considered as well as information and computer technology and the quality of utilities. Human capital is evaluated by the educational attainment, health status and workplace regulations. A country's institutional framework refers to society's broad rules of the game, in particular the efficiency of civil servants, the quality of legal institutions, the rule of law and the enforceability of contracts. IMD and WEF measures the microeconomic business environment by considering microeconomic competitiveness based on the Porter's Diamond.

Porter's approach measures competitiveness by considering four determinants of competitiveness as the four corners of a *schematic diamond diagram* (Porter, 1998a:72). These determinants are factor input conditions, demand conditions, firms strategy, structure, and rivalry; and the fourth are related and supporting industries and institutions. *Factor conditions* consider the quality and specialisation of underlying inputs that firms draw on in competition. The input factors considered include natural, human and capital resources, as well as information, scientific, technological, administrative, and physical infrastructure (Porter, 1999:31).

The factors of production most important to competitive advantage in most industries are not inherited but are created within a country. Firms gain competitive advantage in a country if they possess low-cost or uniquely high-quality factors of the particular types that are significant to competition in a particular industry. Most advanced industrialised countries have comparable factor endowments in terms of infrastructure and many have similar pools of highly skilled workers. At the same time globalisation has made local availability of various factors less essential. It is not the mere access to factors, but the ability to deploy them efficiently that is most important in obtaining competitive advantage (Porter, 1990). That is why innovation and the efficient application and management of modern technology are so important. Most of the essential production factors must be developed over time through investment and the extent and difficulty of the required investment varies significantly. The basic production factors like natural resources remain important in extractive and agricultural based industries, and in those where technological and skill requirements are modest and technology is widely available (Van Pletsen, 1992:24).

The classic contribution toward understanding the economics of regional integration had been made by Viner (1950). He coined the terms *"trade creation"* and *"trade diversion"* to determine the instances where it could be beneficial for a country to engage in regional integration. Baldwin and Venables (1995) gave a good overview of the subsequent literature on the understanding of trade creation and diversion (Naudé, 2001a:53). Venables also incorporated the role of agglomeration forces into the theory, leading to a better understanding of regional integration. The success and advantages of integrated blocs can be illustrated by considering South Africa's trade with the European Union (EU). More than half of South Africa's FDI originates in the EU and the recent free trade agreements between South Africa and the EU could raise the level of FDI in South Africa even further (Dippenaar, 2001:66).

The advantages of regional co-operation are dependent on all members striving for the same monetary and fiscal policies in broad terms. All members should lower tariffs and other constraints in the same way. All members should have the same tariff policy with regard to "the rest of the world". It is therefore necessary that members should not be too dependent on trade outside the block. There should be a lot of trade among members and gradually this should be increased as a result of the integration and there should thus also be a political will to co-operate. Regional integration among less-developed countries does not succeed easily because seventy-five per cent of the less-developed country exports are to rich countries, and their imports are even higher (Naudé & Kleynhans, 2002:161). Their exports are often the same, and deficient administration and poor organisation are characteristic of less-developed countries. There are few places in the world where regional co-

operation has been a success. It has mostly only served political ends. Yet, it does provide greater political and economic bargaining power and the Southern African Development Community (SADC) is progressing in that direction. Flint (1995:3) does, however, indicate that total region integration like that of the European Union is still unreachable as the economies of Africa still differ too much in many aspects, like growth rates, inflation and exchange regimes. The formation of the World Trade Organisation (WTO) can be seen as a multilateral trade agreement, which can restrict the formation of regional blocks as all trade restrictions are supposed to disappear. WTO does however set negotiated rules on the permissibility of trade barriers and when it may be utilised.

The importance of advanced factors is becoming increasingly significant for competitive advantage. They are integral to the design and development of products and processes as well as to its capacity to innovate. These factors include highly educated personnel such as graduate engineers and computer scientists, university research institutes in sophisticated disciplines and modern digital data communications infrastructure. These are necessary to achieve higher-order advantages such as differentiated products and proprietary production technology that assists in achieving increasing returns. They are scarce because their development requires large and often sustainable investment in both human and physical capital.

Specialised factors involve specialised skilled personnel, infrastructure with specific properties, knowledge bases in particular fields and other factors with relevance to a limited range or a single industry. Unlike generalised factors like highway systems, specialised factors provide more decisive and sustainable bases for competitive advantage and are often integral to a process of continuing innovation (Porter, 1990).

The most important *demand conditions* are the sophistication of local demand and the pressure from local buyers to upgrade (Porter, 1999:31). When local markets pressure firms to innovate faster and be more sophisticated in comparison to foreign rivals, this can lead to competitive advantages in a country. The significance of local demand is not rendered less by the globalisation of competition since the local market usually has a disproportionate impact on a firm's ability to perceive and interpret market needs. With modern infrastructure and computer technology the importance of foreign markets are rapidly increasing though.

The domestic market plays an important role in fostering growth and competitiveness of a country's industry. The rationale behind this is that firms are most sensitive to the needs of their closest customers. The larger the local market, the easier it is for a firm to achieve economies of scale. Along with the size of the local market the sophistication and tastes of consumers also play an important role.

Porter argues that the more sophisticated the consumers of a product, the higher the pressure will be on the firm to innovate and produce higher quality products which in turn leads to competitive advantage.

Local firms often enjoy some local advantages in serving their home markets compared to foreign firms, even when local nationals staff foreign firms. This is due to proximity as well as language, regulation and cultural affinities. Home demand is easier to predict and preferred access to a large local consumer base can spur investment by local firms (Porter, 1990 & also see chapter 4 section 4.6.9 & Fujita, Krugman & Venables, 2001:259).

The presence of *supplier industries or related industries*, the supply of raw materials, intermediate inputs and services that are internationally competitive are broad determinants of national advantage in an industry. For example, Swedish strength in fabricated steel products, like ball bearings and cutting tools, has drawn on the strength in speciality steel as a supporting industry, while the Swiss success in pharmaceuticals was closely connected to their previous international success in the dye industry as a related industry.

The presence of internationally successful supplier industries can create advantages in downstream industries in several ways. It can provide efficient, early, rapid and sometimes preferential access to the most cost-efficient inputs. How efficient inputs are utilised is, however, much more important than availability because components, machinery and other inputs are often available on global markets. Suppliers provide advantages in terms of co-ordination. It provides linkages between value chains of suppliers and firms within the value system, which is facilitated by the proximity of essential activities and senior management (Porter, 1990).

The most important advantage of locally based suppliers lies in the process of innovation and upgrading (Sunley, 2003:194). Competitive advantage emerges from close working relations between world-class suppliers and the industry. Suppliers assist firms to perceive new methods and opportunities to apply new technology. Firms gain fast access to information, to new ideas and insight and to supplier innovations. They have the opportunity to influence suppliers' technical efforts and also serve as a test site for development work. Exchange in research and development and joint problem solving lead to faster and more efficient solutions. Having competitive local suppliers is preferable to relying on well-qualified foreign suppliers. Proximity of managerial and technical personnel, along with cultural similarities, tends to facilitate free and open information flows. Firms receive maximum benefit when their suppliers are global competitors. Locally based suppliers with international positions are also more valuable sources of information and insight.

It is not necessary for a country to possess national advantage in most supplier industries in order to gain competitive advantage in an industry. Comparative advantage can be sufficient to gain competitiveness. With the development of information technology supplies can easily be sourced from abroad where competitive advantage does not exist. The same applies to inputs that do not have a significant effect on innovation or on the performance of an industry's products.

Related industries can assist in attaining competitive advantages. These include industries in which firms can co-ordinate or share activities in the value chain when competing. It is shown in chapter 4 that the sharing of complimentary activities in the value chain is increasingly being applied in the new economy where flexible production is becoming the standard mode of production and management. Sharing of activities can occur in technology development, manufacturing, distribution, marketing and services. Related industries in a country that are internationally successful provide opportunities of information flows and technical interchange. Local companies in related industries often share activities and sometimes forge formal alliances. Especially with regard to services this can also now be accomplished through computer-based networks, even when firms are located far apart (Sunley, 2003:193). International success in one industry can also lead to demand for complimentary products and services.

The fourth broad determinant of national competitive advantage on the Porter diamond covers the context in which firms are created, organised and managed as well as the nature of local competition. Under *firm strategy and rivalry* is understood the context shaping corporate investment, the types of strategies employed and the intensity of local rivalry. Strategic policy issues considered when improving competitiveness include foreign direct investment, industrial clusters, regional integration, export targets, infrastructure and spatial planning, and sectoral strategies like agro-processing, information and computer technology, tourism, SMMEs, finance and insurance (Porter, 1999:31 & Sunley, 2003:192).

Advantages result from an appropriate match between chosen goals, strategies, and the organisation of firms in a country and the sources of competitive advantage in a particular industry. No managerial system is universally appropriate. The patterns of competition play a profound role in the process of innovation and the ultimate prospects for international success. Countries will tend to succeed in industries where the management practices and modes of organisation are favoured by the national environment and well suited to the particular industry's sources of competitive advantage. In Germany for example, the engineering and technical background of executives leads to great success in industries with a high technical and engineering content (Van Pletsen, 1992:31).

Porter (1990:117) states that *"among the strongest empirical findings from research is the association between vigorous domestic rivalry and the creation and persistence of competitive advantage in an industry"*. Competition puts pressure on firms to improve and innovate. Competition leads to lower costs, improve quality and service and create new products and processes. Vigorous competition pressures firms to sell abroad in order to grow particularly when economies of scale are possible.

Porter states that strong domestic rivalry is a national asset whose value is hard to overstate. The presence of domestic rivalry abolishes advantages that exist from simply being in a region. This forces firms to seek higher order and ultimately more suitable sources of competitive advantage. A completely open local market along with global strategies can substitute for the lack of local rivals.

The formation of new businesses is also vital to the upgrading of competitive advantage, because it feeds the process of innovation in an industry. This process is influenced by factors such as the availability of skilled and trained personnel, favourable demand conditions, and the motivation of individuals as well as access to risk capital, especially in industries where capital requirements cannot be met with individual savings and internationally generated funds.

Securing market access in a global or regional production and supply strategy and to remain ahead of competition are the most important industry specific and host specific determinants of direct foreign investment (FDI) to enhance competitiveness. For production it is important to secure access to raw materials at a reasonable price and lowering production cost per unit, but also to gain access to the best technology and skills. Political and socio-economic stability, favourable foreign investment policies, adequate physical infrastructure and transportation services are always important when trying to attract foreign investment. In chapter 4 the importance of a good supply of trainable labour and an adequate skill base, as well as a good supplier network and support services, little administrative delays and streamlined procedures was pointed out. Potential foreign investors consider the openness and market size of the host country, the investment behaviour of local firms, degree of local competition, and exchange rate and balance of payment credibility as well as good governance as important. Government actions should be predictable and consisted. Law and order must prevail, property rights should be respected and contracts must be enforced. Other factors that determine investment and location of industries are studied in chapter 4.

All these individual determinants of national advantage mentioned above combine into a dynamic system. The state of determinants usually influence others. The determinants of competitive advantage reinforce each other over time fostering a competitive platform. The determinants in this system cause the competitive industries of a country to link together in industrial clusters and not spread evenly

throughout the economy. The advantages of clusters and agglomeration are studied in chapter 4 (section 4.4.1 for example). At the meso or cluster level the agglomerations of economic activity in the local economy can be applied in an effort to remedy market failures, asymmetric information, managerial myopia, the under-provision of public goods and co-ordination failure. Clusters can develop into self-sustaining areas with resources, skills and capabilities that are beyond the scope of individual firms. Cluster development also fosters business networking and inter-firm collaboration.

In resource-driven industries and in standardised, lower-technology segments of more advanced industries, advantages in the entire Porter diamond are not always necessary for competitive advantage. Technology can be obtained through licences or by the purchasing of foreign machinery. Sufficient and local demand may be unnecessary because models and features are well established and easy to copy. Lower costs are therefore the most important competitive strategy since differentiation is not so important in a standardised market. As technology ages, the costs involved in its reproduction decreases and local economies can build and innovate on that.

The new economy with its more sophisticated industries requires advantages in several determinants as competitive advantage depends fundamentally on the rate of improvement and innovation (Sunley, 2003:194). Firms that lack a sophisticated local demand, capable suppliers, technology, or other favourable determinants, face difficulties in innovating faster than their rivals that do.

As the world is shifting from the industrial age to an information age, the widespread use of modern information, computer, communication and other technology is changing the new economy. National boundaries are becoming less important. Production and management packages can be compiled utilising sources from everywhere in the world with no time loss. This enables competitive advantage to be obtained in industrial networks instead of in the boundaries of a country (Sunley, 2003:193).

2.5 PRACTICE OF INDUSTRIAL POLICY

This section considers the practical implementation of industrial policy in a country. Efficient implementation of industrial development policies and strategies are dependent on the macroeconomic setting in which such policies have to function. Section 2.5.1 therefore considers aspects related to the macroeconomic context, which include the fiscal, monetary, financial, and exchange rate policies of the authorities. Sections 2.5.2 to 2.5.4 then considers elements of industrial development strategies that are usually included as part of industrial policies. Active interventions are discussed and emphasis is placed on selective interventions and functional policies. Industrial development in LDCs, like South Africa,

should focus on the acquisition of technological capacity, education and training, and the improvement of managerial practices and this is therefore discussed in the final section of 2.5.5.

2.5.1 Macro-Economic Policy and Industrial Policy

A stable macro-economic environment is one of the most important factors for industrial development. Industrial development policy does not function in isolation. In section 2.3 the theory of industrial policy, with reference to international trade and the role of industrial policy in the theory of production as a way of enhancing competitiveness, were discussed. All these aspects stand within the macro-economic landscape and will be influenced by the macro-economic policies of the country.

In section 2.5.1.1 consideration will first be given to monetary and financial policy, followed by section 2.5.1.2 that will consider the need of a moderate exchange rate and the possible value of deprecations for industrial development. Then sections 2.5.1.3 to 2.5.1.7 will consider inflation, price policy, interest rates and monetary policy, foreign investment, multinational corporations, and privatisation.

2.5.1.1 Monetary and Financial Policy

The advantages of market related exchange rates and interest rates for industrial development should be obvious after the advantage of free trade was considered above. High interest rates would increase investments as it increases savings and the funds available for higher investment. Unfortunately savings do not correlate well with interest rates in Africa. Foreign investments can also increase with higher interest rates but the interest rate elasticity of investment is very low in Africa and South Africa (Fourie, 2001:54). Real interest rates that reflect the equilibrium level between the demand and supply of funds will ensure that only investments that are able to cover high interest costs would be undertaken and thus increase productive and efficient investments. When interest rates are below equilibrium interest rates, it does not represent the true scarcity of money and capital. This could lead to suboptimal allocations of money and capital and a waste of resources. This is often the case in LDCs and care should be taken to increase interest rates towards equilibrium levels (Todaro & Smith, 2003:237).

Interest rates at equilibrium levels or even higher could bring the formal and informal sectors closer and encourage intermediation through financial institutions. Intermediation can lead to economies of scale, reduce costs, decrease risk, allow higher rates for depositors and also lead to more efficient investments. Policy makers should, however, guard against the contractionary impact on the economy of too high interest rates. Savings can also be encouraged through several schemes and the building of banks in rural areas, for example.

Well-managed monetary policy would assist the market mechanism in the funds market to become and function as free as possible. It would allow the money supply to grow slowly, preferably at the same pace as national production output, and it would avoid direct regulations and credit ceilings and promote flexibility. The availability of credit, especially to those with very little collateral is essential for industrial development. This should be accompanied by insurance schemes that will provide a safety net for borrowers that default, as this would make financial institutions more willing to lend out funds to private firms, especially small firms which traditionally create the most employment opportunities. Such insurance schemes require innovative mechanisms to avoid the problems of moral hazards, which are usually associated with these schemes. In African countries most often only the largest companies and state corporations obtain loans for investments from the financial intermediaries, while the rest can only expand through the utilisation of profits and unpaid dividends (Collins, 1997:45-51).

Too rapid or incomplete liberalisation of interest rates could choke off investment recovery without creating substantial growth in financial intermediation (Todaro & Smith, 2003:747). Removal of all direct credit programmes could block potentially useful policy instruments that can be used selectively to promote certain activities. A responsibly managed monetary authority is conducive to further direct foreign investment and prevents capital flight.

Financial repression limits development and the advantages of free enterprise will only realise if financial institutions are allowed to do business in a profitable and free manner. The disadvantage of financial repression was argued by Stiglitz and Weiss (1981). The advantages of free trade were shown above, but free trade will only be possible if money markets are allowed to develop with the economy. Too strict control of capital markets and shortages of currencies and funds to borrow only leads to stagnation and disintermediation. Informal parallel markets already exist in LDCs due to regulations and conditions that are to strict or too expensive leading to various illegal activities.

Adequate supervision of financial intermediateries are however very important. Institutions that do not conduct responsible management could lead to problems in the monetary sector and banking failure (Baumol & Blinder, 2000:244). In Southeast Asia the economic crisis of 1998 was largely due to irresponsible financial management by the banking system (Mankiw, 2001:406). Long-term loans were given, financed through funds obtained in the short-term markets and when too many depositors wished to withdraw their funds, those countries had a crisis. Financial liberalisation is thus very important for industrial development, while the authorities still have the reasonability to ensure that sound economic principles are adhered to (Arestis & Demetiades, 1997:790).

Interest rates should not, however, be so high above equilibrium that it crowds out private investment. However, most often interest rates are set too low by the authorities leading to a distortion of the price mechanism, the application of inappropriate capital-intensive technology and increasing unemployment, together with very high inflation rates (Mankiw, 2001:283 & Todaro & Smith: 2003:237). Interest rates those are too high also present possibilities of moral hazards to occur (Fry, 1997:757).

Co-ordination of policies set by the authorities are important. Criticism is often expressed against the fiscal and monetary authorities that do not work together in achieving economic objectives. Government could for instance have an expansionary fiscal policy in an effort to create jobs, while the monetary sector increases interest rates to reach its exchange rate or inflation targets, but simultaneously these overvalued interest rates could curb private investment that could create jobs, following overvalued demand created by the government expenditure. The following section discusses exchange rate policy.

2.5.1.2 Exchange Rate Policy

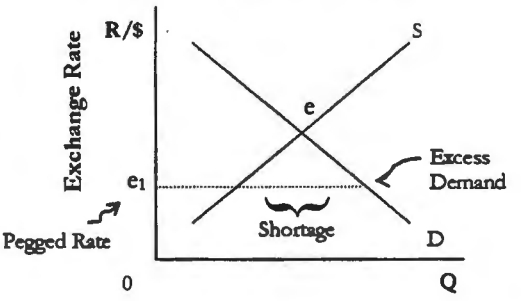
A well-managed exchange rate ensures an exchange rate that is correctly valued and stable to assist industrial development and economic stability in general. Kim (1991:84) had however found that exchange rate changes could not explain the growth in manufacturing exports in Korea while Balassa (1990) found the same in Sub-Sahara Africa's agriculture. It is however, an important factor that should be considered when developing an industrial development policy.

It is important to have an exchange rate that is not overvalued or undervalued (Gillis, Perkins, Roemer & Snodgrass, 1996:515). When the price of coffee, copper or gold increases it could provide foreign currency and lead to an appreciation of the local currency. This strengthening of the local currency is a bonus for local importers, but decreases the competitively of local firms, as their exports are becoming too expensive, causing a decline in production, economic growth, a deficit on the balance of payments and job losses (Krugman & Obstfeld, 2000:471). When the exchange rate depreciates it will create more employment as the competitiveness of local firms improves and exports would increase, creating jobs and income. A depreciation leads to larger exports but it causes import strangulation as imported goods becomes too expensive.

Trade liberalisation usually depreciates the real exchange rate, while lower tariffs could lead to a decrease in the price of imports relative to exports. This will have a substitution and income effect causing a depreciation. Excess demand for foreign exchange in a fixed or pegged system often spills

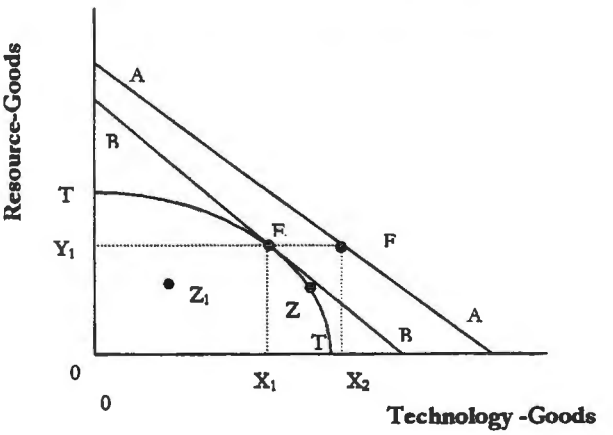
over into illegal parallel markets, making monetary and exchange rate policies ineffective. Parallel markets usually employ exploitive premiums as it causes currency shortages or surpluses. This is illustrated in figure 2.27, which simply shows the demand and supply of exchange. As the exchange rate is pegged below the equilibrium rate, an excess demand develops as demand exceeds supply. This will force people and businesses to seek accommodation outside the legal system leading to a double exchange rate, where the one is illegal and uncontrollable, providing exploitive rates and easy channels for flight capital and other illegal activities and speculation. A floating system decreases the existence of parallel markets. Monetary systems in LDCs are still poorly developed and still often require discretionary pegs, dirty or managed floats with large of interventions by central banks (Weiss, 1995:64).

Figure 2.27 A Pegged Exchange Rate



Floating exchange rates, whether clean or dirty floats, can be managed through an interbank market arrangement where authorised dealers trade currencies on behalf of their clients. An option for LDCs is however to let the central bank control foreign exchange auctions, especially where a competitive network of commercial banks or foreign exchange dealers has not yet been developed. This is, for example, applicable where a large share of foreign exchange earnings comes under the direct control of the government, through commodity exports or mineral royalties. The so-called Dutch action where the government can price discriminate between buyers of foreign exchange and each successful bidder only pays the price they bid, is the most appropriate for LDC because over-depreciation can easily occur as purchasers overbid in the following auctions if only a market clearing marginal rate is charged (Weiss, 1995:64). The authorities can influence rates at an auction by controlling the amount of foreign exchange available or by imposing limits or costs on potential bidders, restricting their demand for foreign exchange. In an interbank system, intervention by the central bank is possible through direct open market transactions to influence rates,

Figure 2.28 Adjustment with Devaluation



rather than simply setting its targets for foreign exchange reserves. Exchange rate floats are normally associated with substantial liberalisation of current account transactions, which can also aim at assisting industrial development programmes. In many cases in LDCs however, capital account controls have remained in force to prevent capital flight, where holders of local assets convert these into foreign exchange and take them abroad. Strict control over capital account flows do, however, retard investments, especially from abroad as it will limit investors' ability to repatriate their profits and this will be detrimental to the country's industrial development policies. Quirk and Cortes-Douglas (1993:2) made an assessment of the floating arrangements associated with IMF programmes and found that Uganda and Guinea initially selected an auction form of floating because there were not enough dealers needed for a competitive interbank system. Roberts (1989) found, however, that auctions in Africa were often manipulated during the 1980s, especially in Nigeria, Uganda, Guinea and Zambia

If production is at point E in figure 2.28 but the international price ratio AA , there will be internal equilibrium at point E but an excess demand for technology-goods of X_1X_2 , implying an external disequilibria and a balance of payment deficit. This problem can be addressed by a combination of expenditure reduction in fiscal policy and relative price changes via devaluation in the exchange rate (Weiss, 1995:49). Devaluation could move production to point Z leading to an internal and external equilibrium but would reduce total expenditure. Relative price adjustments might be required to decrease expenditure to reach equilibrium if the devaluation is not adequate.

An expenditure-reducing step alone might also achieve external equilibrium but at a cost of internal equilibrium. This would cause a decline in output and employment (especially in resource-based goods in which the LDC specialises). Such a step would move the price line AA parallel towards the origin, say to point Z_1.

The static effect of devaluation might be to decrease production, income and employment but the dynamic effect would be to decrease imports and raise exports, which in turn would raise expenditure, production, income and employment to a higher level in the longer-term. This new level would also be more sustainable as it would lead to the optimal allocation of resources.

When the economy was at point F in figure 2.28 and moves to Z to restore internal and external equilibrium, there is a distribution effect that leads to a decrease in the production of resource-based goods and an increase in technology-goods. Owners of capital and producers of technology-goods are then favoured at the cost of the resource-based sectors. As production increases in technology-goods the production factors used most intensively in its production are favoured and income redistribution takes place towards them, especially towards capital. When the relative price of traded technology-

goods rises moving to point Z , income redistribution will occur that depends on whether the technology-based sector (T) are capital (K) or labour (L) intensive relative to resource-goods (R), and production of technology-goods is more capital intensive ($L_R/K_R > L_T/K_T$). The more price elastic demand and supply are the smaller changes in good and factor prices have to be to achieve changes in resource allocation, and the smaller the change in the real exchange rate has to be to manipulate income distribution.

A change in the exchange rate would influence the whole economy, and as a LDC is a price take it might rather choose to change the relative prices of its non-tradables. Fiscal, monetary or direct measures influencing inflation might then be preferred above exchange rate adjustments. Small economies do not always have so much control over the exchange rate and deprecations often occur by itself. LDCs also often prefer to peg its exchange rate to a reference currency like the USA dollar or a composite of currencies (Weiss, 1995:62). Devarjan and De Milo (1987) found evidence that several of these countries experienced low inflation rates probably due to the effect of this nominal anchor. Edwards and Edwards (1987 & 1993), among others, also found that countries with fixed exchange rates often have lower inflation rates. Weiss (1995:54) notes, however, that the exchange rate is often not the most appropriate instrument to achieve inflation objectives. Inflation is important for industrial development and would be considered in the following passage.

2.5.1.3 Inflation

Inflation has an impact on the cost structures and sales prices of firms with a direct influence on their profitability and competitivety. Rising local prices make local markets uncompetitive even when firms function most efficient. When inflation causes local prices to be too high, foreigners rather buy their goods and services from firms in other countries where prices are lower. It is therefore important that the local authorities would aim at low inflation rates and also low inflationary expectations. Prices can be pushed up by higher import costs or expectation, but in LDCs inflation is mostly caused by demand-pull due to increasing government expenditure and financing the budget deficit through loans from the central bank, which increases the countries money supply. It also leads to lower growth and has a negative distributional effect (Mankiw, 2001:351).

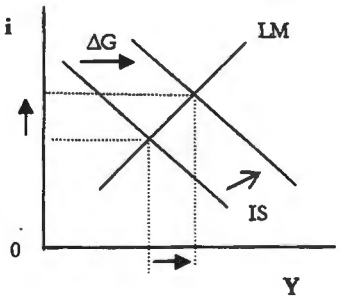
Governments can set inflation targets or margins and work towards reaching those targets. The authorities can also set targets or margins for the growth in the country's money supply, which effect would be about the same. Often the policy steps involved could however, be detrimental to industrial development. The standard treatment for inflation is increasing interest rates to curb credit creation and the money creation activities of banks. Higher interest rates have a crowding-out effect and deprive firms of the essential credit funds that they need. However, too high inflation rates would

harm them even more as they will become uncompetitive in global markets and forced to stop their activities or at least cut it down to local demand, if local markets do not have access to cheaper international commodities.

2.5.1.4 Fiscal Policy

Responsible, transparent, honest governance is important. When the returns of additional governmental expenditure are larger than the cost of financing, government expenditure could be rational. It would be better for governments to borrow from overseas though it leads to foreign claims on the country. Foreign loans are not difficult to secure and could lead to a debt trap as annual loans accumulate and it may provoke capital flight. Borrowing from the non-banking private sector is probably the best option to finance excess government expenditure, when taxes are not enough as it do not increase the money supply. Figure 2.29 shows, however, that such a step would increase interest rates. The LM curve represents all the different levels of income (Y) and interest rates (i) where the demand and supply of money are in equilibrium, while the IS curve represents equilibrium in the real sector. These higher interest rates would make the borrowing of funds too expensive and private sector investment would decline. The effect is then that government expenditure funded in this way would crowd out private sector activity. Higher demand on the market would also increase prices indirectly even though government causes it (Colander & Gamber, 2002:315).

Figure 2.29 Crowding Out



Before deciding on government expansion and methods to finance it, all costs and benefits to society must be taken into consideration including all the externalities. If it is positive and yields profits, financing of government expenditure might in effect be cost free and there will also be dynamic effects on income and employment creation through the multiplier. But LDCs has supply-side constrains like a shortage of skilled labour and foreign exchange (Todaro & Smith, 2003:380 & 68).

Crowding-in can occur when public investment induces private investment to increase, sometimes also called inward industrialisation (Botha, 1992:6). This can happen when the provision of infrastructure for example, reduces costs or raises the revenue of private sector projects. It can raise income leading to higher savings, which can in turn again lead to higher investment. Although empirical evidence on the complimentarity between public and private investment is rather ambiguous (Weiss, 1995:30) the relation mostly holds for infrastructure investment. Some evidence exists that poverty- focused

investment, like labour-intensive public works or primary education, have rates of return well above the opportunity cost of capital (World Bank, 1990). This implies that investment portfolios should also include this to ensure higher long-term growth.

Lower government expenditure, unfavourable deficits and credit creation can curb inflation but the lower output can cause losses on income and production that is too big. Inflation should thus not be fought at all cost. The authorities should always keep the influence of expectations in mind. In South Africa and other LDCs the threat of political problems due to popular demands by some groups can always increase risk perceptions of investors. Inflation can also be curb through moderate wage demands by trade unions. If their demands for wage increases are low it would not contribute that much to production price inflation although it might not be fare to the workers. Wage control could also possibly lead to civil unrest especially if the work force is not well recognised in the process (Menezes-Filho, 1997:652). The following section considers the possible role and effect of price control as a means of fighting inflation.

2.5.1.5 Price Control

Price control could in theory be considered as a direct measure to address cost pressures and advance industrial development. The marginal cost pricing rule (MCPR) states that when prices are set equal to the marginal cost of production in a perfect competitive market, it will maximise the sum of consumer and producer surpluses and achieve optimal resource allocation (Ghatak, 1995:103). Markets where prices are set equal to marginal costs are regarded as the "first-best" condition. In LDCs conditions depart from perfect competitive markets and government interventions have to address market distortions and failures beyond allocative efficiency. When the cost of additional consumption is, for example, above its social value it provides a rational for taxation. Most people in LDCs are, however, very poor and it might decrease people's welfare. When prices depart from the point where it is equal to marginal costs it sets a case for government intervention, through subsidies, taxation, or setting prices.

When the cost of a unit of consumption at a critical level of consumption is equal or below its social value, there might be a rational to depart from the MCPR (Weiss, 1995:146). Prices below the social marginal cost level can be justified if there are significant:

- Distortions in the production process so that the shadow price (which are equal to the free market price) are below the existing market price
- Subsidies on competing goods; or
- Use of goods by low-income consumers and pricing policy can assist the poor as a distributional tool.

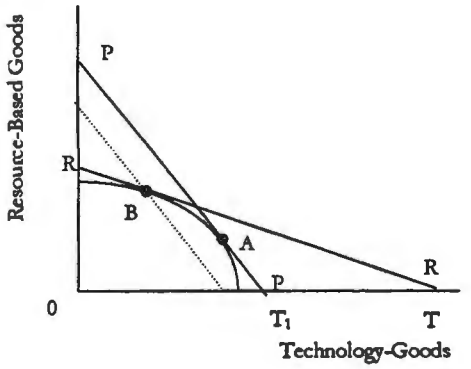
Prices above marginal costs can also be justified if there are significant:

- Subsidies on production inputs
- Taxes on competing goods
- Where they are sold under monopolistic conditions; or
- When demand is price inelastic and price policy is used as a form of taxation.

Other objectives might also exist, like to shift surpluses from rural to industrial sectors (Ghatak, 1995:274). The appropriate price will depend on the relative importance of the factors mentioned above. The aim of price policy is to move local prices closer to relative marginal social values where distortions and objectives are included in social values. This should then lead to a more efficient point of production as well as consumption.

Figure 2.30 Effect of Price Control

The effect of price policy is shown in figure 2.30 where PP represents the initial distorted local price ratio and RR the set of social values. Production will be superior if it moves from point A to B. Production at point B would be worth OT in terms of technology-based goods, while it was only worth OT_1 at A (Weiss, 1995:147).



Under the modern trend of liberalisation, all price control should be removed. It should only be applied to a few key staple consumer goods for the very poor, if at all. Even then it should not be applied generally but only discriminatory, although a subsidy to the poor might be a better policy. As was shown in figure 2.27, when prices are too low, shortages develop. Internationally traded goods should be traded at international prices and local cost structures should adjust to international prices. Open international competition leads to better resource allocation and higher wealth for all. This liberal concept posits that perfect competitive markets and free international trade would lead to perfect competitive markets with no market distortions and failures in the shortest time. This implies that it is assumed that distortions in the market or the production of goods are either unimportant or self-cancelling. The principle is that intervention on distributional grounds should be transparent and as direct as possible. This implies that pricing policy might not be the most efficient policy (Finkelshtain & Kislev, 1997:83; & Mansfield, 2000:304).

Price control pressing prices below their natural supply and demand level leads to excess demand in local markets, causing inefficient use of consumer goods. Such control on final goods restricts production. When these producers are state owned enterprises it would raise the budget deficit leading

to expansionary monetary policy and inflation, decreasing the purchasing power of the poor the state wishes to help (Mankiw, 2001:128 & Vivian, 1996:401).

Pricing policy is often imposed to lower inflation, especially on goods that are basic inputs like cement or fuel; or as part of an income distributive policy, like on important consumer items like sugar or salt. The danger of leakage to the non-poor always exists. Here price control would only be efficient if combined with appropriate expenditure policy and even then it cannot be applied indefinitely. Price control can also be utilised as part of an anti-monopoly policy. In LDCs the industrial sector often has much higher levels of concentration than in the developed countries (Gillis, Perkins, Roemer & Snodgrass, 1996:100, & Parente & Prescott, 1999:1216).

When goods that can not be exported due to too high transport costs, poor infrastructure or poor quality receive subsidies and/or enjoy protection from imports due to price control, it would be able to undercut imports. It would be able to produce and provide employment. When price control, tariffs or subsidies are required to keep an inefficient industry in business, it costs many resources and imposes a cost on local consumers with inefficient production and sub-optimal resource allocation. An infant industry might initially be assisted in this way. Without tariffs or at least subsidies this local production and employment would have been lost. Government intervention is thus important. But it is unfair to expect consumers to pay in order to keep inefficient firms alive. These resources would be utilised better in an industry where the country has a comparative advantage and can compete internationally. Any price policy operates as second-best policy options and it is usually not improving welfare.

Dualism is characteristic of LDCs in that there usually is a more developed section while the rest of the community is poorly developed. This dualism in LDCs provides the possibility to help the poor and improve company profits through price discrimination. Due to differences in demand elasticities, the better off residential areas or cities could, for example, pay higher prices cross-subsidising poorer settlements. It could also facilitate the existence of an industry or firm if the average cost were much higher than demand. This could lead to positive consumer surpluses and enhance welfare levels in areas where no output would have been possible (Mansfield, 2000:349 & 353).

LDCs lack the necessary funds for investment as the marginal propensity is too low and when funds could be available, even in the informal market, investors are often absent or too risk evasive. Local investors also usually do not have the financial backing that would really make a difference in industrial development of a country. This emphasises the importance of direct investments coming from abroad. The following section considers foreign investment and the role of multinational corporations.

2.5.1.6 Foreign Investment and Multinational Corporations

In LDCs local savings are not enough to supply in the demand for investment funds and the economic development needs. Funds coming from abroad is therefore of the utmost importance and industrial policies should promote foreign investment in their economies. When firms in one country buy or build plants and facilities in another country, the capital movement can be seen as direct investment (FDI). Larger firms can invest in foreign countries because they have the funds and superior technology, they can reach scale economies, and produce better quality well-known product lines, which yield competitive advantages over local firms. Multinational corporations (MNC - also known as trans-nationals) can raise production efficiency and flexibility. They do, however, often have the ability to exploit the host country and manipulate prices, taxes and foreign exchange (Meier, 1989:254).

Foreign direct investment (FDI) is an important and often the only channel for LDC economies to obtain advanced technology. FDI generally speeds up the process of technological upgrading because it raises the rate of capital accumulation and access to additional advanced technology. In reality it is unfortunately only a limited number of countries that are able to support the process of upgrading through foreign real and human capital investments. Technologically backward countries are not only characterised by high returns on investments in relation to the developed world, but it also have a high default risk because of unstable technological and social environments. The premium necessary to compensate for such a risk tends to counterbalance the return differentials and often even exceeds it (Naudé, 2001a:29). The high returns from LDCs increases their chances to attract FDI and additional capital for technological upgrading, which can speed up the process of catching up.

MNCs can evade tariffs by building a plant within another country. The same can happens where tax havens exist. This explains why many foreign firms concentrate on large markets, scarce resources, or an abundance of cheap unskilled labour. High transport and transaction costs can also be a factor. Foreign companies are usually also more successful than local firms because they have more and better capital at their disposal.

The transfer of capital eliminates the difference between the marginal products of production factors between countries. As the marginal products in the various countries drop, the real rate of return on capital decreases and removes the incentive to transfer more capital. This leads towards equity. Capital transfers increase output and efficiency of the world economy, as the receiver country's gain is larger than the other's loss implying a global gain (Kenen, 2000:151). Capital transfers redistribute income from labour to capital in the country of origin, leading to declining wages rate. In the receiver country though, it redistributes income from capital to labour, increasing their wages. Workers in capital-poor countries should therefore favour capital transfers although it would decrease income of capital owners

in that country. Owners of capital will, however, loose less than the workers will gain and a tax on wages could then also be used to compensate losses of capital owners, therefore everyone wins. When capital transfers are large enough to equalise marginal products of countries, it would also equalise the marginal products of labour and land and through that maximise the efficiency of the global economy. Capital transfers do not undermine the basis of trade because countries' endowments of land and labour will always differ (Kenen, 2000:173).

Investment by MNCs in an economy can contribute to the contestability of local markets and are often better equipped to overcome some cost related barriers that limit entry to the markets (Dippenaar, 2001:64). "*... governments are increasingly viewing multinational enterprises as a means by which they can upgrade the competitiveness of their domestic resources and capabilities and evolve a pattern of development which is consistent with their long-term dynamic comparative advantage*" (Dunning quoted by Naudé, 2001a:16). MNCs have special advantages in their favour, like more advanced technology and well-known brand names. These are generated in industries with relatively high cost-barriers to entry, due to the cost of research, product development, and advertising and these are conducive to their entering in such markets while other cannot (Hirsch & Hanival , 1998:88).

MNCs also increases the efficiency and flexibility of the global economy as it makes resource allocation and trade patterns more sensitive to relative costs. When costs in one country rise, for, example, all firms will seek alternative sources of supplies. Multinational affiliates reduce the cost of securing new sources and breaking contracts. MNC can shift resources between affiliates without resistance and minimum costs. They have contacts in many countries and have better information.

MNCs usually possess great flexibility that enables them to position themselves strategically towards the market and react and reposition quickly and with ease when conditions change. The flexibility in transferring economic resources, information, knowledge and ideas internationally through global maximisation of networks, which offers an almost infinite variety of transactional operations, are the main advantages that MNCs have above local corporations. Global networks contain divisions of labour, which implies that firms are often dependent on each other and their activities have to be co-ordinated. Co-ordination is achieved through the interaction among firms in the network, in which the prise mechanism is only one of a variety of decision variables. Networks reduce risk while firms maintain a complex set of external connections with customers, suppliers and competitors. These external bonds lead to a corresponding set of internal ties that link the various sections of the firms and are necessary in performing transitions with clients. When efficiently structured, these networks adapt rapidly to changes in market conditions and customer needs, which give the participants of a network a competitive edge (Gilroy, 2001:70).

Industrial policy can also encourage MNCs to settle in a country and others to become multinational. It could promote employment and training in a LDC, but also create problems to governments concerning jurisdiction. MNC also assists countries in becoming outward-orientated and develop export markets.

MNCs locating in a country bring with them managerial expertise, access to credit, modern technology and the capacity and capability to utilise it in production and business activities. They also provide employment, enhance local living standards and improve the tax base. No company functions in isolation and local firms benefit from this as they enjoy the benefits of technological and knowledge spill-overs. Asymmetry of information is characteristic of LDCs where many firms lack the necessary intelligence to compete successfully. MNCs have large networks and capacity to obtain and process information into competitive intelligence and develop, transfer and apply new knowledge, giving them an advantage on other firms. This enables them to reach increasing returns while their competitors are still locked into diminishing returns (Gilroy, 2001:79). Factors like entrepreneurship, network and other externalities, customer lock in, large up front costs, learning and experience that lead to a never-ending improvement in capital, and producer learning based upon the economies of increasing returns have generated new company strategies in which correct timing and positioning all add to the dynamic capabilities of MNCs. Gilroy states that the "sustainable competitive advantage depends on the dynamics of an enterprise" and MNCs have this capabilities to supply these dynamics.

The Hymer-Kindleberg hypothesis (Hymer, 1976) states that MNCs have some non-marketable advantage over local firms that is sufficient to overcome the natural obstacles of operating in some distant foreign market. Gilroy (2001:76) notes that the basis of Hymer's work is found in all studies on MNCs since 1960. Hymer provided an international extension to the theory of the industrial organisation. FDI was then due to the existence of imperfect competition, product differentiation and barriers to entry. The central idea is that the MNC is a firm with an internal market of transactions that are not economically viable in spot markets. Gilroy (2001:77) states that transactional diversification through contractual and relational arrangements can provide a entrepreneurial mechanism that can capture potential integration economies, like economies of scale, scope an ray economies, associated with the simultaneous supply of inputs common to various production processes geared to distant final product markets. This provides MNCs with a competitive advantage above local firms.

When the disparity in capabilities is too large entry by MNCs could push local firms out of the market or force them to go into joint ventures or non-equity arrangements with the MNCs. In most countries, these latter mentioned arrangements would only be possible if competition laws are lenient enough to

allow it. Industrial policy should, however, guard against negative externalities that could result from mergers and inter-firm agreements. Most analysis indicates that such agreements can lead to significant welfare losses in the economy (Dippenaar, 2001:83). Local rivalry contributes directly towards global competitiveness of firms through pressures to innovate, and should be promoted through industrial policy and anti-monopoly and merger regulations.

Hirsch & Hanival (1998:82) note, however, that economic concentration is the end result of the economic process. Firms in concentrated industries do not earn higher profits because of higher prices and exploitation of their customers, but because they operate more efficient. Protection of the consumers is a dynamic consequence of competition. Research also indicated that local competition is an important factor that increases the rate at which multinational organisations can transfer technology into a host country. UNCTAD (1998) stresses the importance of FDI in trade policy in promoting global competitiveness between firms.

Various factors have an influence on the impact of FDI and MNCs in a country. Among these are the role of the MNC in the economy, which sectors would receive FDI and the type of financing and investment. Whether their approach is export-orientated or import-substituting, linkages with foreign subsidiaries in the local economy and the conditions set by the host country will all have an influence. UNCTAD (1995a:51-53) regards the most significant influence of foreign subsidiaries to be their contribution towards output growth and job creation. These points are major objectives of industrial development policy and the promotion of FDI and especially the establishment of multinational firms in the local economy should therefore receive special attention when designing industrial policy. The activities of MNCs in less developed countries are, however, usually not very well diversified. They are usually only concentrated in a few industries and sometimes only active in a single industry.

MNCs bringing advanced technology to a country would be of little value if the receiver country does not have the capabilities and adsorptive capacity to enjoy the benefits of the technological and knowledge spill-overs it can provide. Industrial policy should be geared to accept new advanced technology and knowledge and employ it to improve the country's competitive position. Gilroy (2001:81) states, *"basically it is the creation of an innovative-imitative environment which is desirable since given that firm-specific know-how is mobile, which definitely applies to the case of embodied technology, ...know-how is not only the knowledge concentrated in one location but the whole stock of intrafirm know-how worldwide"*. Such transfers are termed the *"market-hitchhiking"* effect of trade and investment by Ozawa (2000:218). MNCs provide new "created assets" such as knowledge, technology and skills, which can lead to external economies of concentration. This can assist the catching-up processes and serve as a powerful driving force behind structural change, and economic development (Naudé, 2001:81). Countries differ in their level

of industrial development and MNCs can act as a catalyst for structural evolution. Both leaders and emulators can mutually benefit from interactions with each other in terms of trade and investment opportunities and this should be managed through appropriate industrial policies and the authorities responsible (Ozawa, 2000:217).

2.5.1.7 Privatisation and Industrial Development Policy

Early development literature assumed that widespread market failures and externalities in LDCs, combined with the absence of a dynamic indigenous private sector, necessitate state involvement to generate economic progress (see e.g. ILO, 1944:185). Although there are many advantages of state owned businesses (SOE), in less developed African countries the modern trend is to move away from SOEs and towards privatisation. Advantages of SOEs are that:

- It is better were natural monopolies will form, e.g. electricity. To ensure those prices are not set to high and eliminate shortages.
- There is an absence of markets in LDCs and the privatisation of a company would create a new monopoly. Keeping it a SOE would protect consumers.
- It is a good means of capital formation in LDCs where capital is scares and savings are low.
- It can answer to needs where there are a lack of private initiative
- It can create employment and provide training
- Increase export
- It can be located in rural or other backward area to improve income distribution
- Strategic sectors like defence
- Helps ideological motives

Less developed countries are moving towards privatisation because:

- SOE is often a costly burden to the state
- It makes significant demands on government recourses
- SOEs are often not profitable, productive and efficient, very small surpluses are generated, if any
- Privatisation makes firms more flexible and production more effective
- Decentralisation of decision-making improve production and profits
- Provides better incentives for managers
- Helps to increase the price of capital (interest rates) and will in that way eliminate the bias towards capital-intensive production technology.
- Increase entrepreneurship and competition
- Minimise the abuse of power and corruption

- The neo-classical paradigm states that privatisation improves efficiency, increases output, lower costs and economic growth
- Curbs government spending and would increase taxes
- It is a way to broaden the base of ownership and participation in the economy (Todaro, 1995:453-455 & Todaro & Smith, 2003:758).

The study by Lorsch (1991) is often cited in literature concerning privatisation. The privatisation of textile mills in Bangladesh was studied and it was found that the private firms had lower costs than public firms, both in economic and financial terms. There are also various other studies analysing the advantages of privatisation, for example Dyck (1997) that investigated privatisation in East Germany, Newberry & Pollitt (1997) studied privatisation and restructuring in Britain, Brada (1996) considered privatisation in socialist countries, Lau, Qian and Roland (2000) studied China, Ndulu and O'Connell (1999) investigated Ghana and other African countries, while Milgrom (2000) studied privatisation in the USA.

In the absence of markets, care should be taken not to form new monopolies when privatising SOEs. This might be accomplished by dividing a company up in a few smaller companies, or sell many shares individually to a wide range of buyers, for example. Privatisation can also yield a wide range of positive externalities like those mentioned above. Privatisation creates a climate of business confidence for the private sector. This can lead to higher long-term investments in a country and the development of the local capital market. Privatisation can raise income to state provided funds, for example for development, education and training, health and the treatment of AIDS, and it can decrease tax pressures. Governments should, however, be careful not to regard income from selling state assets as a continues income stream as it is only a one off sale, but it would generate frequent taxes that would continue in future and grow as the company grows and become internationally competitive.

Weiss (1995:7) states however that it is *"difficult to find any evidence that public owner ship per se is a cause of inefficiency"*. It was shown above that public participation in the establishment of new industries could be of value especially where the initial set up costs are too high. Industrial policy should promote the private sector to expand and the public enterprises to become more efficient, through a market friendly environment in which competitive forces can lead to cost reductions and quality improvements (World Bank, 1991).

After studying the influence of the macro-economic environment on industrial development, the following section considers how governments build industrial competitive capacity.

2.5.2 Elements of Industrial Development Strategies

Trade and industrial development policies should compliment each other and government should take care to ensure that they are not conflicting. Trade policy aims at the promotion of development of the economy through the creation of a supporting environment for industrial trade (Hirsch & Hanival, 1998:39). As trade policy is becoming an increasingly important determinant of competitiveness of local firms, the dividing line between industrial policy and trade policy is fading. Trade development leads to the growth of industrial sectors and industrial development policies are sometimes regarded as unnecessary, but industrial development, and in particular manufacturing growth, is however, indispensable for economies to grow. Industrial policy can focus on specific aspects of development like technological enhancement of manufacturing and regional development. This section studies the ways that authorities usually follow in building a competitive platform and the components that are included in industrial development policies and strategies.

Industrial policy can be sub-divided into:

- Active interventions and incentives. These include, for example, import restrictions and tariffs.
- Functional policies: These include, for example, training and providing infrastructure and development loans.
- Selective interventions. These could include, for example, limited licensing, subsidies a specific industry or firm, or specific occupational training.

2.5.3 Active Interventions

Policies designed to develop industries traditionally took the form of direct law and regulations aiming at improving development in general. Active interventions could, for example, entail tariffs, import restrictions, quotas and non-tariff barriers, like general health standards, and packaging and labelling requirements (Grant, 2003:417). It can also include inward-investment, the stimulation of indigenous growth and regeneration of low growth through public investment in social-economic infrastructure in general (Armstrong & Taylor, 2000:213). Countries can also provide free trade areas and even take steps to arrive at the ideal situation of total free trade. In most cases active interventions do, however, intend to protect local markets and assist development of local industries.

The ideal position is to have a well-developed economy in which market forces can ensure the highest development through free markets and trade. It was shown in various sections of this chapter that free trade leads to gains in efficiency and growth. In most cases active policy interventions are suboptimal. In nearly all cases consumer surpluses decline while producer surpluses rise as a result of active policy

interventions such as tariffs, export subsidies, import quotas and export restraints (Krugman & Obstfeld, 2000:206). Deviating from free trade can, however, reduce the consequences of market failures in local economies, especially in LDCs like South Africa. According to the theory of second best, discussed in section 2.3.1, it is not optimal policy for governments to abstain from interventions if markets fail to function properly (Krugman & Obstfeld, 2000:246). A tariff could, for example, raise welfare if there is a marginal social benefit to produce or assist production of a commodity that is not captured by producer surplus measures.

The final outcome of active interventions is in most cases negative, or at least ambiguous. The effects of globalisation and economic liberalisation are also deteriorating the powers of governments, but also provide the opportunity to apply a new generation of policies that are specifically designed to create competitiveness (Painter, 2003:359). Government interventions are today restricted to market friendly improvement of factor markets, but the promotion of industries, services and especially manufacturing will not easily succeed if firms are not assisted in becoming competitive. Market failures, especially in less developed regions, forces governments to design policies that utilise strategies that are not only functional but also selective. In sections 2.2 and 2.3 it was suggested that economic theory can justify selective interventions when market failure exists, particularly if such interventions in specific activities might restore equilibrium.

2.5.4 Selective Interventions

Selective interventions can be especially appropriate when there is a specific market of industrial imperfections in the market. A less developed country could, for example, experience a shortage of civil engineers, computer operators, or accountants. Providing specific training or grants for civil engineers employed by the water board, or computer training or subsidies for training to electronic assembly firms, could assist development in specific industries in the target group.

Selective interventions are, however, costly and could lead to problems and civil unrest when other firms or political lobbying groups demand similar treatment, or when such subsidies or legislation are to be phased out (Meier, 1995:261). Selective interventions could however serve a purpose to address specific market and industry imperfections or provide leadership and direction to the private sector (see Rodrik, 1996 & Edwards, 1997).

2.5.5 Functional Policies

Functional interventions are intended to improve the market conditions and economic climate, while selective interventions are specific activities. Both functional and selective policies should seek to improve free market outcomes. It is not always possible to distinguish between functional and selective

policies and these policies can be functional or selective depending on its intention, specificity and context (Lall, 2000b:3).

Functional interventions are regarded as market friendly as it intends to remedy the market without distorting it artificially. Functional policies could, for instance, support training to industries in general, improving the all over productivity of labour, or provide infrastructure and financing that will decrease transaction costs or assist in the availability of credit. The influence of globalisation, trade liberalisation, rules of the WTO and the GATT agreements are increasing the importance of functional policies as possibilities to adopt active and selective interventions are becoming less popular and in many cases impossible (see Rodrik, 1996:10). This compels governments to concentrate all the more on functional industrial policies.

In designing an efficient and appropriate industrial development policy, care should be taken to ensure that the correct components are included and possible negative results of functional and selective policies are limited. The next section considers the aspects on which a country has to focus its industrial development policy and strategies and how functional policies can assist in achieving such development. Special attention has to be given to ways to acquire and use modern technology so as to be competitive in the global context.

2.5.5.1 The Acquisition of Technological Capacity

Industrial development should focus on a country's ability to develop an efficient competitive platform, and particularly on the development and financing of technology, technological infrastructure and an advanced skill base. These aspects are considered in the following paragraphs.

Within manufacturing firms growth rates rise with technological intensity. Advanced technologies are the engine of trade growth (Lall, 2000a:9). The highest growth rates are for high technology, while the share of low tech and resource based production is declining. Resource based production grow the slowest. This means that the main areas of the comparative advantage of developing countries are declining. In order to survive less developed countries (LDCs) will have to adopt higher levels of technology and enable their labour force with the abilities to handle those technologies.

Technology contains strong implicit elements that involve effort and uncertainty. Technological capacity includes a very wide range of facilities and abilities that must be acquired to access, implement, absorb and develop knowledge that is needed in production. Technology cannot simply be transferred to a developing country like a physical product (Lall, 2000b:4). When new technology is acquired

technological effort are necessary to adopt it to local needs, whether that technology is new or mature in other regions or firms (Rigby, 2003:209).

The acquisition of knowledge and technology is typically post-modern in the sense that a predictable learning curve exists which other firms can follow. The absorption of new knowledge may be prohibit if the learning period is too long, inefficient, too costly, or if uncertainties and leakages are too high, if co-ordination with other firms in the supply chain is too difficult, or if information, labour and capital markets are unresponsive. In the absence of sufficient skills, infrastructure and cheap labour in regions simple labour-intensive activities may start, but this will not lead to increasing returns. Upgrading to more complex and demanding technologies will be impossible in the absence of interventions and leadership to overcome the high learning costs. Such interventions must be selective as technologies differ in their learning needs (Walker, 2003:125).

In under developed regions market failures will restrict the development of local firms and particularly small firms. Foreign investors tend to face fewer failures as they enjoy internalisation of intermediate markets for capital, skills and technology. This implies that multi-national companies (MNCs) are valuable for launching industrialisation (Page, 2003:249). Foreign knowledge is the primary input into the development of local capabilities. FDI and MNCs are therefore indispensable for the industrial development of less developed regions. MNCs can provide state-of-the-art technologies, finance and access to global networks and advance continued output and export growth (Leyshon, 2003:439). Greater technological deepening may thus be achieved through strong industrial policies that target foreign direct investments (FDI) together with selective investments in skills, technology and infrastructure, all directed at specific needs of industries.

Technological infrastructure facilitates technology and innovation as it presents a carrier channel in which technology can function and forms the base of a country's technological platform on which further development can occur. Technological infrastructure includes:

- Metrology, standards, testing and quality institutions – called the MSTQ structure
- Public, private and collaborative R&D institutions – that do basic, applied and contract research
- The Tertiary System – That includes universities and technical colleges that do basic research and applied work for industry
- Physical infrastructure that supports R&D – like science parks and technology cities
- Technical extension services – that assist small and medium sized firms

- Institutions that provide the human capital for technology. A significant part of knowledge infrastructure is intended to provide the "public goods" of technological activity; and
- Information on foreign technology – provided by institutions in other countries. They introduce firms to potential sources and suppliers of technology abroad, commercialise technology development in public research bodies, stimulate innovation networks and promote new firms (Walker, 2003:125 & Lall, 2000b:21).

Public institutions in African and most other under developed countries do not support productive technological activities. Research institutions are usually independent from the sectors they serve, conducting basic research of poor quality and of no practical use. Many are not following international trends; use outdated equipment, are not well managed and employ underpaid and unproductive personnel. Service providers such as extension or quality agencies are also under staffed and not well managed, and they do little to assist their clients. This leads to a situation where firms in less developed countries has little regards for public sector technology institutions and universities and underestimate its value (Sunley, 2003:193).

The institutions that provide the human capital for technological development gather information on knowledge creation in the world. They monitor trends and translate them to practical use, train people to handle these technologies, create new technology and disseminate information to firms and researchers. LDCs such as many in Africa have a nearly insurmountable problem in that institutions that provide the human capital for technology are nearly non-existent. Without an efficient human capital skill base and institutions to form the supporting infrastructural base, African industries will not be able to become globally competitive and remain so in a sustainable manner. The following section therefore focuses specifically on the development of a proper skill base for modern industrial development.

2.5.5.2 Education and Training

The base of skills in developing countries, with low levels of education and with capabilities acquired in protected markets, is to low to allow efficient competition in manufactured trade. Reaching 'best practice' levels of technology, management and marketing requires new skills, which are more advanced and varied than those needed to serve traditional local markets (Rigby, 2003:210). Relatively simple activities, like exporting clothing require low costs, very high quality, fast-changing and stringent specifications and rapid turnaround with reliable and timely delivery. Even low technology activities now require skills in technical, management, design, logistic and communication proficiency.

Production structures are shifting from simple to complex, technology-intensive activities and the need for skills are growing broader and more demanding (Rigby, 2003:205).

Policies that focus on the development of a highly skilled human capital base are becoming determinants of comparative advantage. Technology without the labour skills to apply and operate it is not worth much. The value of skilled labour as a major factor of production was highlighted in the preceding theoretical chapters and the endogenous growth theory indicates that a high degree of quality labour can lead to accelerate growth even with the existing capital base (Armstrong & Taylor, 2000:76). Investment in human capital can lead to sustained development, proficiency in the handling of technology and innovations that can create new technology and new or higher comparative advantages (Grant, 2003:413). The role of human capital in growth is widely accepted and as technology is developing, technical skills also need to develop to ensure higher growth paths. Comparative advantage in the developing world has to change from the traditional base of primary resources and cheap unskilled labour to manufactured products and services incorporating higher skills and technological inputs (Walker, 2003:125).

In the formation of skills, market failures arise at the level of resource allocation and deepening of the industrial and technological structure, but also at the level of the education and training system. Many skills vital to industrial upgrading and competitiveness arise, however, not from formal education and training but from the practical experience of mastering, adapting and improving specific technologies. This requires a skill base that is already proficient in the handling of technology to such an extent that it can lead to new innovations. It further depends on macroeconomic management, investment in the industry, the competitive environment and the use of new technologies. These factors are, however, often not sufficient.

Once the government accepts the necessity to change the technological structure of industry, the need for new skills become essential. In less developed countries where there are high, prolonged and unpredictable costs in mastering difficult technologies relative to existing capabilities, a fully liberalised policy regime is usually not conducive for the development of skills. It can obstruct entry into complex activities or more demanding technical functions (Lall, 2000a:22). With the development of new skills and where technologies need considerable adaptation and information to absorb and when there are extensive spill-overs, the obstructions can be even higher. In such circumstances development requires policy intervention and there might even be case for infant industry protection during skills and technology development. Co-ordination should be an integral part of industrial and education policies as it has to be ensured that the education and training system is co-ordinated with the industrial system as it develops (Green et. al; 1999:82).

Performance of the Southeast Asian Tigers indicates a significant correlation between economic growth and competitiveness and the level of skills available in a country (Lall, 2000a:17). Basic schooling, literacy and basic skills are a prerequisite to the handling of any technology, but are only sufficient to absorb simple industrial technologies. Simple basic technologies should also be complemented by higher-level technical and managerial skills. Advanced schooling and tertiary education become important as more complex knowledge is expanded. Sophisticated modern technologies require high levels of numeracy and a broad base of skills on the job, as well as a high proportion of technical personnel. The role of engineering merits particular attention.

When considering formal education, courses in natural science, mathematics, engineering (technical subjects) and computers should form the core around which a skills base should be build to foster industrial development. Other subjects like medicine, architecture, trade, crafts, transport and communication are also important. On the job learning, experience and training is also most important, but often difficult to measure. The same is the case when considering the curricula, quality and relevance of a particular country's educational system. Indirect proxies like the dropout or completion rates are often used but this can be misleading. African countries that lower their standards to achieve higher pass rates might seem to have better educational systems, while the actual human capital base as measured by the capabilities and productivity of the workers might be far worse.

The breakdown of tertiary enrolments in technical subjects is probably more relevant to assess the capabilities to absorb technological knowledge; of this, enrolment in engineering is probably the most significant. Fast growing LDCs enrol over 33 times the proportion of their population in technical subjects compared to Sub-Saharan Africa, including South Africa (Lall, 2000a:19).

In-service training by firms is one of the most important sources of skill formation. The current technological paradigm raises its importance, accelerating change in skills needed and making many skills very task specific. Developed countries and leading enterprises invest more in training than others do. Most firms and governments should also conduct more research and development. Training by firms can be an efficient and economical way to develop the skills of the labour force needed in a country. The costs tend to be lower than pre-employment post-school training, though firms lose part of the benefits of training if their employees leave. Firm-based training yields higher private returns than other post-school training modes, both in developing and industrialised countries (Lall, 2000a:19). Many firms do not provide training, despite its demonstrated gains in productivity and technological capabilities. Some firms are not aware of the benefits or methods of training, while others fear the loss of trained workers to other firms. Firms training are an essential complement to new investment in

technology, plant and equipment as well as new organisational methods. Many studies in mature industrial countries suggest that the shortage of appropriate worker skills is a major constraint on the adoption of new technologies, while well-trained workers accelerate development (Wood, 1998:1463).

Training is a form of investment and involves costs. Such investments are highly variable and government should play a role in promoting it. Large firms and the presence of training institutions enable training at lower cost. Payoffs to training depend on the technology used by firms, their export behaviour, and market growth. The lowest advantages to training are in Sub-Saharan Africa, as these countries utilise low technology and require mainly unskilled workers. Firms in Africa provide minimal on-the-job training; most are unaware of their skill deficiencies; and those that do, do not know how to go about training. Poorly educated workers are also costly to train, and make the introduction of new technology unviable. This is, however, short-sighted as increasing returns that follow on higher technology and better skills will newer be possible if African countries and their firms do not start developing their human capital as soon as possible. Poorly educated entrepreneurs and managers retard the training efforts. In the UK it was found that where training lags, industrial managers have low level of qualifications and often sit in a "low skills trap", where poor educational qualifications, weak training and low levels of technology used, interact with each other (Lall, 2000a:21). The same will be the case in poor countries with backward education systems and without public funds and institutions for training.

2.5.5.3 Improving Managerial Practices

The nature of competition itself is changing. Traditional modes of competition, based on low costs and prices, are being replaced by the 'new competition' driven by quality, flexibility, design, reliability and networking (see the new economic geography chapter 4). Firms are specialising in different segments of the production chain, outsourcing processes and services to reach higher economies of scale and specialisation (Grant, 2003:415). With globalisation and information technology, outsourcing is occurring across vast distances across national boundaries. Such skill intensive functions as handling information flows and networking are the new tool for competitiveness (Sunley, 2003:193). It is estimated that more than three-quarters of the value of a typical manufactured product is already contributed by service activities such as design, sales and advertising (Lall, 2000a:4).

New forms of company management and organisation necessitate new skills while employees benefit from the virtuous process of skill creation and upgrading. New skills are required in setting up new production systems, and to handle information flows and responsibilities, which have to be complemented by new work attitudes, relationships and management systems. The ILO (1998) identifies the following features of these practices:

- More teamwork and group responsibility
- More intense exchange of information
- Broader skills are required and frequent job rotation.
- Various off-line activities such as problem solving, quality improvement, health and safety.
- Organisational hierarchies are flattened giving more responsibilities to shop floor workers
- Higher emphasis on human resource policies, with training and remuneration systems adapted to prepare and reward employees for the new responsibilities (Lall, 2000a:4).

Specific communication skills are also required to handle the increased importance of networking between firms, and between firms and technology institutions or universities, while knowledge-intensive sectors are seen as most dynamic in terms of its 'learning potential' (Walker, 2003:125).

The role of technological learning in determining comparative advantage is important (Walker, 2003:125). Human capital that focuses on generic skills formed by formal education and training system is important, but specific skills necessary in productive activity are growing in importance. Here the building of capabilities are required in the context of the accumulation of knowledge, skills, information, work practices, external linkages and institutional structures needed to utilise technologies effectively and improve upon them. It is a much broader concept than innovation. Innovation is the creation of completely new technologies, but there is a large range of other activities learning, adaptation and improvement that is also relevant and important. In developing countries the latter constitutes the bulk of technological effort, and is a critical determinant of industrial competence and success (Lall, 2000a:5).

In the above sections attention was given to the components that are necessary for a prosperous and growing industrial sector and how this can be promoted. If designed with circumspection, industrial development can address aspects that could lead the economic growth rate of a country towards convergence with that the developed world and with that towards the economic development of its population. It was shown that functional and especially selective industrial policies do have a role to play, but it also has limitations. Some of the most important limitations are considered in the next section.

2.6 LIMITATIONS OF INDUSTRIAL POLICY IN PRACTICE

This chapter so far has indicated that there exists a good case for interventional policies. It was shown that it is easy to establish a theoretical case for interventions to promote industry and recent history has many examples where it was done with success. Unfortunately, many examples of failed policies and criticism also exist. The current liberalisation paradigm is partly a reflection to such failures (Lall,

2000b:26). That some failures occurred with interventions in some cases, do not imply that all interventions are undesirable. According to Lall (2000b:26-29) the most important limitations of selective industrial policies in less developed countries are:

- Lack of clear objectives
- Inefficient information
- Lack of skills
- Inflexibility
- Agency problems
- Sectional interests
- Corruption and the
- Level of Selective Policy

These limitations are briefly elaborated below.

2.6.1 Lack of Clear Objectives

Clarity of objectives is important. Government policies are often vague and contradicting. Tax rates might for instance decrease as an incentive for higher investment expenditure while interest rates are raised to fight inflation or to create employment through the substitution effect that will occur when the price of capital is raised. Vague and contradicting objectives make implementation difficult and inefficient. If the development process was left to the market it would have the advantage of a clear set of priorities that are imposed on policymakers and are easy to understand by all agents in the market. With market failure the advantages of the price mechanism do not however exist and clear interventional policies have to be set. In imperfect markets full information is not available and vague policies aggravates the matter.

2.6.2 Inefficient Information

In imperfect markets, like in under developed regions, deficient and asymmetrical information is a practical weakness. Often government may not have access to better information than firms have. Governments are however better placed to deal with the problems of co-ordination and externalities than individuals. Lack of information should, however, not be over-stressed and seen as a reason for the government to shed its responsibility.

When it seems necessary to pick winners or anchor projects, lack of information should not stop the authorities to do what seems optimal, for instance. A coherent and integrated range of interventions can create winners and/or initiate growth. When under developed countries choose technologies that were developed elsewhere, it is possible to obtain full information on the parameters involved. This is much easier that the picking of winners at the frontier of technological innovation, which is a problem

that advanced economies often have to deal with. Given the incremental and cumulative nature of technological learning, activities chosen should reckon with the existing skills and capabilities platform of the country and of the rate at which these could be increased. The error import substituting governments often made was to assume that the necessary capabilities, capacity and skills existed in the country, or would automatically be created with no additional costs and without proper information to substantiate it.

2.6.3 Lack of Skills

Modern industrial development demands a high level and availability of technical and administrative skills which less developed economies have very little of. Modern industrial policies are focussing on the more advanced industrial base and more adventurous strategy that require more and higher levels of skills. Education and training is a long-term investment that only delivers dividends after decades.

The degree of selectivity must be in line with the capabilities of the bureaucracy and the pace at which it can be improved. It is necessary to improve government's capacity to manage public resources, to deliver essential services and infrastructure to the broad population, and to create a safe and attractive environment for private savings, investment, and business activities. Governmental skills are limited in the less developed world and effort should be made to improve it, starting at the improvement of the social status of the civil service (Lall, 2000b:28). Both selective strategies and market friendly policies require strong administrative capabilities for the provision of education, management of competition policy, and the collections and allocation of revenues. Better training, selection, salaries, promotions and salaries can improve these skills and capabilities.

Effective competition policy will require expertise in a wide variety of sectors. Even governments will need to "shift gears and acquire new skills". The challenge is especially great for African countries since merely shifting gears is not enough – new skills and capacity have to be build, while the acquisition of new skills on firm level to build competitiveness should be a priority (Sunley, 2003:192). Michael Porter (1990) also indicated the need for constant upgrading and technological advancement for modern business to become and remain competitive.

2.6.4 Inflexibility

Industrial policy has to be designed with built in flexibility and interventions constantly monitored so that problems and mistakes can be rectified continuously. Export performance is regarded as one of the best ways to monitor export policies. Interventions often turn out to be much more costly than originally anticipated. There is usually little accountability for the outcomes and changing course is difficult.

2.6.5 Agency Problems

Rent seeking behaviour will always occur in a free economy and the more market failures there is the more opportunities exist. People often seek to utilise opportunities to the best of their advantage. Government officials might use selective policy funds to build large bureaucracies (empires) for themselves, strive to meet their own objectives, ignoring the policy objectives that they are supposed to achieve. Likewise, in the private sector funds allocated for employment creation and export promotion can easily be used to build up one's own company or enrich the owners. Incentives and monitoring mechanisms are necessary to ensure that policy objectives are met and contracts are enforced. Export performance can be utilised as a monitoring and allocational device, and banks can act as agents monitoring export policy (Lall, 2000b:28). Close contact between the government bureaucracy and industry must be promoted and regular meetings should be held between them. These measures were used by the Southeast Asian countries and yielded success. Industrial associations can also act as interlocutors and can ensure close co-operation with the private sector (World Bank, 1993).

2.6.6 Sectional Interest Groups

An agency problem can also exist when sectional interest groups confine policies to their own advantage to support their specific objectives. Such possibilities are always present but the danger is far greater with selective policies. Strong leadership and institutions are necessary and internal scrutiny on the allocation of favours, to ensure that group interests are not dominating national interests and priorities.

2.6.7 Corruption

Under developed economies usually do not have the monitoring and administrative capabilities to deal with corruption. At lower levels of employment corruption can be limited through changes in monitoring, employment conditions, salaries and incentives. At top levels this can, however, be a major problem as there are usually little means of monitoring and it's difficult to impose sanctions on offenders. If that were the case, especially when there is no real commitment to economic development, selective policies would be inefficient and wasteful. Bribery and corruption at the top will also tend to promote or protect offenders down the scale. Corruption also acts as a barrier to trade and industrial development (Grant, 2003:419).

2.6.8 Level of Selective Policy

The lower a government's capabilities, accountability and commitment, the lower the degree of selectivity that it can safely handle. The lower the level of selectivity, the lower the risk, but the lower the level of transformation of the competitive structure will also be. Government should choose

strategies on a realistic assessment of their capabilities and limitations. Unfortunately they usually do not (Lall, 2000b:29). External consultants and analysis may be employed to provide such an assessment, but there is no guarantee that governments will base their policy steps on those recommendations.

2.7 SUMMARY AND CONCLUSION

This chapter provided an overview of the approaches to industrial policy and practice. In this chapter it was shown that industrial development strategies and policies could be justified and its role in the competitiveness platform was studied. The first part of the chapter focused on the theory of industrial policy and was followed by a section on the industrial competitive platform. The second half of the chapter then considered industrial policy in practice.

As part of the theoretical framework section 2.2 indicated that the purpose of industrial policy is in the first instance to alter the economic equilibrium between demand and supply permanently in such a way that local industries will be able to conquer a larger section of demand and have the ability to supply those quantities. This implies that industrial policy should lower the marginal costs of firms, as it influences total supply. To move the marginal cost down requires production, addressing supply conditions, making production cheaper and more productive. Government policy can, for instance, improve infrastructure that would lower transport costs, the availability and costs of raw materials, and capital goods could be addressed, financial assistance could be provided, regulations on labour could change wage costs, and the average price level could decrease production costs. Section 2.2 then indicated that another important aspect of industrial policy would be to assist firms in the utilisation of modern technology. The productivity of the factors of production of firm's will increase with the acquisition of:

- Higher technology embedded in capital goods and
- Higher skills and knowledge embedded in labour enabling it to handle modern technology. The practical acquisition of these factors received attention in section 2.5.5.

It was shown in section 2.4.1 that the productivity of both capital and labour should improve simultaneously as production factors are complimentary to each other. Appropriate policy has to focus on cost structures that will enable firms to acquire and use modern technology. When production can increase while prices remain constant or at preferable decline, it will create employment and create sustainable wealth.

Section 2.2 discussed the objectives of industrial policy and first considered the theory of production as it is in the first instance individual firms that compete in the economy. It was shown that industrial

policy could have a direct impact on production and the ideal place for industrial policy to place focus on following the principle that intervention should be as direct and close to the intended subject as possible. Special attention was given to resource allocation, the choice of factor intensity and factor productivity. It was shown that proper research on the specific situation is necessary as capital-intensive production technology could also be advantages to a less developed country with an abounded supply of unskilled labour where labour-intensive production is usually preferential. This section also indicated the value of technology and innovation for industrial development. It emphasised the place of higher technology in industrial policy. Economic theory predicts that output and industrial development could be increased disproportionally higher in relation to the input factors of production when modern technology is applied.

In section 2.3 of this chapter the theoretical foundations for industrial policy are investigated commencing with the theory of second best and market failures. Sections 2.3.3 to 2.3.8 then focused on the role of international trade as one of the most important supports to industrial development. It was shown in sections 2.3.2 and 2.3.3 that international trade could provide additional markets to firms, as local demand in less developed countries like South Africa is low. International trade also provides a source of modern technology, knowledge, investment funds, credit and various other positive externalities that is necessary for industrial development. International trade is only possible if firms align their cost structures, prices and quality in accordance to international standards. This will make local firms more efficient and productive and ensure development of local industries.

It was shown in section 2.3.4 that growing global trade could create employment, raise welfare and increase living standards. The value of an export-orientated policy was illustrated and contrasted with import substitution in section 2.3.5. The value of imports for industrial development of less developed countries was considered in theoretical context in section 2.3.6, as the idea is often that imports should be restricted. Strategic trade policy and market protection was then considered in section 2.3.7. Tariffs were shown to be sub-optimal policy and the removal of trade restriction will at least in the short and medium-term lead to higher economic growth and welfare. Market failures do, however, often force authorities to apply second-best policies in less developed countries.

The advantages of international trade and globalisation are often emphasised without considering any problems that it can cause. In the study on the theory of industrial policy consideration was given to quandaries in trade and industrial development policy in section 2.3.8. The critical analysis looked at the static and dynamic effects of international trade as well as factor mobility, and policy dilemmas such as the choice between efficiency and equity. This section considered various criticisms, sometimes

expressed against industrial development, especially development with a trade focus. Special attention was given to the fact that global trade could harm the poor and the unskilled.

The chapter then studied the industrial competitive platform in section 2.4. This part of the study commenced by considering the drivers of competitiveness, then discuss the stages of competitive development and finally Porter's approach to competitiveness. This section provides a foundation for the empirical part of this study.

Industrial policy in practice was first considered in section 2.5. A stable macro-economy is essential for the micro-economic production and development of firms within an economy. The role of monetary and financial policies in support of industrial policy was discussed followed by a section on exchange rate policy It was shown that a devaluation of the exchange rate and a consistent macro-economic policy is required in the case of most LDCs. Firms cannot be internationally competitive if inflation causes them to be priced out of the market, inflation should therefore be addressed to obtain and maintain international competitiveness. Price control was also discussed followed by aspects of foreign investment, multinational corporations and the advantages and disadvantages of privatisation were noted.

It was illustrated in section 2.6.2 of this chapter that industrial policy will not function in practice as the theory predicts if other related issues are neglected. Industrial policy could not stand alone, but should involve various other policies and state departments in an integrated strategy. Better utilisation of modern capital goods requires a pool of skilled labour, which is the responsibility of the Departments of Labour and the Department of Education and Training, for example. An integrated strategy would require the participation of all role players and a well-planned propaganda effort might be to some advantage to get everyone to play their role in building the economy.

This chapter has shown that a need for industrial policy still exists in the new globalised economy. It studied the components that are usually included in an industrial policy and how governments set about to acquire it. It was shown in sections 2.5.2 to 2.5.5 that industrial policy could be sub-divided in the following categories:

- Active interventions and incentives
- Functional policies
- Selective interventions.

Traditionally active interventions and incentives formed the main core of industrial policies. Following the endorsement of the GATT agreements at Marraches in 1995 the international paradigm shifted in favour of trade liberalisation. Government actions are being restricted and active interventions and

incentives cannot be applied as before. At the same time, modern technology that includes communication, computer and information technology and engineering expertise, is advancing the effect of globalisation. The movement of goods, services and information are being accelerated, regardless of national boarders and all these developments are rendering governments powerless to manage trade and industrial development through traditional means. The contribution of industrial policy to development does not, however, consist only of subsidies and trade restrictions. There are a lot more that the authorities can do to promote industrial development.

Countries should exploit globalisation to the best of their advantage. What is required is not a total absence from all economic activity, but rather the designing of smart policies that can utilise the advantages of globalisation and liberalisation in their favour. Industrial policy must strive actively to develop modern technological competence in that region so that it would be able to compete on the international platform. LDCs and South Africa should not only be able to absorb Western technology, but have to develop their own and preferably reach the stage where they are the new innovators of technology themselves.

A case was made out for the role of functional and especially for selective industrial policies, but it also has practical limitations. The chapter therefore conclude in section 2.6 by gaving special attention to the lack of clear objectives, inefficient information, and the lack of skills, inflexibility, agency problems, sectional interests and corruption that are often disadvantages associated with this type of policy interventions.

Industries and especially manufacturing has to grow in order to provide the necessary commodities that are demanded on the market. Growth is even more import in the provision of employment to the population to earn income and alleviate poverty. This will only be possible if the county's manufacturing industry is globally competitive. Regional industrial development policy has to take note of modern global developments, and should be designed to exploit that to the full extent. This requires new and better policies and a stronger competitive platform than before with a clear focus to become and remain competitive.

In the following chapter the theories on industrial location and the way this could lead toward spatial development will be studied. A survey of the traditional explanations of locational decisions is surveyed, first followed by a more thorough study of modern explanations of the locational decisions of firms. Here attention will be paid to agglomeration and increasing returns, industrial districts, the specialised labour pool, specialised intermediate inputs, transport costs, historical factors, knowledge and technological spill-overs, and flexible production. Taking account of the theories on regional

development and manufacturing location will follow this and the chapter will conclude with a survey of the most resent research on spatial economics.

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CHAPTER 3

THE THEORY OF INDUSTRIAL LOCATION

3.1 INTRODUCTION

It was stated in chapter 1 that industry is seen as an engine of growth and that the establishment of industries are regarded as major creators of employment. In chapter 2 the theory and practice of industrial policy was considered. In recent years, industrial policy has also become focused on its spatial implications. Policy makers often wish to attract businesses to their less developed regions. Studying the factors influencing manufacturing location is therefore important and is the subject of this chapter.

This chapter is structured as follows: In section 3.2 attention is first given to traditional explanations of the locational decisions. The traditional factors that are important when manufacturers decide on a location to settle are described. These include the economic environment, services and essential infrastructure provided by the authorities, government regulations, the natural environment, and factors specific to the site, corporate objectives and proximity to headquarters, uncertainty, ambience and quality of life.

Section 3.3 concentrates on the factors that the current literature on economic geography focuses on in explaining manufacturer's location decisions. Agglomeration, specialised labour and specialised intermediate inputs, technological spill-overs and transportational advantages that all facilitate increasing returns are discussed in this section, including historical factors that tend either to strengthen agglomeration or lead to its decline.

Attention is given to the ways that the locational decisions of manufacturers interact with spatial development in section 3.4. Attention is given to the practical factors and the stages of the product cycle model, regional competitiveness and new generation policies. This serves as an introduction to the stages that a geographical region goes through during development according to the regional cycle

model. The last part of this section examines the spatial influence that new infrastructure, like a new highway, has on a region's spatial development patterns.

The last section, section 3.5, surveys and summarises spatial economic development and put the preceding sections of the chapter in perspective. The chapter concludes with a summary in section 3.6.

3.2 TRADITIONAL EXPLANATIONS OF LOCATIONAL DECISIONS

All locations usually present a set of locational advantages and disadvantages. The combination of costs, revenue and access to the market are the main determinants of manufacturing location. When erecting a new plant, virtually all manufacturers consider certain basic locational factors and influences and this may lead to specific spatial patterns like clusters. Different manufacturers will, however, attach different values and perceptions to the relative importance of these locational factors. Locational decisions are extremely complex and a large combination of factors has a simultaneous influence, and the importance of the relevant factors also varies over time. Manufacturer's localisational decisions are made on present uncertainties based on the available knowledge and information, looking as far as possible into an uncertain future (Chapman & Walker, 1991:52 & Wheeler, 1998:198-199).

In this section attention is given to factors that are important when industrialists decide on a location to settle. These include the economic environment, services and essential infrastructure provided by the authorities, government regulations, the natural environment, corporate objectives and site specific factors, uncertainty, ambience and quality of life.

3.2.1 Economic Environment

Characteristics specific to the site have a role to play in locational decisions. The size of the site, current conditions and the layout of the physical structures, the construction or re-modelling costs and insurance premiums will influence costs in the short to medium term. The price of the site and structures, the prevailing interest rates on loans and the estimated future resale value of the site and structures will also be considered. Companies' marketing, expansion and locational strategies are part of their long term planning and estimations about future procurement of capital inputs, sales and marketing, operations, technological development, after-sales service, company logistics, and human resource management will all be considered when locational decisions are made.

Considerations regarding the economic environment, the existing laws and the rules of conduct will influence location. Taxes and incentives are often utilised to attract investment (Meier, 1989:254).

Income tax, property and other local taxes are costs to a manufacturer and if tax breaks, tax holidays, grants, concessions and other incentives are available it would increase a manufacturer's profitability and influence the locational decision.

Government regulations pertaining to the natural environment will also influence location. The cost of compliance to pollution and other natural environmental control regulations will be incorporated into the cost benefit evaluation when determining the most profitable location. If these costs are too high a location might be disregarded (Hodge, 1995:107). Impositions of costs associated with future regulations will also be considered (Hanink, 2003:239 & Chapman, 1991:148).

Trade barriers and laws might lower competitiveness, while political stability in the region will benefit location. The internalised economies of scale in relation to the size or scale of operation, the type, location and size of existing and expected future competitors, and their expected reaction when a new company settles in a region, will all influence the establishment of new plants. When co-operation with established local industry is possible it would increase manufacturing investment in an area. This is also an indication to direct foreign investment that profits could be attained in that area. The availability and costs of capital could increase competitiveness of a region if it is available at a reasonable price (Wardrep, 1985:10).

3.2.2 Business Infrastructure and Services

Infrastructure is amenities and services that support economic activity in a particular area without directly contributing to the production process. The provision of infrastructure holds certain cost implications for manufacturers, increasing their competitiveness and profit margins. Everyone in a region enjoys the benefits of infrastructure, just like a road lamp giving light to everyone. Infrastructure has the characteristics of a public good and as such is usually provided by the government or local authority with little cost implications to the companies that benefit from it. Infrastructure increases manufacturer's profits without direct expenses from a single company. The more and better a region's infrastructure the more companies would decide to settle there as it would contribute towards their profitability and competitiveness (Van Rensburg, 1997:26).

If the roads and telecommunication facilities are of a high quality, enhancing the flow of inputs, market access and transportation of people and information making it easily accessible and cheaper, profits will rise and lead to more manufacturers locating in that region (Naudé, 2000:13). Better roads would lead to lower transport and transaction costs as well as other facilities. As traffic increases between growth points opportunities for entrepreneurs develop and manufacturing will start settling along that

axis. The same may be true about other forms of infrastructure, like buildings, housing, water, telecommunication, newspapers, electricity railways and airports, to name a few.

The availability, quantity and price of utilities and services provided by the state and local authorities are important to manufacturers to operate (Wardrep, 1985:10). Water, sewage, electricity or gas should be available at a reasonable cost. The same applies to quality roads, police and fire protection, medical facilities and other services. If a manufacturer has to provide these utilities and services for themselves the other advantages of the region will have to be very high to offset the cost of these. In most cases a manufacturer will rather locate to a site where al the municipal services are already available.

3.2.3 Quality of Life

Empirical research revealed that personal factors and local amenities have a marked influence on the locational decisions of many manufacturers (Wheeler, 1998:206). Community development, personal considerations, especially executive considerations like the proximity of a golf course or better schools and recreational facilities, personal and historic ties and friendships play a role in manufacturing location decisions. Some make economic sense as it yields other externalities that could benefit a company. A better environment might supply a better-motivated and productive work force, and many profitable contacts are won at golf courses, for instance.

3.2.4 Distance from Markets

Uncertainty increases with distance from the market. With distance price variability rises, leading to more conservative production decisions and lower profits. Uncertainty about input material supplies increases with distance leading to larger stock inventories, which is a dead cost to the manufacturer. As distance from markers increase inventories also have to increase (See Webber, 1972).

The importance of external economies increases with increasing uncertainty. New manufacturers experience more uncertainty and are therefore smaller and should locate closer to cities, industrial clusters or emerging growth points. This increases the availability of the needed external services as proximity to services and specialised inputs reduces uncertainty and costs. It leads companies to cluster and increase the degree of industrial concentration in order to lessen uncertainty (Sunley, 2003:193).

Increased competition and uncertainty about final demand expose firms to higher levels of risk than in the past and this can be compensated by external economies of scale and scope where agglomeration occurs in industrial districts (Helmsing, 1999:14). This leads even larger companies to disintegrate

vertically. Flexible specialisation thrives in rapidly changing and niche markets (Helmsing, 2000:7). Specialisation and flexible production can thus be a way to avoid risk and uncertainty.

3.3 RECENT EXPLANATIONS OF THE LOCATIONAL DECISIONS OF FIRMS

The so-called *"new economic geography"* entails literature that regards labour market pooling, the availability of non-tradable inputs and technological spill-overs as most important locational factors (Krugman, 1998:7, Isserman, 1996:37 & Martin, 1999:75). The dynamics of these factors provide advantages such as increasing returns at the level of individual manufacturer (Arthur, 1996:102).

3.3.1 Agglomeration and Increasing Returns

Manufacturers tend to move to areas that are more profitable. They prefer to locate near large markets, indicating high market potential (Isserman, 1996:37). Regions with high market potential find their advantages reinforced as more companies locate there (Krugman, 1995a:46-7). Places that are more densely packed enjoy a variety of external economies associated with such a location, like relatively lower unit costs of production, which can lead to increasing returns to scale (Harrison, 1992:472). Helmsing (2000:3) sees economies of scale as the principle cause of concentration.

The effect of globalisation and the need for flexible production processes make clustering in industrial districts increasingly important. Clustering leads to competitive advantages because external economies of scale and scope or location economies are achieved (Harrison, 1992:470). Supplies of capital or services are often cheaper. Higher levels of productivity can be achieved by clustering instead of dispersed activities. Higher levels of productive efficiency then translate into higher levels of personal income for every manufacturer in the cluster. Companies that cluster together provide competition for one another but also increase their profit margins (Porter, 1998:7). Porter (1996:85) found that geographical clustering of industries is a key determinant of a nation's international competitiveness and this is also true of the companies involved.

Individual firms are in a poor position to compete on their own. Large companies do not lack resources and can enjoy economies of scale and scope on their own. Smaller firms also lack the political voice necessary to influence their economic and political environment. In an agglomerated industrial district small firms can, however, compete by joint efforts, utilise supporting services and structures and pooling knowledge and resources (Helmsing, 1999:21). Clustering permit firms to engage in different forms of joint actions, which creates additional advantages.

Companies in a cluster not only enjoy the common infrastructure provided, but are also more innovative in order to survive, and it is mainly these factors that lead to the agglomerational advantages. Agglomerational advantages are therefore the gains and savings that results from the concentration of economic activities at one location or adjacent to such a location. It is the saving per unit that is acquired by a manufacturer if it locates within a cluster or emerging growth pole. Where agglomeration develops, external economies are attained due the interaction of companies' activities and this leads to higher gains for every company (Harrison, 1992:470 & Naudé, 2000:10).

Clusters are not homogenous in terms of firm characteristics, nor do they stay homogenous over time. Some firms also benefit more from clustering than others (Helmsing, 1999:31). Empirical evidence do, however, suggest that when companies cluster together agglomeration is obtained and profits are increased through economies of scale and local externalities that ensure increasing marginal returns (Arthur, 1996:102). Increasing returns at the level of the individual production site, savings on transportation costs and factor mobility lead to more agglomeration benefits (Krugman, 1995a:90). Increasing returns is an indication of inherent advantages to specialisation in an industry or region and this may lead to sustained growth for an industry and the region (Krugman, 1991a:6-7).

Giersch (1949:87) stated that the lower the transport costs and the greater the economies of scale, the larger will the market areas of the manufacturers be and the fewer will the number of manufacturers be. The location at the centre will become more favoured over time, due to the transport cost advantages and consequent scale economies in production. Over time these advantages cumulate and it leads to a dominant agglomerative core centre of manufacturing activity. As growth and the locational advantages cause capital accumulation at the centre, manufacturing redistributes from a spatially even pattern to one that is highly clustered. Globalisation and its consequent reduction of national borders as barriers to trade will also benefit the agglomeration process in this regard (Helmsing, 1999:1-3).

Increasing returns may be due to the advantages obtained from agglomeration, but it may also be due to better manufacturing processes by superior companies that can operate at lower production costs. Superior managerial, engineering or scientific personal or better tradesmen may set a manufacturer in a position where he or she is able to make savings per production unit and enjoy increasing returns (Vorhies, 1992:102 & Arthur, 1996:102).

In time, through experience and learning-by-doing, companies might become more productive and innovative discoveries can make manufacturers more productive leading to increasing returns. In a growth point were the benefits of agglomeration exits, other companies might share better infrastructure, specialised inputs, or through interaction with other companies learn how to employ

new innovations and start gaining increasing returns, as they enjoy these knowledge spill-overs (Jaffe, 1993,595).

Agglomeration indicates the potential innovative capacity of a region to provide a stock of external economies, social and economic capital and institutions (Helmsing, 1999:15). Transaction costs will eventually decrease for flexible companies, as proximity will translates into wider opportunities and matching needs and capabilities. Agglomeration in an industrial district or cluster leads to higher symmetry of information, and offers regulatory institutions, social practices and institutional support for technical innovations, which can increase a company's competitive advantages and leads to lower transaction costs. Although globalisation decreases the importance of location, regions do have institutional agencies and place specific characteristics that enhance production (Helmsing, 1999:15). Location will always remain important. Flexible production systems require agglomeration as many of the previously internal economies of scale and scope are externalised into networks of companies within an industrial district (Helmsing, 1999:17).

3.3.2 Specialised Labour Pool

Clusters and industrial districts provide a large labour market and provide an advantageous shared pool of skilled workers (Krugman, 1995a:50). It is to the advantage of manufacturers if a supply of workers with the special skills they require are readily available. Agglomeration benefits workers and employers. When increasing returns to scale and uncertainty prevail, both parties can benefit. Pooling enables workers with special skills to switch employment, while firms are able to recruit the labour needed, especially people with special skills (Helmsing, 2000:4). Owners of isolated companies often experience problems if specialised labour skills are not available. Even when a large labour force is available, it does not help the manufacturer if they do not possess the necessary skills. Manufacturers therefore curb risks if they cluster together with other manufacturers where a skilled workers pool is available (Krugman, 1991a:37).

As capital intensity increases the importance of specialised labour will, however, decrease. When industries automate and mechanise, location starts to lose its dependence on especially skilled labour. Krugman (1991a:62) claims that as industries mature they tend to become less dependent on the supply of a specially skilled labour pool, specialised inputs and knowledge spill-overs that sustain localisation, but its effect do not usually disappear totally. Wheeler (1998:192) also states that empirical research shows that proximity to the location of labour is decreasing in importance.

Flexible specialisation and the increasing importance of external economies of scale and scope necessitate the importance of an available pool of skilled workers again. Flexible specialisation results in further differentiation between highly skilled workers who are central to the core production processes within a company and the lower and unskilled workers that are engaged in manual work and the manufacturing of subcontracted components and inputs made by other firms. Former labour market rigidities will start to dissolve as flexibilisation leads to new forms of work and contracts (Helmsing, 1999:14). This will also lead to the flexibilisation of labour itself. Especially skilled workers with the ability to change and apply their skills in different production processes will become high in demand. This new division of labour contributes towards the external economies at the district level.

Labour market conditions, the climate and stability of it will also influence decisions to settle in an area. The ability to attract and retain skilled workers is important, but the size and militancy of the labour unions in the area will also play a role. If forecasts about and possible changes in labour market trends in the future were available, it would provide more information to assist the locational decision. Labour migration trends, labour productivity and trends in productivity, the available skills, and prevailing wages will all influence location (Wardrep, 1985:10 & Hammermesh, 1988:242.).

Labour-intensive industries that require unskilled labour can locate in low- wage areas (Wheeler, 1998:202). The new economic geography literature regards the availability of skilled labour as an important locational factor (Naudé, 2000:10). The best option is usually to locate in an area of surplus labour if skilled labour is not crucial. This supply of labour might put downward pressure on wages, although the wages and salaries in an area with a larger supply of skilled labour are often higher. It still makes sense to locate in such an area of higher wages when the labour is worth the expense. The productivity of a skilled labour supply is usually higher than that of labour in areas of lower wages and this imply that the manufacturer will be able to manufacture more output with the same amount spent. As manufacturing is more productive at a large pool of skilled labour this may lead to agglomeration of manufacturers at that growth point.

3.3.3 Specialised Intermediate Inputs

Large local markets have the ability to support efficient volumes of intermediate input supplies. In a growth pole, or where clustering commences industry specific inputs would more likely be found, including non-traded inputs (Krugman, 1991a:37). This makes localised industries more efficient and reinforces the development of a localised growth point (Naudé, 2000:10). In an area where many companies manufacture the same goods it will be profitable for subsidiary industries to buy specialised and expensive machinery. Specialised capital equipment that focuses on one small branch of a

production process can pay its expense if it is rented constantly to various manufacturers. Readily supply of these inputs in a region will make settling at that location more attractive to a new manufacturer (Marshall, 1930:279).

Specialised inputs and services can more easily be supplied in a localised area where many industries utilise these inputs. This makes the supply of these inputs more efficient and reinforces localisation and agglomeration (Krugman, 1991a:49). The supply of these specialised inputs depends crucially on economies of scale. Only when demand for these inputs is high enough will it be profitable and will agglomeration continue in the longer run. Without economies of scale the supply of specialised inputs and skilled labour would be inefficient and not sustainable (Krugman, 1991a:49). It is the ability to obtain increasing returns in larger centres, which makes those locations more efficient, more diverse and more profitable.

Additional expenditure on a manufacturing plant and equipment enhances the profitability of other companies' existing operations. These companies gain benefits without having to pay anything or not the full cost when other companies make new real investments; this is called "pecuniary external economies". The output from a new plant may, for instance, provide cheaper or higher quality inputs to another producer in the same location. New facilities often attract customers too. New private investment might encourage the government to repair and upgrade infrastructure, which will again benefit all companies in the growing district. The extended benefits may also lead to increasing returns. Pecuniary externalities thus refer to the dynamic impact of one company's new investments on the possibilities to increase the profitability and expansion of other companies (Harrison, 1992:472).

As long as external economies are expanding, firms can obtain increasingly diverse inputs at lower prices. Rising transaction costs that occur as purchases grow may be compensated by real or virtual increasing proximity of producers and other supporting systems and this may lead to further spatial concentration.

The availability and cost of energy may have an influence on manufacturing location (Wheeler, 1998:205). In areas where the price of electricity is very low, that might not be regarded as a locating factor, but if large volumes of energy are utilised it will still have an effect on costs. Where manufacturing process uses much energy that is generated with large volumes of coal, location near coalmines might be an important factor.

The importance of extractive or acquisition costs of raw materials and the quality of deposits may influence manufacturing location. When the costs of input materials are high relative to the other costs,

plant location may be determined adjacent to the lowest average cost deposits or supplies (Wheeler, 1998:205). Literature on new economic geography the availability of inputs is also given as important, and specifically the availability of specialised intermediate inputs is regarded as an important locational factor as this could lead to increasing returns (Krugman, 1991a:37 & Arthur, 1996:102).

In some instances it might be more profitable to locate near the source of raw materials, like in the processing of freezed french fries for instance. Vegetables, especially halfway processed, lose weight when transported due to water loss (Service group, 1997:71). This implies that locating the processing unit near the source of inputs might in some cases be more profitable, but most often this is an exception to the rule.

Locating close to the market avoids transport charges on materials added during manufacturing (also see section 4.3.4). To conclude, the factors playing a major role when locating near the demand market are the higher freight rates on manufactured products, the weight gain during manufacturing, perishability, transaction and communication costs, and convenience.

Access to markets and distribution centres may have a special influence on the manufacturer's decision on location if the ability to compete and penetrate local and regional markets can be clearly forecasted beforehand (Wardrep, 1985:10). When the trend in sales by geographical area is known, these estimations will assist decisions. The costs of serving the local and regional markets will be taken in regard to make a proper cost-benefit evaluation.

Locating a manufacturing plant near the demand market may be at the expense of higher processing costs (Wheeler, 1998:201). Manufacturers near cities or metropolis usually experience higher costs of rent for land, higher wages, and higher taxes and transport congestion. Less developed areas, especially rural areas, may attract manufacturers to their regions due to the benefits they can offer in this regard. The optimal location will occur at some distance from the market, as maximum profit is a trade off between minimising production costs and maximising sales revenues.

Agglomeration, urban areas, growth points and economic networks are often an indication of a profitable location for other producers. It might be an indication of lower acquisition and transport costs, lower costs involved in the movement of materials and people between facilities or easier access to supplies, resources, material or personal (Wardrep, 1985:10). When information is available concerning the future trends in supplies of a region and favourable estimations about these trends could be made, it might influence locational decisions.

3.3.4 Transport Costs

Concentration provides firms with the opportunity to share local infrastructure leading to lower costs. If input, demand and retail markets were far away or difficult to reach it would increase manufacturing costs. On the other hand, developments like those in computer technology, telecommunications and jet travel, makes distance and location less important (Wheeler, 1998:188). Isard *et. al.* (1998:50) observes that transport cost is not the only cost factor to consider when manufacturing companies make locational decisions, but that many other cost factors are also important. McCann (1998:51-54) uses the "Logistics-Costs Model" to show that transport costs are only one factor and usually ads little towards the total cost package. In South Africa transportation cost on exported goods contributes about 21% of total costs and it is even higher in European countries and America (Naudé, 1999a:70). This also indicates that transportation costs should be an important component in cost planning. Others like Makie (1998:377), Wilson (1991:125), (Isserman, 1996:39) and Venables (1998:3) insist that location does matter in the decisions of manufacturers.

In 1929 Weber claimed that firms that utilise pure materials that are regularly and easily available will not be tied to a material site and locational decisions will be based on other factors closer to the market, except when there is a high weight-loss in the production process. Manufacturers always choose an optimal location intermediate between material inputs and the market. Weber posited that the optimal location is where the savings from agglomeration are precisely offset by the added transportation cost for each manufacturer (Chapman, 1991:36-39).

Weber's theory did not regard geographical variations in market demand, and terminal or handling costs as important. Transport costs are also not always proportional to distance and weight. Empirically, transport is seldom found to be the single most important locational determinant, and its' importance seems to be declining (Wheeler, 1998:219).

Isard (1949) selected an optimum manufacturing site by evaluating the substitution of expenditure of the various factors of production (see e.g. Isard, 1997). This analysis is similar to microeconomic analysis utilising indifference curves or isoquants. The basic idea is that optimal maximum profit point to locate at, is the lowest cost point on the transformation curve tangent to the cost layout line. This model neglected the distance from the consumer market and the revenue thereof, but in principle it says the same as all the other models, old and new.

Lösch (1954:27) stated that when a product is shipped to another location the freight cost would increase its price and lead to a decline in the quantity demanded at locations further from the point of

production. Transportation cost handicaps commercial activity in this way, but this problem can be curbed by economies of scale. Lösch also noted that the correct location is where the manufacturer maximises its' net profits. He largely ignored costs in the maximisation approach to industrial location however, and over emphasised demand and sales (Chapman, 1991:39).

Smith's (1981) model of spatial margins assumes that processing costs and revenues vary in space. This model combined the approach of Weber, where costs varies but revenues are ignored or assumed constant everywhere, with Lösch's theory where revenue varies through space but costs remains constant. The resulting optimal locations remained the same though. The contribution of Smith lies in the incorporation of sub-optimal behaviour into industrial location theory. The model also recognised non-economic factors influencing industrial locational decisions, as it also reveals spatial margins to profitability away from the optimal point (Dicken, 1990:97-103).

Manufacturers prefer locations where demand is large or the supply of inputs is particularly suitable or its costs justifiably lower than other locations. Generally this is the location chosen by other producers. Once a concentration of industry is established, it is profitable for new producers to follow making agglomeration self-sustaining because transaction costs increases across distance and this forms part of the profit maximising behaviour of firms (Krugman, 1991a:98). Manufacturers will locate where production cost is the lowest. Manufacturers then concentrate in one location in order to obtain economies of scale, while utilising other mutual benefits like infrastructure. Concentration of production might even pay to locate where costs are slightly higher but access costs are lower (Krugman, 1991a:96).

When firms are located close to each other, savings on transport might be obtained. This leads manufacturers to locate on a transportation network or at clusters (Nijkamp, 1998:5). The larger such an emerging growth point or node is, the larger the advantage due to transport savings will be. As an agglomeration point develops, transport costs will decline. Manufacturers that locate near each other benefit from successive stages of production. A strategic point on a transport network will also ensure transport savings even if inputs and markets are dispersed from the manufacturing plant.

The nature of inputs is also an important factor. The transportation of beverages over long distances might not be cost effective for instance, because water is everywhere available, ceteris paribus. In such a case it might be more cost effective to locate a number of smaller manufacturing plants near the retail markets (see e.g. Wheeler, 1998:199). In this case scale economies are of little importance.

Transportation costs of raw materials often costs much less than the manufactured products. During manufacturing there usually is a weight gain making the transportation of final products more expensive. Location near the retail market is therefore more profitable (Dicken, 1990:132-134). This implies that the market becomes increasingly important in the locational choice of manufacturers (Wheeler, 1998:199).

External effects are even more important in the new economic geography literature (Naudé, 2000:14). Distance is important in the acquisition of scale economies. When the fixed costs of localised production are low, relative to high transport costs, production is spatially dispersed. When the fixed costs of localised production are high, relative to low transport costs, agglomeration takes place (Krugman, 1998:8). A general reduction in transport costs, of both intermediate and final goods will reinforce the development of a localised growth point (Naudé, 2000:10). The effect of new infrastructure could in the light of this, influence manufacturer's locations. Physical and economic infrastructure are also needed to generate dynamic flexibility in a region enhancing the attractiveness of a region to new business developers (Helmsing, 199:17).

Localisation due to distance and transport costs can be a function of various factors, either on the side of input factors of production or at the point where production is sold, or both. Localisation may occur when the cost of transporting intermediary inputs is particularly low compared to that of the final goods. When the costs of both intermediaries and final goods decrease it will tend to encourage localisation. When interaction between increasing returns, transport costs, and the size of market demand also play a role, the location becomes even more important. The manufacturer's location will be where demand is large or the supply of inputs is convenient.

Concentration of manufacturers will be attracted to locations where large local markets, with a relatively high population exist, and the benefits of the fixed costs surpass relative transport costs (Krugman, 1991a:24). It follows that when transportation costs forms a large part of the total overhead costs, location will matter more. Krugman (1991a:111) states that *"when transportation costs are zero, location is irrelevant"*. Although this is not absolutely true (see the section flexible production and industrial districts), manufacturers will wish to settle were transportation costs would be minimised. If it were relatively more expensive to transport raw materials, manufacturers would prefer to locate near their input market. If transportation costs to the seller market were relatively higher, location near the market would be preferred.

Historical factors have a role to play in the concentration of manufacturers (Krugman, 1991a:24). Manufacturers will leave less profitable areas and move towards more desirable sites reinforcing the

advantages of the already favoured locations (Krugman, 1995a:62). If a higher concentrations already exists in some areas, and hence a higher supply and demand there, greater volumes of transportation will exist between these locations than at others. This will imply lower transport costs in the areas with a larger concentration of manufacturers, and this will in turn reinforce the already exiting advantage for manufacturers to settle there (Isserman, 1996:42). The importance of historical factors in the decisions of manufacturers concerning location will be discussed in the following section

3.3.5 Historical Factors

Krugman (1991a:66-67) notes that *"at ground level there is a striking role for history and accident"*. Small accidental events start a cumulative process in which the presence of a large number of firms and workers attract even more firms and workers, concentrating at a particular location. Underlying resources and technology may cause this pattern.

There exists a cumulative process in which agglomeration presents large local markets, which attract new industries, enlarging local markets further and attracting more industries (Myrdal, 1957:49; Pred, 1966:12 & Krugman, 1995a:92). The initial advantages developed by historical locational factors then lead through cumulative causation to further development patterns. (Krugman, 1995a:92). There is also a problem with the direction of causality in economic geography. There exists a circular relationship in which industrial concentration both follow and create markets (e.g. Krugman, 1995a:92 & Chrisholm, 1990:25). Firms locate near large markets, and large markets are where many firms locate. (Krugman, 1995a:46-49).

Although specialisation may lead to economies of scale and scope in a region, specialisation may also make regions prone to random external shocks. Shifts in demand may, for instance, render an entire industrial base of a region obsolete (Helmsing, 2000:6). The advantage of agglomeration is, however, in the symmetrical distribution of information. When market trends start changing, firms are in a better position to adjust in time than those isolated in remote locations are.

Agglomeration may be opposed by centrifugal forces in the presence of immobile factors (Krugman, 1996:7 & 1998:8). The forces working against give incentives to set up new facilities to serve the dispersed rural areas. Centrifugal forces work against the historical factors that determine agglomeration. These counter-historical centrifugal forces are especially active where companies wish to avoid competition or congestion. The centrifugal and centripetal forces work against each other. The final outcome will depend on the size of these forces in a region as well as other locational factors (Krugman, 1995a:91 & 100).

3.3.6 Technological Spill-Overs

The most important feature of the new economy is its application of modern technology and the profits obtained from it. When firms cluster together in a large local market, they benefit from the information exchange that takes place (Krugman, 1991a:37). Various authors, like Jaffe, Trajtenberg and Henderson (1993), Audretsch (1998) and Krugman (1991) gave much attention to the effect of innovations, technological and knowledge spill-overs in studying the new economic geography. Next to pure technological spill-overs, information spill-overs, as well as pecuniary externalities associated with demand or supply linkages, are also important when manufacturers cluster together as this put them in a position to obtain better production functions and higher profits.

Actions of one company that causes another manufacturer to obtain prices above its' marginal costs, implies a real externality just as if one company's research and development spilled over into the general knowledge pool (Krugman, 1991c:485). Technological, information and knowledge spill-overs from the interaction of companies on other dimensions are important locational factors as knowledge-driven innovative activity is becoming the main source of comparative advantage of high-cost economies. Helmsing (2000:2) notes that learning and collective learning can achieve higher levels of innovative capacity when organised at the district or regional level. In evaluating South Africa's industrial competitive platform in chapter 5, the extent to which these spill-overs are utilised and employed with new technology and innovations will have to be established. Industries need new technology and need the expertise to develop new technology that are specifically suited to their needs, and to reach the level of competency where new technology could either be developed or transformed, firms need to gain some know-how from other firms and in this regard spil-overs are most important. The next section discusses spatial development patterns of a region and how it interacts with the development of industries in a region.

3.4 THEORY AND PRACTICE OF REGIONAL DEVELOPMENT

In this section attention is given to the spatial patterns associated with the locational decisions of industries. Attention is first given to the practical factors and the stages of the product cycle model. This serves as an introduction to the stages geographical regions go through during development according to the regional cycle model. This section ends with the examination of the spatial influence new infrastructure, like a new highway, has on a region's spatial development patterns. It influence on the locational decisions of companies and how it correlates with the factors that the literature new economic geography regards as important for manufacturing development.

3.4.1 Practical Factors and the Product Cycle Model

Considering the theory in relation to the practical situation influences manufacturer's location decisions. The Product Cycle Model states that the manufacturing of a product goes through a series of phases, namely the initial growth and mature phase (Hayter, 1998:108 & Chapman, 1991:126-130).

During the initial phase the products are still being developed. The most important development during this phase is scientific and engineering technology. This stage yields the largest profits and economic growth, but the level of skills and the nature of inputs will force manufacturers to settle at a large growth point, probably a city or metropolis (Benarroch & Gaisford: 2001:291).

High-technology industries follow a similar life cycle pattern. High-technology industries are mainly concerned with the development of capital goods, employing highly skilled people, new scientific technology, and it utilises high proportions of research and development. They will cluster mainly at larger growth points like cities and metropolis, where a skilled labour pool, research facilities and knowledge spill-overs are possible as predicted by the new economic geography literature (Krugman, 1998:7).

Rapid growth to satisfy large market demand is the main feature during the growth phase. The most important factors of production during this phase are managerial and capital. Optimal locations are near larger metropolis and suburbs. Manufacturing will spread from the larger cities to intermediate and smaller places located close to each other (Chapman, 1991:126-130).

In time manufacturing becomes standardised and easily copied. When the mature stage is reached production is stable and it slows down. Capital investment is still needed, but the labour requirement is now mainly unskilled. There is little need for scientific and engineering know-how as production has become standardised. In this stage the number of producers declines. This decreased competition lowers the importance of management. Capital is usually relatively mobile, and because the labour requirement in this stage is mostly unskilled and cheap the optimal location does not have to be at large growth points anymore. The kind of labour required is typically available in non-metropolitan areas, often in the peripheral and rural areas, as well as in less developed countries. Labour in most less developed African regions is unskilled, inexpensive and not unionised, indicating potential for manufacturers of the mature stage to locate (Collier, 1997:106-114). The spatial development stages are considered in the following section.

3.4.2 Stages in Spatial Development

Regional production systems compete with each other and the effect of increasing global interaction and exchange increases the competition among regions. Regions compete against each other to attract industries and this puts pressure on regional production systems to adapt continually. Regions in which co-ordination, regulated competition and supporting institutions are weakly developed face problems and predicaments that compromise its long-term viability (Helmsing, 1999:16). The viability and strength of a region depends on the existing companies as well as on the regulatory, co-ordinating and supporting institutions of a region. Contemporary flexible production agglomeration also depends on the effectiveness of institutions at the regional level. Regions compete against other competitive regions that possess effective regulatory and co-ordinating services, and if a region cannot offer the same institutions the region will start deteriorating and lose manufacturers and economic growth.

Spatial patterns in manufacturing develop quite similar to the product cycle model. The regional cycle model maintains that an industrial region goes through a sequence of changes from youth, mature to an old age cycle (Chapman, 1991:145-169).

The industrial youth phase is a period of experimentation and rapid growth of an area. Markets expand rapidly as the relative locational advantage of the area is quickly recognised by others. Investment capital rushes in and new technology is either developed or imported, inducing further growth. Managerial expertise is attracted by this vigorous growth. The young industrial area has the competitive advantage of producing at low cost and to market over a wide geographical area enabling increasing returns and economies of scale (Thomson, 1966:356-365). As profits are largest in the initial stages of product development continuous innovations are essential for a region to survive.

Development of an industrial region leads to its dominance over other regions as the industrial mature stage is reached. Managerial personal is exported to other areas due to their know-how and expertise. At this stage, competition increases severely as other areas compete for a share of the manufacturing sector. Subsidiaries or branch plants and supervisors of the original companies will now locate in other areas to curb competition from there. The mature industries are still able to maintain a comparative locational cost advantage at this stage.

Manufacturers are located relatively close to each other and by being functionally related through linkages and other interactions, can provide a basis for employment creation. Large growth poles or cities are attractive to manufacturers as it has large markets; better access to the surrounding regions, and national markets as it has better transportation links and services. It also has larger pools of skilled

workers and often offers convenient business services, finance, warehouse facilities, access to intermediate inputs and relatively quick and inexpensive communication links, all of which is important locational factors for the new economic geography literature (Isserman, 1996:38).

At global scale similar arguments as those in the previous paragraphs are also true. The world economy continues to change in response to better computer and communication technology and increasing mobility of production factors, expansion and diversification of international trade, geographic expansion of services, and the concentration of those services, to name a few. Larger cities have large advantages over small cities and rural areas that attract manufacturers (Brunn, 1991:206-211).

In the industrial mature stage a complex web of interdependencies develop and intensify within the production system. Production becomes more specialised and the demand for specialised labour more pronounced. This leads to a dense self-supporting flexible production network with a large range of transactions and linkages among producers, and a unique set of labour markets and community relations that give rise to a co-operative social structure (Wheeler, 1998:229-230).

Economies of scale can be obtained through mass production in this stage. Flexible production, in contrast, permits manufacturers to operate efficiently over a wide range of scales, and produce smaller batches of unique products at a fairly low cost. New growth centres based on flexible production have emerged in numerous regions around the world, especially in locations away from the traditionally large manufacturing clusters.

Manufacturers can achieve competitive advantage in the modern business environment if they are flexible, quality driven and focused on customer needs (Nijkamp, 1998:5). Flexible production requires firms to work as though they are all essential parts of an interconnected network. Manufacturing networks provide a medium in which a number of companies can combine their efforts to gain competitive advantage. Viewing its identities as a network enables manufacturers and sub-contractors to enlarge its market share and profit margins. In such a network they act according to the objective of enhancing customer satisfaction. This is attained through the ability of options to meet the needs of a diverse and ever changing market, with an assurance of product quality and value, and prompt delivery times of products at intermediate and final stages of production. The aim is to eliminate wasteful operations that do not contribute to the value adding process. This is the essence of the Just-in-time-production paradigm (Linge, 1991:330).

As a region reaches the old stage of industrialisation, its cost advantages are largely lost and increasing returns to scale are not realised anymore. Markets have shifted significantly, better and cheaper sources

of raw material inputs have become available, and adequately skilled labour are now available in other areas at lower costs. Buildings and machinery of manufacturers have become obsolete. Taxes increased markedly, and the competitive uses of land are encroaching on plant sites, restricting expansion. At this stage congestion is a problem. During this phase top managerial personal may be attracted to other areas, leaving only a few small family run establishments with little entrepreneurial skills (Chapman, 1991:177).

It is important for a region to try and maintain its cost advantages when it is experiencing growth. It must be innovate and improve its production processes continually to increase productivity continually and stay competitive. As long as this is possible a region will continue to develop, otherwise the region will deteriorate in favour of other regions.

The results of too much development in the past eventually lead to diseconomies when a congested region develops. Transport systems becomes clogged, land use is intensified, with high rent, and great strain is placed on resources like water, fire and police protection, sewage disposal and other environmental problems occurs. These problems increase manufacturer's costs, decreasing the original advantages of agglomeration. This leads a congested region to become depressed, especially when new markets and resources elsewhere are attracting investment. Many regional development strategies focus to a large extent on the provision of infrastructure and are therefore considered in the following section.

3.4.3 Regional Transport Infrastructure

The development of new infrastructure can induce similar development patterns as the spatial patterns of industries. A newly built highway will, for example, service the existing population by substituting an older transport route, like a railway, for a new one (Watts, 1987:214-215). This substitution phase will commence as soon as the new route is opened. Some users will, however, be slower than others and some may not change at all.

The mere existence of the new highway creates part of the demand for its use; reminding one of Say's Law that states that supply creates its' own demand (Isserman, 1996:37). In practice, people start to migrate during the transition phase, creating higher population densities and increasing the value of the land near the highway. The highway eases transportation and mobility and presents benefits to the residents and businesses. The higher use of the highway stems from induced demand.

The new highway will eventually start to determine the location of economic activity and changes the use of land when the final development stage is reached. At this stage the transportation route is a fully integrated part of the economic system and a further demand for highway services is created. At this stage the locations along this growth axis presents various advantages for new manufactures to locate there. There will be specialised inputs, services and pool of skilled workers, overhead costs will be lower for manufacturers stemming from the availability of these factors of production and the new infrastructure. The savings in production costs may lead to increasing returns (Arthur, 1996:102), which the new economic geography literature sees as the most important locational factors in a modern economy (Naudé, 2000:10 & 13).

The impact of the new highway on the economy of the region will vary from place to place along the route. The transportation-induced changes in economic activity at specific locations may include changes in the pattern of retail sales, manufacturing, residential land use, agriculture, and land values. These factors are also interrelated and its impact is both positive and negative. The transportation induced changes in production and consumption patterns may lead to positive changes at some locations and negative changes to others. Some people and businesses will benefit from this development while others will be hurt economically (Wheeler, 1998:101-103).

The most widely observed feature when there is investment in infrastructure is the increase in the values of land near a new highway. Land values rise sharply, especially at locations where routes cross. Land closest to the new highway achieves the highest prices, and the value decreases steadily away from the road. This spatial variation in land values indicates the premium placed on accessibility to an economic system and the benefits accessibility brings (Wheeler, 1998:101; & Fujita, Krugman & Venables, 2001:16).

The value of land for residential use will increase near a new double lane road. The widening of the road to four lanes will cause an increase in land values out-pricing the residential use thereof. Adjacent to the new highway commercial and industrial ventures will then settle, while residential housing will settle further away because residential areas are less dependent on accessibility.

The substantial transformation of a transport route, like the erection of a new highway, will cause economic activity to become spatially more concentrated. Small shops in villages are, for instance, replaced by large centralised shopping centres. Large producers that can achieve economies of scale due to their more accessible location on the new transport route force small manufacturers that are dispersed spatially operating at high unit costs, out of business (Wheeler, 1998:103).

In the United States' economy the repetition of this phenomenon resulted in a high degree of spatial concentration of economic activity in large metropolitan areas. The formation of metropolitan areas was largely possible due to transport improvements (Cooke, 1995:231).

As a growing district enjoys the agglomerational benefits of transport improvements, decentralising tendencies will also be induced. Centrifugal forces will cause industrial societies to spill over its locational boundaries leading to sub-urbanisation. One kind of manufacturing attracts another and people are drawn there. Mapped over time, manufacturing appears to spill over from its initial location and diffuse over the landscape. This is due to the fact that locational advantages change over time and various diverse factors influence locational decisions over time. This spread is not even and concurrently in all directions and the diffusion process can also reverse itself or be redirected (Wheeler, 1998:103).

The easier mobility and speed obtained from a new transport route enable places that are located far apart to function as if it is close together, forming a typical network. This deprives small villages near cities or metropolis of its economic function, but often raises their residential potential. This may reach intolerable excess and congestion in the growth point but the higher locational flexibility of decentralisation can prevent it.

Smaller centres have the advantage of lower land and labour costs. Manufacturers in these areas often focus on slow-growing industries and manufacturing that are more orientated towards raw material processing like agro-industries. Most manufacturers will, however, avoid smaller villages and towns as it offers fewer advantages than larger growth poles. Its markets are smaller, transport connections are less developed and many services and opportunities do not exist in smaller towns and rural areas. Wages in these areas are often lower to absorb the costs of transporting goods to the city (Isserman, 1996:38), this is not always the case and the transport premium is never as large as the wage difference.

Industrial processing zones are a practical example of locational development that employs both the traditional and modern principles of industrial settlement discussed in sections 3.2. and 3.3 will receive attention in the following section.

3.4.4 Export Processing Zones

Ryan (1994:13) illustrated that the more competitive exporting countries like Japan, Korea and Singapore found that investment-promotion needs to focus on selective targets and industries in locally specific areas. When specific development nodes are identified due to their potential for agglomeration and export focused production and service countries can promote exports and improve international

competitiveness. Export processing zones (EPZs) can serves as a catalyst for the development of strategic recourse intensive industries as well as the clustering of related industries. It can be a node from where further developments can spill over to the rest of the country. EPZs achieved success in various countries, especially in the Far Eastern countries like Malaysia and Taiwan. An EPZ can be defined as an economic node, zone or area where the production of goods and services are mainly for export. An EPZ are located in a specific geographical area within a country where various economic activities are promoted by a set of policy instruments that are not generally available to the rest of the country (Dippenaar, 2001:18). In these zones export production, especially by foreign countries, is promoted through special incentives like tax holidays, cheaper labour, lower tariffs and/or other trade restrictions, special exemptions from laws and regulations that could restrict the growth and competitively of individual firms. Governments usually focus on the provision of excellent infrastructure in these nodes and attempt to provide higher skilled labour to these nodes. Such zone are developed as part of South African's industrial development policy and are called Industrial Development Zones (IDZ). Spatial development initiatives (SDIs) are related to EPZs but consist of a broader geographical area in a province where different economic activities can take place (Newman, 1998:42). EPZs are, however, smaller nodes that focus primarily on manufacturing intended for the export market and the attraction of FDI. EPZs provide platforms to the business environment that offers speedy decision-making, attracted benefits, high quality inputs and labour at competitive rates, and an environment which provides easy access to global markets (Dippenaar, 2001:167).

Various developing countries have adopted support measures for international competitiveness such as export processing zones because of the high wages and production costs that local firms face, which erodes their competitiveness (Newman, 1998:42). Following the signing of the Marrakech agreement and the establishment of the World Trade Organisation (WTO), market liberalisation led to pressure on South African firms to become more competitive while trade restrictions and protection are being removed. Suleman (1998:25) identified the need for special measures to assist manufacturing firms to adapt to this pressure. He states that *"The shift away from import substitution towards export promotion and international competitiveness necessitates that measures be identified that can assist domestic manufactures to compete in international markets.* Bloch and Lewis (1998:740) studied the success of government intervention in South East Asia and Latin America and argue that the role played by governments should be more than just providing physical infrastructure and setting the rules of conduct.

Activities in export processing zones vary from bonded warehouses, export processing and assembly plants, port or cross-border trade, hi-tech research and development, to trade related transport and financial services. The activities in EPZs are diverse although the focus is mainly on the promotion of export-orientated manufacturing (Ge, 1999:1). Following the importance, foreign direct investments

are concentrated on foreign companies, and multinational firms are attracted through various incentives. Locating in an EPZ would decrease firms' production and operating costs leading to higher profits. The advantages to the host country are the creation of employment, improved capabilities of foreign exchange earnings, trade expansion, and the acquisition of advanced technology with the capacity and capabilities to apply. EPZs do not create comparative advantage in itself but it contributes towards the elimination of most of the obstacles that make investors unwilling, or reducing their ability to take advantage of the underlying competitive advantage of a country (Wall, 1976:479).

LDCs mostly export raw materials to the developed world and import high value-added goods. This indicates a demand for value-added goods and the existence of potential for local firms to add value to primary resources themselves. EPZs contribute to the development of industrial districts and clusters yielding advantages of scope and agglomeration. Agglomeration makes the existence of shared institutions, support services, financial support, training and research cost efficient yielding advantages to all firms located in a particular EPZ (Dippenaar, 2001:79). Firms in LDCs can not only rely on their own inherent strengths to survive, but need to co-operate with clients, suppliers and competitors to develop collective strengths and resources to become globally competitive. Industrial policies of government have to promote co-operation between the different industrial role players (Hirsch & Hanival, 1998:75).

The Rybczynski Theorem (see chapter 2) implies that when an EPZ is capital intensive the removal of labour from the local economy will increase production of the protected area and reduce welfare. The assumption made here is that the welfare effect of a zone is dependent on the factor intensity of the protected sector in the local economy. If the EPZ is labour intensive, welfare will increase as the output of the protected area declines (Din, 1994:370, & Hamilton & Svensson, 1992:63).

Ge (1999:3 & 20) found that to maximise the dynamic gains of EPZs, it is important to establish strong links between the EPZ and its local economy. Such linkages provide a key channel through which various technologies may be diffused from the EPZ to the rest of the local economy. Deliberate and consistent policy efforts are necessary to strengthen these linkages. These should especially include enhancing the openness of the EPZ to its' local economy and enhancing the learning capabilities of local firms, employees and entrepreneurs. This requires a wide range of further economic reforms, without which the benefits of the EPZ would be limited. Its also explains why some countries achieved more success with their EPZs than others, especially in the achievement of greater economic openness, trade and gains in productivity.

Criticism often expressed against EPZs is the exploitive low wages, long working hours and the restrictions, which most often accompany EPZs (Dippenaar, 2001:20). The amount of FDI forthcoming to develop the necessary downstream industries might be inadequate to provide efficient linkages and beneficiation of LDC's resource-based primary sectors (De Villiers, 1994:7). EPZs imply that there is being discriminated against a country's firms that lie outside the zone and relocation would cost too much (Dippenaar' 2001:112). EPZs could provide a loophole for illegal informal commodity, capital and currency markets that might not always be so easy to regulate and monitor. When EPZs are incorporated as part of an industrial development policy, these points of concern should not be taken off. The following section surveys modern research on spatial economic development.

3.5 LOCATION AND SPATIAL ECONOMIC DEVELOPMENT

3.5.1 The Von Thünen Model of Land Use

The Von Thünen theory states what achieves the highest profit will outbid all other products in the competition for location (Wheeler, 1986:318). His theory states that the higher the transport costs, the lower the amount that a tenant farmer would be willing to pay to use the land. The Von Thünen Model assumes that production (crops) differs in both its yield per unit and transportation costs. Competition causes land rents to decline from a maximum at the market (town) to zero at the outermost limit of civilisation. As industries generate higher income, it can afford higher location rent and displace agriculture away from cities. There is a trade-off between land rent and transportation cost, as transportation costs and yield per unit differ among crops. This results in a pattern of concentric rings of production around the market with perishable vegetables in the ring close to the market, followed by wheat and cattle ranches furthest away because the transport costs of the farmer is higher. In urban settings land values also increase with increasing access to important destinations such as places of shopping and work (Wheeler, 1998:328-330). Alonso (1964) applied the Von Thünen principle to his *"Mono-centric City Model"* by substituting commuters for farmers and the central business district for the town market. Unplanned competition allocates crops to land in a way that will minimise total production and transportation costs. Von Thünen's market forces and patterns of land use can today also be observed at the scale of a continent and the globe Fujita, Krugman and Venables (2001:15).

3.5.2 City Size and Location

An economy is an urban system of cities. Henderson's theory states that all types of cities have an optimal size, and at that optimal size each will yield the same utility, but size depends on the type of

city, or production in that city (Henderson, 1972:640). There are tension between external economies associated with geographic concentration of industry within a city and diseconomies like commuting costs. As population increases, people's utility rises, reaches a maximum and then starts declining. There is a trade-off between city size and welfare.

Cities vary in size as external economies tend to be specific to particular industries, but diseconomies depend on the overall size of a city irrespective of its industries. Diseconomies due to city size make the location of industries without mutual spill-overs in the same city senseless. At least in its export industries each city specialises in one or more industries that creates external economies. The extent of these external economies varies greatly across industries. A textile city might, for instance, include only a handful of mills, while a banking centre will have to contain most of the financial services a country can offer. This implies that the size of a city depends on its role. Relative prices adjust until the welfare of all representative residents in cities of whatever type is the same.

3.5.3 Growth Nodes and Agglomeration

Base-multiplier analysis views the export activities of a region as its economic base, where non-base activities are derived from the base and grow or shrink depending on the base's performance. Keynesian economics regards income generated in a region's export base as exogenous and that there are a multiplier effect increasing an initial injection. Pred (1966) observed that the share of income spent locally is not constant but depends on the size of the local market. He also suggested that as a region's economy grows in size, it becomes profitable to produce a wider range of goods and services, because the market becomes large enough to support an efficient scale plant. This can set in motion a cumulative process of regional growth. As a regional economy expands, income spent on non-base products increases. This enlarges the multiplier and thus gives rise to further increases in income, which will continue the process. The income spent on non-base products is an increasing function of the previous period's income, which provides dynamics to the system.

Although there are many points of critique against the base-multiplier approach it provides the following insights that are still important:

- The interaction between economies of scale and endogenous market size can lead to a cumulative process of agglomeration.
- Both static equilibria and dynamics are important.
- Scale economies and market size interact in the dynamics of economies and cause the possibility of discontinuous change. A cumulative process begins when the underlying parameters reach a critical value; and

- The critical value for change in one direction usually differs from the critical value in another direction.

When an agglomeration is established, it is able to survive even under conditions that would not have caused them to develop in the first place (Fujita et. al, 2001:32).

In market potential analysis it is assumed that producers will prefer sites with good access to customers, ceteris paribus. The market potential function is a weighted sum of the purchasing power of the sites, where the weights are a declining function of distance. The market potential has been used to explain manufacturing location in the past. Heavily industrialised regions are generally locations with exceptionally high market potential. Concentration of production is self-reinforcing. Market potential analysis provides a way to handle continuous space in stead of pre-specified regions.

3.5.4 Core-Periphery Model

The Core-Periphery Model consists of power relations and interconnectedness between the dominant core and the weaker, more depended periphery (Wheeler, 1998:61). Development is strongest at the core and declines towards the periphery. Much of the Core-Periphery Model survives when multiple-region and continuous space models are considered. Fujita, Krugman and Venables (2001:61) has demonstrated that the interactions among increasing returns at the level of the individual firm, transport costs, and factor mobility, can cause spatial economic structure to emerge and change. The larger the share of manufacturing in the economy, the larger the range of transport costs in which the core-periphery geography will occur and the larger would the firms' price cost mark-ups be. When manufacturers shift to a region it would also tend to decrease the price index of that region, and this will make the region more attractive place for manufacturing workers. Lower transport costs and larger markets put firms in a position to pay larger wages. These are some of the forces that may cause the emergence of agglomeration in the economy. In the first place it will cause a manufacturing core and an agricultural periphery.

A larger manufacturing work force makes a region more attractive due to forward and backward linkages. Backward because larger local markets lead to higher wages, and forward because the larger variety of locally produced goods tend to lower the price index. At a higher expenditure share of manufactured goods the range of transport costs that can sustain the core-periphery geography is increased. A large manufacturing sector can generate significant forward linkages through supply and backward linkages via demand. This will generate sufficient centripetal forces to sustain a concentrated equilibrium over a wide range of transport costs.

3.5.5 The Three-Region Model

In Fujita, Krugman and Venables's (2001:80) three-region model, equilibrium depends on transport cost. When transport costs are high manufacturing is equally divided among regions, while low transportation costs lead to concentration in one region; which region depends on the initial conditions. In the simplex, manufacturing is divided into three basins of attraction, each to one corner. At intermediate transport cost seven growth poles emerges. A central basin emerges with manufacturing being equally divided among regions, leading to three basins of manufacturing concentrated in each region. In between the four stable equilibria lie three unstable ones. The analysis could be extended to four or more regions but that makes the analysis impossible and do not add much insight.

A further extension was to assume many regions arranged in a circle equally spaced. This model is called the Racetrack Model as transportation takes place around the circumference. The assumption of a constant fraction of each manufactured goods melting away per unit distance applied and the shortest transport distance will always be followed. It was found that after a while all manufacturing becomes concentrated in two regions. Due to the assumptions it was also found that the division of manufacturing between the two regions is remarkably equal, and the two regions are equally spaced. This occurs even if labour was initially randomly divided between manufacturers and regions, and even with numerous regions and very little structure in the model.

3.5.6 Multiple Region Models

This model was then applied to many regions constituting continuous space following the work of Turing (1952) in embryonic cell division in biology. The focus was placed on the initial divergence of the economy away from the flat earth equilibrium, where a flat earth level is where all regions have the same level of industry. The rate of change of any one region's manufacturing sector depends on the distribution of manufacturing across all regions. The rate of change of manufacturing at a location also depends on the concentrations at all other locations, with the impact of manufacturing at other locations depending on the distance between those two locations.

The unrealistic assumption was then made that the actual deviation of manufacturing from its flat earth value could be described by a simple sinusoidal fluctuation and it was found that an eigenvector could describe the dynamics of the system. From the randomness a regular structure developed, and this happens where the economy has its largest eigen value frequency. The other unrealistic assumption that was made at the start of this analysis, that the pattern of real wages influence manufacturing and

that that the growth rate of a region's manufacturing is proportional to the deviation of its real wage from the average, was still held.

Transport costs usually implies "trade costs" and includes not only freight costs and insurance, but also all the costs of doing business at a distance. In the gravity models distance is always regarded as a significant determinant of trade flows, with a high elasticity of trade in respect to distance.

When two-region models are expanded to include more regions, the outcomes differ. Fujita, Krugman and Venables (2001:79-95) then abandoned the idea of regions entirely and dealt with continuous space. In continuous space it was found that when transport costs were high, many relatively small concentrations of manufacturing form; if not, the costs of supplying rural regions with manufacturers would be too expensive. Trade volumes would also decline very rapidly as a function of distance, encouraging relatively many agglomerations if the elasticity of substitution between varieties were high. When there is a high share of industry in an economy a few large agglomerations will form rather than many small ones. This happens because the forward and backward linkages created by concentrating industry are more powerful, thus the greater the share of industry in the cost of living index considering the forward linkage, and the greater the share of the population that is mobile and hence of income and demand considering backward. Much of the Core-Periphery Model survives when multiple-region and continuous space models are considered.

It seems that rural or agricultural costs are a force against agglomeration if it is included in the analysis. A higher share of mobile workers and/or low values of elasticity of substitution between varieties strengthen backward linkages and supports the core-periphery structure as it increases the range of transport cost values for which agglomeration is sustainable. A delicate balance between costs and advantages are necessary for agglomeration to appear. When manufacturing trade and transport costs are too high, core-periphery structures are not possible, while it becomes probable when this cost decreases. When manufacturing trade costs are significant, but still not too large, an interval occurs where agglomeration can be sustained. At too high trade and transport costs, agglomeration is unsustainable and core-periphery structures will not develop. If it is accepted that agricultural products differ between regions, the transportation costs of these products remain extremely small but it has a major qualitative impact on the dynamics of the economy. When agricultural trade costs are too high, agglomeration will also be impossible, and will only be sustainable in a narrow range of low trade costs. At very low trade costs for manufacturing the backward and forward linkages operating on manufacturing are extremely weak, and agricultural transport costs will outweigh it. This implies that agricultural transport costs work against agglomeration, and reducing it will allow agglomeration to take place. At high costs demand-side centrifugal forces created by immobile customers outweigh it,

causing manufacturing to spread out. Supply-side centrifugal forces created by the need to import agricultural goods may, however, outweigh it at low trade costs. A delicate balance always exits. Concentration of activity may be fostered by an initial decline in transport costs, while a further decline may dissolve that same concentration.

3.5.7 Urban Systems

Fujita, Krugman and Venables (2001:131) then studied the spatial economy of urban systems. They found that cities exist because firms locate at a hub in the market potential function created by a concentration of other firms. Cities are formed by a growing, and thereby spreading agricultural population that eventually makes it advantages for individual producers to establish new city sites, which then become locked in via the creation of new hubs. The larger the fixed costs involved in establishing new plants, the further cities will be apart, which is a measure of the importance of the economies of scale. Larger transport costs and/or the denser agricultural population the closer cities will be together. It is found that cities may form a central-place hierarchy since the difference in transport costs and scale economies among goods can lead to cities of different order. Ports and transport hubs tend to become urban centres as they can form natural hubs in market potential.

The next step is to reconcile the central city model with the Von Thünen pattern of land use, considering mono-centric geography first. Again centrifugal and centripetal forces work against each other. Agricultural workers are spread out through the region as agricultural production requires both land and labour. This creates an incentive for manufacturing to be dispersed also, to be close enough to the regional market and to have access to cheaper agricultural products. There are also backward linkages as manufacturers can gain by locating close to the market provided by other manufacturing workers, and a forward linkage in the form of manufactured goods those workers produce as intermediate inputs. This causes wages of manufacturing labour to be higher when they are closer together. The final outcome depends on the relative strengths of these forces for and against agglomeration. When manufacturers are sufficiently differentiated from one another and the size of the workforce is not too large, centripetal forces are strong enough to overshadow the centrifugal forces of dispersed farmers, causing agglomeration of all manufacturers in a single city. On the other hand, when manufacturers are close substitutes and the population is large enough so that the agricultural hinterland of the mono-centric would stretch very far from the central city, individual manufacturers would have an incentive to locate further away from the city. In such a case a mono-centric structure would not be sustainable and more cities will emerge.

The Henderson assumption (see section 3.5.3) also applies here, as there is an inverted-U relation between the size of the population and real wages. It was then found that when the population rises from a low initial level, the benefits of a larger manufacturer dominates, but if the population continues to increase the disadvantages of an increasingly distant agricultural sector will eventually win. The population size that maximises real wages is greater when manufacturers are more differentiated when the share of manufacturer preference is larger and when transport costs in both sectors are lower. Moving away from the city, the market potential first falls but may then increase again. This is due to the tension between the forward and backward linkages, which make location close to the city attractive on the one hand, but also provides an incentive to gain from the protection against competing firms due to distance.

Locations close to the city are able to pay higher wages and attract firms and workers. This will be the case when the share of expenditure on manufactured goods is small and the manufacturing employment and income concentrated in the city are small, when demand elasticity is low, and the loss of sales due to the far distance from the city is relatively low. There are therefore a critical size of population and distance. A city casts an agglomeration shadow in its local hinterland with the effect of locking in the city's location. Higher city transportation costs increase centripetal forces, while higher agricultural transportation costs obstruct the concentration of activity. These critical values of population, distance, and costs indicate the point where centrifugal forces start exceeding centripetal forces and it becomes profitable to establish manufacturing plants outside an existing city.

In these models there are always rivalry between the centrifugal and centripetal forces and the strongest force determines whether there will be agglomeration or dispersion. When the critical weight is reached, agglomeration occurs and a new city will form. This is also the case in a multiple-city landscape, where new growth poles evolve every time a critical value is reached. By integrating the models of Von Thünen and Lösch it is shown that as population grow a system of central places evolves. Fujita, Krugman and Venables's approach differs from the classical central place theory of Christaller and Lösch. In the former the market share curves are bell shaped, with no clear limit to the distance from the trading market, while in Fujita's models each central place has a clearly defined market area for its goods. This is so because each city in this model produces a group of goods that are differentiated from other cities' goods. In the classical models the same order of cities produce the same non-differentiated goods (Fujita, Krugman & Venables, 2001:166). Before the emergence of a new city in the foreland, each existing frontier city has a large uncontested market for its manufacturing commodities there, and this causes each frontier city to be very large in comparison to middle sized cities. This implies that a middle city can easily be absorbed by an adjacent frontier city.

3.5.8 Hierarchy in Urban Systems

Fujita, Krugman and Venables (2001:204) demonstrated that cities naturally tend to form a hierarchy, both in space and in industrial structure. Their model helps with the explanation of why city size differs. They had shown how hierarchy could emerge from a decentralised market process. Difference in scale economies and transport costs causes a ranking of industries in terms of the tension between the pull of dispersed consumers and that of established agglomerations. This ranking of industries in turn generates a hierarchy of city types, with higher-order cities containing a wider range of industries than lower-order. Higher-order central places also provide an order of consumption goods of its own as well as all the consumption goods of the central places of lower-order (Christaller's hierarchical principle again – see section 3.5.3). Higher-order goods have lower transport costs and smaller substitution parameters. When a higher-order city emerges, it normally does so through the upgrading of existing lower-order cities. Firms find it profitable to establish a new location for the production of higher-order goods and they tend to choose an existing lower-order city because of the backward-linkage effects of the consumers in such cities. The repetition of this process eventually causes an ordered hierarchy of cities.

Income in a city is derived from employment in all manufacturing industries and industries spin out sooner from a city if it has either a higher elasticity of substitution causing lower scale economies in equilibrium, or higher transport costs following the agricultural frontier. One industry alone cannot create sufficient forward and backward linkages to cause discontinuous behaviour however. Each frontier city is so small that it lacks enough lock-in to stay at the same location. For a spatial system to remain in stable equilibrium, each frontier city continually moves outwards until it gains a sufficient lock-in force. In this the formation of infrastructure is also a component (Fujita, Krugman & Venables, 2001:184).

Investigation of the spatial economy gives insight in the way manufacturing location and agglomeration occurs. It the sections above it were shown that Fujita, Krugman and Venables (2001) made a thorough study of the spatial economy and formulated extraordinary mathematical models. It was shown how increasing returns, transport costs and linkages can be accommodated in economic models. It was shown how national economies differ between manufacturing and agricultural belts, and then explained the spontaneous formation of highly structured urban hierarchies and the dynamics of the product cycle in international trade. First, models were developed in which regional manufacturing is immobile but agriculture not, then urban models where everywhere except that land was mobile, followed by international models where factors could not move but the role of intermediate goods could anyway create forward and backward linkages. Later they mixed these

models and assumptions to learn more about spatial interaction. They did not develop new theories but affirmed the viability of previous economic theories as well as the principles of the new economic geography that was studied in this chapter (see section 3.3 above). Many points of criticism could be sited on their work but what is important, is that their studies provide a thorough understanding of the way the spatial economy functions.

3.6 SUMMARY AND CONCLUSIONS

This chapter surveyed the factors that influence industrialists to establish plants at a particular location. The main focus was on what the so-called "new economic geography" can contribute to industrial location theory in the context of the modern generation of regional policies. The quality of labour, knowledge, social institutions and spill-overs from other firms has become fundamental in the explanation of local economic development.

Section 3.1 gave attention to traditional factors that are considered when manufacturers decide on a location to settle. These factors are also important in locational decisions, but do not enjoy the focus in the new economic geography literature. In this section attention is given to the economic environment, services and essential infrastructure provided by the authorities, government regulations, the natural environment, and factors specific to the site, the corporate objectives and proximity to headquarters, uncertainty, ambience and quality of life.

The location of a manufacturing plant is selected on the basis of the interplay of various factors. Maximum profit is, however, the first economic principle. The optimal location is the one where manufacturing and marketing efforts will result in the highest gains. The location will affect the costs at which raw material inputs are obtained, costs of production, wage rates, the power of the trade unions, personal and product transport, costs of marketing, and the amount of products demanded by the market. An optimal location has to be found between resources and markets, which will maximise competitivety and generate the highest possible profit margins.

The standard Marshallian factors of labour market pooling, supply of intermediate goods, and knowledge spill-overs, was discussed in section 3.3. In these sections attention was also given to agglomeration, transportational advantages and history. Manufacturers have to consider a combination of factors and make a thorough cost benefit analysis of all these factors before deciding on a location to establish a plant.

In less developed regions industries are either lacking or exists only at a very backward level. This is typical of most regions in Africa and especially the rural areas of South Africa. In these regions resources are not optimally utilised and development capital is scarce. This locks these regions in a low-income cycle, where low purchasing power and weak markets cannot attract industrial markets. The less developed regions lack well-developed transportation systems and other infrastructure as well as skilled workers, which discourage manufacturing development even further. These regions lack technology and its people pose only low levels of education, poor health, poor medical care, and a general low standard of living. These regions lack all the factors that the literature on new economic geography considers essential for industrial location.

It was found that once a few companies had determined a profit maximising location, it becomes more profitable for others to locate in the same area. By clustering with existing companies, the benefits of the location are amplified by the benefits that the cluster or industrial district provides to every company at that point of growth. Companies interact with one another and their decisions influence each other. The interaction of companies lead to technological and knowledge spill-overs, higher innovation and at the end, larger profits margins. At the agglomeration point of growth, manufacturers can share in the benefits of shared infrastructure, a large labour pool, especially skilled labour, as well as specialised intermediate inputs and services that will move their profits even further.

Companies should strive to be most competitive and would select a location that would contribute towards its' competitiveness. Clustering of manufacturers leads to competitive advantages as external economies of scale or location economies are achieved. Supplies of capital or service are often cheaper for example. The agglomeration process reduces costs by lowering transport costs and maximising access to supplies, and enables companies to achieve increasing returns to scale. Large urban areas attracts companies because of its infrastructure, urban amenities that includes both cultural and recreational facilities, large and diverse labour pools, and the presence of educational and research institutions.

Section 3.4 focused on spatial development patterns of a region and how it interacts with the development of manufacturing in a region. Attention was first given to the practical factors and the stages of the product cycle model. This served as an introduction to the stages that a geographical region goes through during development according to the regional cycle model. The last part of this section examines the spatial influence that new infrastructure, like a new highway, has on a region's spatial development patterns. Through its' influence on the locational decisions of firms and it correlates with the factors that the literature of new economic geography regards as important for manufacturing development. The spatial development patterns in this instance are very similar to the

previous two sub-sections and are important when a spatial development strategy has to be constructed.

The role of policies in spatial development was also considered in this section. New generation policies are required to address modern patterns in manufacturing location. Mass production fordism had reached its limits and the era of short flexible production runs in industrial districts and networks has begun. The first generation policies were designed to assist neo-classical economic development patterns. In the majority of cases the assumption was that government intervention was necessary because economic growth did not occur simultaneously in all regions. The assumption further was that inequality would eventually decline in all regions over time. Policies were aimed at smoothing the playing field for all regions in order that regions can compete fairly in the free market. Policy objectives were to ease the mobility of production factors and remove monopolistic elements. The national government was the major role player in those policies. Regulations and financial incentives influenced the location of industries. The provision of infrastructure was viewed important to overcome regional disadvantages.

By the late 1970s and 1980s the opening up national economies and the restructuring and internationalisation of production, which started to alter the regional economic landscape, led to scepticism about the effectiveness of traditional regional policy instruments and alternative regional development policies were searched for. Restructuring seriously effected growth point and core regions while new growth regions emerged elsewhere, known as industrial districts that were capable of competing internationally.

The objectives of second-generation regional development policies were to increase the development capacity of regions and to mobilise the specific resources and innovative abilities of regions in order to become internationally competitive. Instead of emphasising endogenous development, the focus moved to inter-firm co-operation, with business associations, unions and the government as a minor role player.

The last section studied modern research on spatial economics. It considered how and why spatial concentrations occur and develop. The economy is a system of cities created mainly by the actions of manufacturing industries and trade. It forms hierarchical structures and interacts with each other and the rural periphery. The same manufacturing and urban patterns of development are also applied in a global setting influencing and creating international trade and specialisation. This section surveyed and summarises spatial economic development in detail and puts the preceding sections of the chapter in perspective. Modern research does not contradict traditional theories and new economic geography,

but affirms it. It provides more insight in the role of manufacturing in the development of the spatial economic geography.

Knowledge about the effect of locational factors on the establishment of manufacturers in an area is important. It provides an understanding about the factors which could contribute towards competitiveness and the creation of employment, especially among the poorer people of the country. Once growth commences at a new location or an existing one expands, more industries need more workers, skilled and unskilled, as well as more physical inputs from various other companies. These linkages and the higher demand for more factors of production causes those suppliers to expand as well. The higher income of the newly employed workers and higher output of suppliers lead to higher demand in general in the region. The rise in private income together with the growth of industries will lead to the migration of more people and the establishment of more businesses in an area and its surroundings, increasing the agglomeration effect and the economic and spatial development of the areas around this development. Through the advantages of economic development and spatial agglomeration, more people will find employment, gain income and obtain a position where they can break out of the poverty trap and start enjoying the fruit of their labour.

The following chapter will study the policy framework of South Africa as it forms an important part of the country's industrial competitive platform intended to support firms and industries in becoming internationally competitive in the new global economy.

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CHAPTER 4

INDUSTRIAL COMPETITIVENESS POLICIES AND STRATEGIES IN SOUTH AFRICA

4.1. INTRODUCTION

The policy framework of the government has a major influence in the creation, state and future prospects of the competitive platform. The previous chapters considered theoretical aspects on which industrial development and policies are founded. The influence that globalisation and modern technology have on competitiveness and industrial development presents great challenges to modern policy makers. It was seen in the previous chapters that government could encourage industrial development by supplying infrastructure and other incentives to producers and related services. The institutional framework can also provide financial services, physical facilities and information on technology and markets to firms. Most important is that the policy framework will prepare firms to be competitive in the modern global economy. The policy framework should develop an industrial competitiveness platform for the country, which will provide a modern technological base with the skills to utilise it with proficiency. Policies and strategies of the government, which might have an influence on regional industrial development in South Africa, are therefore studied in this chapter.

The study commences by studying the development of industrial development policies and regional development policies in South Africa in historical context in section 4.2 and 4.3, followed by an outline of the macroeconomic context in which industrial policies operate in section 4.4. In section 4.4, the Growth, Employment and Redistribution strategy, a study of spatial development initiatives and Industrial Development Zones are discussed, followed by competition policy. In section 4.5 the key elements of the Integrated Industrial Strategy of South Africa is studied and the chapter concludes with a summary in section 4.6.

The following section gives a historical overview of industrial policy in South Africa to provide the necessary background and for the rest of this chapter.

4.2 A HISTORICAL PERSPECTIVE ON INDUSTRIAL POLICY IN SOUTH AFRICA

Import substitution characterised South Africa's industrial development policy since World War II. Striving for economic growth, this policy meant protection of industries manufacturing final goods, lower levels of protection on intermediate products, and even lower levels of protection on capital goods. Since 1950, South Africa has focused largely on import replacement as a means of stimulating economic growth. This strategy was promoted with the use of both tariff and non-tariff barriers such as import licensing and restrictions. Furthermore, the maintenance of an overvalued exchange rate resulted in a higher degree of protection for local manufacturers since imports were more expensive (IDC, 1995:5). These policies resulted in local manufacturers concentrating predominantly on satisfying the local market, with restrictions on international competition. This policy was largely based on the infant-industry argument. The Viljoen Commission (1957), supported protection, but did not address the problem where infant industries failed to become competitive, nor did it suggest a time period for protection (Holden, 1991:7). This lack of a time frame for competitiveness to be achieved has contributed significantly to the currently relatively uncompetitive manufacturing sector in South Africa (Suleman, 1998:83).

With regards to trade policy, the period between 1950 and the mid-70s highlighted the inward orientation of the South African economy. When South Africa began to move away from its protectionist stance, sanctions were instituted against South Africa. The shift towards a more open economy was given further impetus by the weak economic performance, the changing international environment, and the need for South Africa to implement the RDP and the WTO regulations.

The Reynders Commission (1972) and Van Huysteen Committee Reports have both endorsed the need to shift emphasis away from import substitution, and stressed the gains to be obtained from a more outward oriented policy (Holden, 1994:3,4). Since the Reynders Commission report (1972), the need for a shift from import substitution to export promotion has been recognised, and in light of this, export incentives were introduced in April 1972 and were given further impetus by the Van Huysteen Committee (Holden, 1994:3-5).

By the mid- 1970s the South African authorities realised that a policy aimed at export would lead towards higher economic welfare. In 1972, export incentives were expanded to include four categories (Belli, 1993:25), among which:

- A 50 per cent rebate on all import duties of intermediate inputs used in export products

- A tax concession to compensate exporters for the amount by which the value added of their export goods is falling short of that of competing foreign goods owing to the effect of tariff protection for South African industries
- *"Discretionary"* cash payments to support financing costs, electricity consumption and airfreight costs, and
- Subsidies for foreign marketing expenses through tax concessions (Suleman, 1998:85).

Trade sanctions forced South Africa to continue with a policy of import substitution. The Kleu Commission report (1983) supported the move towards export orientation but also levelled some criticisms at the policy. Since the imposition of trade sanctions against South Africa, South Africa has resorted to protection in the form of import surcharges introduced in 1985 that ranged between ten per cent and sixty per cent (IDC Database, 1997). These surcharges were particularly directed at the importation of luxury goods (Suleman, 1998:85). Although these surcharges were subsequently reduced (1990s), it stood at between five per cent and forty per cent in 1997 and contributed significantly to the relatively high level of effective protection (IDC Database, 1997).

In 1987, the Board of Trade and Industries proposed its Structural Adjustment Programme (SAP). This favoured selective export incentives. In 1988, a SAP was introduced for the clothing and textile industry (Holden, 1994:3-5). In 1989, the Department of Trade and Industry (DTI) submitted that the SAP was to be phased out due to its complexity to administer, and that a more uniform incentive programme would be more appropriate (Holden, 1994:3-5). In light of this, the General Export Incentive Scheme (GEIS) was introduced in 1990, and operated on the principle that all exports were to be rewarded in proportion to the amount of value added in South Africa in their exports (Belli, 1993:24).

From the above it may be inferred that industrial policy in South Africa, dating back to the early 1920s, has been linked to regional or spatial development patterns in South Africa. The rural-urban dichotomy in the South African economy as created by the mining-led growth of the late 19th century in particular, was enforced through the pattern and strategies of industrialisation after 1920. For instance, all the significant industrial policy actions during the 1920s were aimed at industrialisation derived from the benefits created by the mining industry, such as the establishment of Escom as a public corporation to supply electricity (particularly to the energy-intensive mining sector). The establishment of Iscor as a public corporation to meet the demand for steel emanating from the mining and related industries (such as for the construction of railways to connect mines with harbours), and the establishment of the Board of Trade and Industry to execute the government's import substitution-based industrial policy. The latter particularly focused on stimulating the local

manufacture of consumer goods, which in itself could have contributed to the location of manufacturing firms in South Africa near urban areas.

In addition to the above circumstances, from the 1940s onwards the homeland policy which distorted locational decisions of firms, contributed to the skewed pattern of regional industrial development evident in South Africa today (IDC, 1995:3). In addition, the maintenance of negative real interest rates for long periods in the past and incentives such as accelerated depreciation allowances encouraged capital intensity in manufacturing. Since returns on capital accumulation are higher where the proportion of skilled labour is higher, the increasing capital intensity of South Africa's manufacturing sector contributed to skewed regional industrial development.

The South African government reviewed its system of protection with a view to a more open trade regime after 1994, following the lifting of sanctions, and South Africa's re-entry into the global market (Belli, 1993 & Suleman, 1998:86-88). This resulted in South Africa becoming a signatory to the General Agreement on Tariffs and Trade (GATT) in 1994.

The IDC (1990) recommended that the GEIS be reduced and ultimately phased out, and further noted that the GEIS was expensive in that it drew on limited government funds in an undiscriminating way, and would be inconsistent with GATT stipulations. This recommendation has been heeded by national government, and GEIS was phased out completely by the end of 1997.

As a member of the WTO, South Africa is required to reform its protective system and reduce its level of protection by at least one third over a five-year period to at least the bound level of duty from the time of the Marrakesh Agreement (January 1995). South Africa's industrial offer to the GATT consisted of the following:

- Over 10 000 tariff lines will be rationalised into between 5000 and 6000 tariff lines by the end of the five year adjustment period
- GATT would bind approximately 98% of all tariff lines. This means that these tariffs cannot be raised without seeking permission from the WTO, and that if it does give such permission, it will extract a price in the form of equivalent tariff liberalisation
- All remaining quantitative controls and formula duties will be replaced with *ad valorem* duties
- The current differentiated rates of duty will be standardised into six levels: 0%, 5%, 10%, 15%, 20% and 30%
- Generally, raw materials and capital goods will have tariffs between 0% and 10%, intermediate products and components will have tariffs varying between 10% and 15%, whilst consumer goods will have tariffs of between 20% and 30%; and

- Tariff sub-headings covering products that are not manufactured in the Customs Union should be duty-free (where the South African Customs Union comprises of South Africa, Botswana, Lesotho, Namibia and Swaziland). Exceptions are where a suitable substitute is manufactured and the relevant rate of duty is justified for the sake of protecting and fostering the industry in question; or if the relevant rate of duty is justified for the sake of the simplification of the administration of the Customs Tariff (IDC, 1996:60-61).

Some exceptions to the above are:

- Clothing and textiles have to comply with the WTO programme and not over the normal five-year period, and the tariffs applicable have to come down to a maximum of 45% instead of 30%; and
- In the case of the motor vehicle industry, manufacturers have a minimum of eight years to adjust, with a maximum tariff of 40% and not 30%.

South Africa's bound average import weighted (1995) rate of import duty for industrial products was set at 19 per cent, but the average duty was already at fifteen per cent in 1994 and will decline to a level of around seven per cent by the year 2002 (IDC, 1996:61).

From the above discussion it can be concluded that the emphasis of policy since 1994 has shifted away from inward industrialisation towards the promotion of exports. This policy has in recent times been intensified due to:

- Weak economic performance of the South African economy in the last decade which resulted in low economic growth; low levels of productivity; and high unemployment levels
- The new policy framework as outlined in the Reconstruction and Development Programme (RDP) which focuses on employment creation; increased levels of investment; improved trade performance; and enhanced productivity
- South Africa becoming a signatory of the GATT and now a member of WTO, which resulted in lowering of import tariffs and restrictions; trade regulations; and phasing-out of non-tariff-barriers (NTBs) and trade related investment measures (TRIMS) and
- Changes in the international environment wherein countries are becoming globally integrated; major trade blocs are being formed; international competition is intensifying; and international trade patterns are shifting away from commodities to higher value added goods.

In addition to the above, economy-wide changes in trade and industrial incentives, the Regional Industrial Development Programme (RIDP) was re-evaluated, and has been replaced by the Manufacturing Development Programme (MDP) with tax holidays and an accelerated depreciation

program. Tax holidays are available as of 1 October 1996 (DTI, 1997a:12). This applies to the following:

- New manufacturing establishments with assets in excess of R3 million to qualify for tax holidays of two years each, for each of the following three criteria:
- Manufacturing to be undertaken in a qualifying industry
- Location within a designated area; and
- Labour remuneration to be 55 per cent or more of value added.

In awarding a tax holiday, consideration will also be given to the financial viability of the application; the impact on national competitiveness; utilisation of resources; use of term import credits, commitment to training; and environmental issues.

The tax holiday period, commences for two, four or six consecutive years (depending on meeting the relevant criteria) as from the first year in which the firm becomes liable for taxes; once a tax holiday has been granted to a firm, the project will have a ten year period in which to benefit from the incentives. After ten years have expired, benefits will cease, whether the firms have fully benefited from them, or not; and a foreign investment grant may be extended to overseas companies investing in new plant and machinery to establish a new project in South Africa. This MDP will be open for applications for a period of three years (DTI,1997a:12).

4.3 A HISTORICAL OUTLINE OF REGIONAL INDUSTRIAL POLICY IN SOUTH AFRICA

Regional industrial policy officially started with the decentralisation policy in 1960, which provided for industrial development in or near the so-called independent homelands and self-governing territories. This policy was replaced in 1982 by the Regional Industrial Development Policy (RIDP), which aimed at the creation of growth centres within development regions. In 1991 a *"new RIDP"* was accepted which shifted the emphasis from the promotion of artificial industrial development of locations with limited potential, to an approach where natural potential and market forces predominated. With that policy, pure economic criteria were accepted as the norm instead of political idealism. This paved the way for the authority to except new policies aimed at real economic development of the people and the RDP and GEAR- strategies could continue on that path as a natural development.

The regional development policy before the acceptance of the 1982 RIDP, focused on industrial development in or near the former black homelands and restricted development of metropolitan areas

and urbanisation. This implied that jobs were taken to the workers, rather than having the workers migrates towards jobs (Holden, 1990: 226). In order to increase the income earning capacity of the homeland residents and advance the socio- political objectives, incentives like special tax and interest rates were introduced to encourage industrial location at growth points in or near the black areas (Bos, 1987: 235-244).

The 1982 RDIP- policy covered all sectors, but emphasised industrial development. Measures to promote industrial development took the form of financial incentives (Le Roux, 1996:3). The incentive scheme, designed to reward industrialists for creating employment in the homelands and development regions, consisted of a set of short-term and long-term incentives (Panel of Experts, 1989:12-14).

The main short term incentives to promote regional industrial development were:

- A labour subsidy, consisting of non-taxable cash grants payable over seven years. Incentives per employee were calculated as a percentage of the average wage per employee, and the rate of subsidisation varied between 80 and 95 per cent
- An interest and rental subsidy calculated as a percentage – 100 per cent on land and buildings and 50 per cent on the cost of plant and equipment – of implicit interest, payable at the predetermined market-related interest rates. Rental subsidies ranged from 20 to 80 per cent.
- A reimbursement of up to R500 000 for relocation costs from abroad, plus an additional 20 per cent for unseen expenses; and
- In 1985 a productivity encouragement scheme was introduced, which paid consultation fees in full.

Long-term incentives of the 1982 RIDP were:

- A housing subsidy, paying rates of up to 60 per cent
- Cash grants for training, calculated at 75 per cent of company tax, multiplied by the training cost
- Electricity was initially subsidised in such a way that tariffs were equalised at all development points.
- Transport rebates ranging from 40 to 60 per cent on all outgoing goods; and
- Tender preference of up to ten per cent on all tenders to government departments, certain parastatals and local authorities.

Although much was spent on incentives, the strategy did not achieve sustainable development and job creation in the decentralised areas. It also could not stop migration towards the urban and metropolitan areas (Le Roux, 1996: 2).

In 1982 a Regional Industrial Development Policy was accepted that would consider economic considerations more (Bos, 1987: 304). It was realised that the advancement of private initiative would lead to higher possible economic development. This led to the emphasis of industrial development nodes, which received priority, and the provision of new industrial infrastructure and other incentives; while other sectors and strategies were neglected (Panel of Experts, 1989: 92-100). This meant that the comparative advantage of the different regions and other sectors, which could have used local resources better and developed the areas in those ways, were neglected (Le Roux, 1996: 7).

The programme was also criticised because of its inability to create employment and sustained economic growth, and it was not cost effective (Lichthelm & Wilsenach, 1993: 364). A major shortcoming of growth centre approach was that it did not provide specific criteria to determine the location of potential growth centres; what its size should be and what kind of investment was necessary. In the absence thereof the selection of growth nodes was left to the political process and pressures of specific interest groups. More than 50 growth nodes were established, many of them incorrectly in terms of their spatial location in relation to comparative cost benefits, so that there was a lack of self sustaining industrial development.

In South Africa, like in most other countries, "Growth pole" policies that attempted the development of economies through large infrastructure projects and the attraction of large facilities to peripheral locations with financial incentives met with only limited success. Many areas found it difficult or impossible to attract such facilities; in most instances the firms that were attracted were not integrated into the local economy and relocation of facilities based on financial incentives was often not permanent (Unido, 2000b:12).

Structural problems led to the acceptance of a new RDIP in 1991, with the aim of regional industrial development on pure economic principles. The goal of the new RIDP was "the achievement of concentrated, self-sustaining industrial development at locations with a natural potential for industrial development. This signified a policy of promoting development in future on the basis of regional resource endowment and comparative advantage instead of artificially subsidising development at locations where population was concentrated for "historical reasons" (Lichthelm & Wilsenach, 1993: 366). This policy also encouraged a more natural migration of labour based on the potential of the various regions (SA, 1991: 88). The emphasis was now on national economic development, with an

emphasis on sectoral growth. In future, job opportunities would no longer be taken to the people, but economic development would be encouraged where comparative potential existed, leading to an increase in labour demand were the economic activity was.

The principles of the new RDIP were:

- The provision of regional development in a way that will contribute to the improvement of the performance of the South African economy, with the emphasis on the development of the less developed areas;
- Development of an integrated South African spatial economy made up of a number of broadly defined development regions
- A market-orientated development approach
- A free flow of the factors of production
- A multi- sectoral development approach backed up by the regional development strategies and based on comparative cost advantages; and
- A market- orientated profit/ output- based incentive scheme (Le Roux, 1996: 8).

This policy also aimed at neutralising the bias that existed against metropolitan areas. This bias was intended to curb urbanisation and assist the homeland policy. The new programme was especially focused on Durban and Gauteng, with the ultimate aim to encourage all regions to develop to their full potential. Incentives to encourage investment now also included metropolitan areas.

This policy could provide a boost to the relatively established coastal and inland rural regions excluded by previous policies, and which offer some comparative advantages for investors. The new programme moved away from a system in which entrepreneurs were compensated for establishment disadvantages, towards incentives based on the economic and financial performance of the enterprise. It was aimed at the exploitation of natural established advantages, and led industrialists to make investment decisions on pure economic grounds, with the aim of self- sustaining economic growth (Le Roux, 1996: 11). The new RIDP together with the National Regional Development Policy aimed at the development of all sectors and regions.

The 1991 RIDP's incentives were directed towards fixed investment in specific target areas, with special arrangements for foreign investors. Only new companies qualified for incentives, which included a tax-free establishment allowance in cash payable over two years, based on an investment of up to R15 million subject to a minimum entrance requirement of 35 per cent owner's equity in order to qualify for concessions. Performance linked allowances for tax-free rebates based on profits for the first three years of operation. Investment projects financed from abroad and based on new technology,

either for import substitution or exports, could apply for a relocation grant of up to R1 million per project (Drewes, 1995:248). These grants included projects located in the Gauteng and Durban/Pinetown areas (Le Roux, 1996:9).

The underlining principle in the determination of the incentives was that it word only be awarded in the short term. Transfers would be available for only two years, after which the level of the incentive will be determined by performance. The amount of incentives was based on capital, which means that industrialists should take establishment risk into account (SA, 1991:72). Performance was not measured only by profits, but good asset management was rewarded, while low profits and/or poor asset management reduced performance (Drewes, 1995: 249). All existing incentives, such as the interest and rental concessions and labour subsidies, was phased out and would no longer form part of the 1991 incentive scheme (Le Roux, 1996:9 & 10).

It was alleged that small manufacturers could not take full advantage of the programme, and this lead to the acceptation of a Simplified RIDP (the SRIDP) in 1993. The SRIDP granted tax-free allowances to smaller establishments over two years worth 10.5 per cent of assets up to a maximum of R2.5 million, as well as a three year tax-free profit/output incentive worth 25 per cent of before tax profit and a foreign relocation allowance (Hirsch & Hanival, 1998:24). The Small and Medium-sized Manufacturing Development Programme (SMMDP) replaced the SRIDP in 1996 – (see the Chapter 4 section 4.3).

This policy was seen as politically correct with the result that locational guidance was left to market forces (Drewes, 1995:256). With a cost effective, performance linked multi- sectoral incentive scheme and the free mobility of the factors of production, especially labour; the path was now set for sound economic growth and development in South Africa.

When the Reconstruction and Development Programme (RDP) became official governmental policy in 1994, the road was already paved by the last RIDP. Implementation of the RDP was guaranteed to succeed because the new RIDP and SRIDP have already accepted the free mobilisation of production factors, especially the migration of people, and economic potential and competitive principles (Kleynhans, Naudé & Van der Merwe, 2003:4). The next step was the introduction of a policy that sincerely set the economic development of the people as its main objective. Moving to the RDP, and thereafter GEAR, SDI and Local Economic Development (LED) strategies seemed like a natural evolutionary process. The RDP policy pronounce its central goal as

> *"to create a strong, dynamic and balanced economy which will:"* (among others) *"... address economic imbalances and uneven development within and between South Africa's regions"* (ANC, 1994:79).

This indicated that the new policy also had a spatial dimension.

With nine provinces, regional development was the logical way towards this development objective. To supplement the long-term development objectives of the RDP, the Growth, Employment and Redistribution Strategy (GEAR) was accepted as an explicit short-term strategy. The GEAR strategy aims towards *"transformation towards a competitive outward oriented economy"*, but also has a spatial development dimension. GEAR states that:

> *"The expansion envisaged in the ... (macro-economic and employment) aggregates is substantial and entails a major transformation in the environment and behaviour of both the private and public sectors. This include ... new sectoral and* ***regional emphasis in industrial and infrastructural development****"*
>
> And: *"the core elements of the integrated package ... an expansionary public infrastructure investment programme to provide for more adequate and efficient economic infrastructure services in support of* ***industrial and regional development*** *to address major backlogs in the provision of municipal and rural services"* (IDC, 1998d:10).

GEAR accept the necessity of a free market supply side approach in order to prove job creation and productivity, and that any demand side stimulation should take into consideration financial calculations and the government's debt position (Naudé, 1997a: 71).

In 1996 the Department of Transport in collaboration with the Department of Trade and Industry accepted the Spatial Development Initiative. Development regions, development axes and projects are identified on the basis of their inherent unutilised economic potential, with the aim to create sustainable job opportunities in those areas, by identifying and facilitating new investment. SDIs are part of the GEAR strategy, and therefore fit into a broader macro level strategy of simultaneously growing the economy, stabilising conditions for sustained growth, and opening up economic opportunities and employment prospects for previously disadvantaged sectors of the society (DoT, 1997: 60).

South Africa's National Departments of Transport and Trade and Industry, first used the term Spatial Development Initiative (SDI), in reference to a number of urban and rural economic development initiatives aimed at achieving greater spatial equality in South Africa. The main objectives of the SDIs are to create sustainable jobs in certain identified areas, by identifying and facilitating new investment. The primary role of government is to provide physical infrastructure (e.g. a road) and to ensure co-ordinated actions by all levels of government in order to remove any obstacles to private sector investment in the region. In 2000 the responsibility of SDIs were transferred to the provincial governments.

The objectives of the RDP and GEAR is the transformation of the South African economy to a sustainable, fast growing, internationally competitive, labour absorbing, export orientated economy. To achieve this, authority developed an industrial policy, which supports local manufacturing (DTI, 1998:1). Industrial policy, at the start of the twenty-first century, focuses on the development of internationally competitive clusters, with the accent on employment creation. This implies a movement away from demand side interventions, towards supply side support criteria, which are developed to reduce unit costs and accelerated advancement in value added, as foreseen by the GEAR strategy.

Before the 1990s regional economic development policies centred on import replacement policies focusing on the domestic market, which were often politically biased regional policies. Regions close to markets, or close to an abundant labour supply, were stimulated, while competitiveness issues were disregarded. The focus was mainly on industrial activities. Capital accumulation growth models were implemented that emphasised capital investment as a source of growth. This led to the development of capital-intensive industrialisation. Growth centres and industrial decentralisation and deconcentration were created to limit economic growth at core areas. In the implementation of this policy the authorities utilised a top-down institutional approach.

International trends led to a paradigm shift in regional development policy during the 1990s. The world experienced a Neo-classical counter revolution in the decade preceding it and the international paradigm shift towards economic liberalisation and a realisation that freedom in economic exchange and the free movement of production factors will lead to higher economic growth, development and prosperity to all. This also led to a change in regional development policies in the world (Stern, 1991:250).

In the mid- 1990s globalisation forced the focus towards export leaded growth, the position of production and manufacturing on the international value added chain, and the utilisation of comparative advantage factors. Endogenous growth models were accepted that emphasised research and development, knowledge spill-overs, information services, positive externalities and the development of skills. Labour intensive high value added production technologies are implemented. Economically motivated policies are accepted, which take cognisance of the current development structures and the current level of clustering. The policies take an integrated regional approach with the emphasis on the spatial development of corridors, and local economic development, which include secondary cities and metropolises. The approach is multi-sectoral encompassing industrial clusters, agro, service and tourism and tourism activities. Instead of a top-down institutional approach of the past, a multi-tier institutional approach is followed (Coetzee, 1998:4). This led the way towards external

trade promotion, Spatial Development Initiatives (SDI), Industrial Development Zones (IDZ) and Local Economic Development (LED) development policies.

4.4 MACROECONOMIC CONTEXT FOR INDUSTRIAL DEVELOPMENT

4.4.1 Introduction

The macroeconomic policy and strategies of government should support the objectives of industrial policy. Relatively stable macroeconomic conditions have proved to be a prerequisite for sustained growth and development. For this reason it is called *"macro-level drivers"*. Macroeconomic imbalances can have a negative impact on the competitiveness of a country's industries and the development potential of its economy (Enright, 2000:8). Governmental policies operating at the national level are critical to an economy's competitiveness and development potential. It is important that fiscal and monetary policies support, and not constrain, export-led manufacturing growth, employment and the redistribution objectives of industrial policy.

In June 1996 government announced the Growth, Employment and Redistribution macroeconomic strategy (GEAR). The strategy aims partly to overcome some of the difficulties of its long-term development strategy, the Reconstruction and Development Programme (RDP). GEAR spells out the economic route the government is following to achieve its objectives.

It shows in detail what macroeconomic targets are set, and how these are to be achieved through fiscal, monetary and industrial policy. The GEAR strategy accepts the necessity of a supply-side approach to improve job creation and productivity, and accepts that any demand-side stimulation should keep cognisance of financial constraints and the debt position of the government.

The central objective of GEAR is the improvement of South Africa's economic growth rate. Within the present state of the macroeconomy there is reasonable consensus that South Africa's maximum medium to long-term economic growth rate should be about three per cent per year. GEAR proposed a supply-side strategy to improve economic growth to 6.1 per cent in 2000, and to create about 400 000 job opportunities per year by 2000.

Since the ANC government took office in 1994, fiscal policy has focused on the reduction of the budget deficit and the level of government dissaving; avoiding permanent increases in the overall tax burden; reducing government consumption expenditure relative to GDP and strengthening the general government's contribution to gross domestic fixed investment. Major progress has been made in bringing the fiscal deficit under control. This was concurrent with an improvement in the economy's

performance. Industrial growth has picked up, as has real fixed investment. Improved discipline in fiscal policy has contributed to greater financial stability and lower inflation. It also enhanced local and international business confidence, contributing to capital inflows and investment (Hirsch & Hanival, 1998:6, see also chapter 2).

This stance set out above has been criticised by alternate schools of thought, as most prominently contained in COSATU's policy proposals. This school of thought, often referred to as the structuralist school, focuses on the importance of public investment. In the case of COSATU's policy proposals, the focus is chiefly in the area of spending on social infrastructure. The chief drive of this school of thought is the crowding-in of private investment. It is argued that government spending will be complimentary to private investment in that it creates a direct increase in the demand for goods and services in the economy. Furthermore, public infrastructure investment such as providing electricity to areas not previously covered, will have the direct effect of creating new demand in certain markets, for example, demand for electrical goods. On the supply-side, private investment increases in response to greater consumer demand through the accelerator effect. Lastly, capacity utilisation improves, leading to greater productivity and self-sustaining economic-growth (Hirsch & Hanival, 1998:2 *app.*).

The emphasis of South Africa's economic policy lies with microeconomic, supply-side, interventions designed to improve the productivity of industry, thus allowing for greater competitiveness and growth. Present industrial growth does not fully satisfy the targets laid out in either GEAR or the DTI's industrial policy framework (Hirsch & Hanival, 1998:4). It is, however, sustained that the policies are appropriate and growth will follow in time. The three-year Medium Term Expenditure Framework (MTEF), announced in March 1998, reveals a tendency towards increased social investment in the medium term, which is expected to be supportive of industrial growth. Many infrastructure projects are to be undertaken in partnership with the private sector and this will enhance industrial growth. The government has prioritised investment in physical infrastructure, particularly that related to transport, water and public buildings, such as hospitals and prisons. The government has recommitted itself to delivery through Private Public Sector Partnerships (PPPs) both to conform to fiscal constraints and to crowd-in private investment. Social investment is also not confined to physical infrastructure; government expenditure on human capital is also to be increased, notably through a larger contribution to skills development and the creation of the Umsobomvu Fund to tackle job creation among others (DTI, 1998:6). Other measures that demonstrate the government's commitment are the crowding-in of private investment through selective interventions.

The consistent application of monetary policy and the maintenance of positive real interest rates over the past few years have not only brought inflation down to single-digit levels, but have also reduced the volatility of a number of financial variables including interest rates. This assists in facilitating business planning and reduces the intensity of cyclical movements in the economy (Hirsch & Hanival, 1998:11).

As success against inflation is being achieved, there is pressure to decrease interest rates, providing a boost to industry in times of low demand. This would represent a policy shift from price stability to demand support. The South African economy has, however, a dual nature. Despite low inflation figures, credit and money supply growth has remained in double figures since 1994, even with high interest rates. Late 1997 saw a marked decrease in credit extension to the private sector (the main culprit behind high money supply growth) contributing to expectations of lower interest rates in the future. The authorities believe that the climate is ripe for lower real interest rates to foster industrial support (DTI, 1998:13).

4.4.2 GEAR and Industrial Development

Implications of the GEAR strategy for trade and industrial policies are that there will be compensation for tariff reductions. Trade and industrial policies will seek to enhance the competitive capacity and employment absorption of manufacturing alongside continued promotion of tourism and export sector and appropriate growth-oriented policies in other sectors (North West Provincial Government, 2001b:7-9).

Industrial support measures set by GEAR are:

- Industrial innovation support programmes will be enhanced.
- Programmes to promote productivity
- Stimulate competitive and labour absorbing industrial development
- Review of competition policy
- Improve the access of South African firms to foreign markets
- Reform of the system of industrial finance

The promotion of small, medium and micro enterprises (SMMEs) is a key element in the Government's strategy for employment creation and income generation. Various programmes and institutions have been established to give effect to the strategy, including the:

- Small Business Centre attached to the Department of Trade and Industry

- Ntsika Enterprise Promotion Agency to provide non-financial assistance
- Khula Enterprise Finance Limited for wholesale loans
- Khula Credit Guarantee Limited for loan guarantees
- A pre-shipment export finance guarantee facility to expand access to working capital; and
- The Competitiveness Fund for consultancy advice on technology and marketing. (North West Provincial Government, 2001b:10).

In terms of industrial policy, the GEAR strategy is envisaged to establish a stable framework for expansion with non-gold exports rising to about ten pet cent annually over the projected period. This expansion will be supported by the devaluation of the Rand, which improves the international price competitiveness of South African products. With regard to industrial policy instruments, the emphasis of GEAR is on supply side measures, with technological innovation, training, productivity enhancement and a ten-year tax holiday available for qualifying manufacturing concerns. These supply side measures will lower production costs and increase FDI flows (Gauteng, 1997:5-8 & Suleman, 1998:89).

The supply-side measures and free market orientation of GEAR gives a detailed outline of the development road forward and provides opportunities for regional manufacturing industries to develop. The spatial impact of GEAR was discussed in section 6.2.3 and the emphasis that GEAR places on *"industrial and regional development"* was highlighted. The Spatial Development Initiative (SDI) Strategy is one of the strategies of government that are intended to focus specifically on regional development. The following section discusses the SDI strategy.

4.4.3 The Spatial Development Initiatives and Industrial Development Zones

SDIs are targeted interventions by central government to unlock economic potential and facilitate new investment and job creation in a localised area or region (Jourdan, 1998:717). Subsequently SDIs became the responsibility of the various provinces, and provincial governments are committed to make it a success (Morule, 2001:12, Kuskus, 2003:6 & Modiselle, 2001:6). (See also pages 191 & 192).

SDIs aim at creating growth and sustainable economic and regional development in areas of under-utilised or inherent economic potential by:

- Crowding in private sector investment through public sector interventions, including state and parastatal financial support for infrastructural projects and 'anchor projects', and institutionalising such arrangements via the formation of public-private partnerships

- The establishment of industrial development zones (IDZs), in SDI areas, to provide state-of-the-art locations for ancillary industrial investment
- The facilitation of inward investment through teams of officials attached and answerable to central and provincial government, and which are charged with identifying investment opportunities in the SDIs and linking these to potential investors at investor conferences (Lewis, 1998:728).

The SDI programme encourages Black Economic Empowerment. Investors are urged to enter into joint ventures with local small, micro and medium sized businesses, and local businesses are encouraged to use the programme to network with potential foreign or non-local investors. Any infrastructure concessions made by government have black economic empowerment clauses built into contracts to ensure that local and small businesses derive substantial benefit from the project (Jourdan, 1998:719).

The main instruments available to the authority are the removal of bottlenecks to investment, which are mainly the provision and maintenance of infrastructure, and the identification of strategic investment opportunities in the SDI area. These strategic investments are often critical to strengthening the performance of the key clusters in the local economy, either in the tourism or industrial sectors, and take the form of "anchor projects". An anchor project, by its nature, results in a sudden large injection of resources into a region. Anchor projects (or so called "construction booms") serve as magnets to additional downstream or related investments, thereby expanding the size and scope of the sector in the SDI area.

The SDI programme connects with a strong current in industrial policy that increasingly views sub-national units as key sites for developmental intervention and the provision of reliable economic infrastructure, a core feature of SDIs, as one of a small number of public sector functions. From this perspective then, the SDI programme and, to a lesser extent, the other regionally defined national measures can be viewed as part of the parcel of measures designed to enhance industrial performance. Although SDIs emanate from national government, their intended effect is to strengthen selected sub-national regions, and locale within these, as sites of industrial development (Lewis, 1998:725).

The criteria in the designation of SDIs are:

- Broad regional *redistributive* concerns predominate in those criteria that insist that SDI designation will be reserved for areas that have been demonstrably disadvantaged in the past.
- The inherent *economic potential* for sustained investment in industry, tourism or agro-processing as a key criterion for commanding SDI-linked resources. It must be demonstrated

that the region has existing, inherent, under-utilised potential that will be animated by the injection of SDI measures and resources.

SDIs are designed to support the focus of the government's industrial policy on export growth, to underpin the industrialisation of Southern African and to promote output and employment growth.

Another prominent intervention by the government as part of the SDI programme is contained in the concept of industrial development zones. IDZs are dedicated industrial estates adjacent to specified seaports and airports, and comprise an infrastructural component, as well as regulatory and other institutional interventions.

It is contemplated that the locational advantages of an IDZ resides principally in the quality of its physical, transport and communications infrastructure, in the services of a dedicated, investor-friendly IDZ management, and to certain trade related, customs and excise, advantages (Lewis, 1998:728-732).

Policy instruments of the SDI strategy, directed at crowding in private sector investment, are:

- Financial contribution from the public sector and state-owned enterprises towards installing and upgrading physical infrastructure and, generally through the IDC, towards facilitating key anchor investments,
- Regulatory and supply-side interventions to support the establishment of IDZs in specified SDIs, and
- A dedicated staff attached and answerable to central government that is principally charged with identifying investment opportunities in the SDIs and introducing these to potential investors.

The emphasis in regional industrial policy interventions is on industrial investment to create industrial job opportunities. This is due to the uneven spread of industrial development across the regions of South Africa, and a close correlation between the regional distribution of industrial, and especially manufacturing, activity and interregional disparities in wealth and income.

Initially the focus of the SDI programme was to stimulate industrial development through greater export-led development and growth. The policy instruments used to achieve this was physical infrastructure in roads, the provision of supply side incentives, and the stimulation of regional economic integration as in case of the Maputo Development Corridor. More, however, the South African Department of Trade and Industry indicated that the focus of the SDI programme has

broadened to "unlocking the inherent unutilised and under-utilised economic development potential of certain specific spatial locations in South Africa" (DTI, 1997:1).

The development of SDIs will potentially influence all aspects of community life in the less developed regions. It will lead to structural changes in the formal and informal commercial and industrial sectors, as well as social structural change of the advanced and disadvantaged sectors of the economic community. The process will involve the urban and rural structure. It will entail industrial and commercial development; housing schemes, provide health and education facilities, reorganisation of administrative bodies as well as the establishment of regional public services.

IDZs provide a further mechanism to facilitate investment in complex manufacturing. They are designed to attract FDI for export oriented manufacturing production and it is located within designated SDI regions so as to maximise the natural linkage between these two programmes.

IDZs are based on industrial concentration, which is becoming increasingly important in the global economic environment, and attracts manufacturing foreign direct investment without offering foreign investors further incentives. Various incentives, schemes and programmes exist which would assist and promote investment in SDIs and IDZs. There are, for instance, employment schemes, the multi-shift scheme, normal finance, venture capital scheme, accelerated depreciation scheme, an emerging entrepreneur scheme, capacity building support, business loans for retail financial intermediaries, the Manufacturing Development Programme (MDP), the Small and Medium Manufacturing Development Programme (SMMDP) and finance for export of capital goods and services.

4.4.4 Competition Policy

The elimination of trade and investment barriers contributes towards ensuring contestable markets. The advantages of liberalisation can be destroyed by restrictive business practices. Competition policy is introduced to reduce non-statutory barriers to entry. The concentration of many of South Africa's industrial sectors has already been identified as one of the key inhibitors to new foreign direct investment.

The importance of competitiveness for industrial development and sustainable growth is identified as a priority by the South African authorities (DTI, 2001). As globalisation and modern technology rise in importance, competition policy is becoming a priority for regional industrial development. The country's policy on competition is concerned with the issues of conduct, structure and ownership as well as industrial restructuring and development. This approach forms the pillar that will effectively support the government's microeconomic productivity measures, and macroeconomic national

economic management efforts. The competition policy framework is designed to promote downstream high value-added exports and driving competitiveness in the new global economy (Hirsch & Hanival, 1998:86).

In the modern new global economy South African manufacturers will have to shift their production towards globally competitive downstream manufacturing, both for the export and the local market. To support this process of restructuring, the Department of Trade and Industry established the Competitiveness Fund. The fund is intended to stimulate the use of foreign and domestic support services. Support services will introduce into these firms the skills, know-how, information and contacts needed to defend against import competition and to increase and expand exports. By travelling to foreign markets entrepreneurs would be able to find their firms unique niche in the international market. It can establish contacts with export outlets and with sources of inputs that could help build competitiveness (Suleman, 1998:143).

The fund also provides 50-50 cost-sharing grants to assist in the expenses of travel and buying outside expertise. Based on international experience, it is expected that 80 per cent of the grant support will go towards technology and productivity adjustments within the manufacturing plants, and about 20 per cent to marketing. The DTI has a "hands-on" approach towards firms to prepare firm-level plans aimed at enhancing competitiveness. The aim of these cost sharing and hands-on initiatives is to serve as a catalyst in demonstrating to the private sector the advantages of active seeking out external sources of information and know-how. Assistance of the Competitiveness Fund is not limited only to SMMEs, as it will yield substantial benefits for the country if medium to large companies also make serious efforts in restructuring. A cap of US$100 000 of grant support per firm is, however, set to ensure that granted funds are not disproportionaly directed towards a few large firms (Suleman, 1998:144).

In 1979 the Maintenance and Promotion of Competition Act was accepted as an improvement on Act 24 of 1955. The previous act was regarded as inefficient because it enabled intervention only after a merger or acquisition was complete. The act of 1979 was supposed to discourage business conglomeration, and counter several factors that contributed towards monopolistic structures and concentration, such as protection barriers, the accumulation of capital by mining houses and other geographical factors (Hirsch & Hanival, 1998:84). Department of Trade and Industry identified technical flaws in the Maintenance and Promotion of Competition Act of 1979 and viewed it as relatively ineffective, both on substantive and logistical grounds. To address these problems Department of Trade and Industry embarked on a three-year project-consulting venture with experts and stakeholders, to arrive at a new competition policy framework for South Africa. This effort has

culminated in a set of policy guidelines, published in November 1997, which served as a discussion document presented within the forum of Nedlac (DTI, 1998:85). As is the case with a number of other countries, the proposals would see competition policy effectively promoting concerns of industrial policy. The role of competition policy within industrial restructuring is to help local firms to participate effectively in international competition and to move up the value-added chain.

A shortcoming of the Competition Act was that it contained no provision against monopolisation per se, except in so far as conduct arising there from is not in the public's interest. Vertical integration and unjustifiable conglomerate relations could not be addressed. The act did not contain strong prohibitions of anti-competitive activity and was difficult to enforce. Contrary to the practice in most countries, it did not in fact prohibit anti-competitive conduct. The guidelines therefore stated that:

- *Horizontal concentration* had to be curbed o address the concentration of ownership
- *Verical ownership* and acquisition had to be discouraged
- *Meargers and acquisitions* that were potentially restrictive were difficult to prevent. The law should require compulsory pre-notification of mergers and acquisitions of substantial size.
- *Anti-competitive conduct* should be prohibited by law and it should be made practically enforceable (DTI, 1998:85).

To address these weaknesses in the legislation, the government proposed that South African monopoly law be directed at restrictive practices and abuse of dominance. A certain, coherent, and predictable set of principles governing competition will be developed specifying acts which are specifically prohibited. The government is also cognisant of the link between structure and conduct. While anti-competitive conduct does not necessarily flow from given structural arrangements, they do enable such inappropriate conduct to take place. Hence it was proposed that, while the monopoly law authorities will direct themselves principally at anti-competitive conduct, they would retain the power to institute or to trigger structural remedies, both pre-emptively, to prevent anti-competitive mergers and acquisitions, and with respect to compelling disinvestment or exit from particular markets. It was also proposed that a separate Securities Act be drafted, which would include aspects of the existing Companies Act, to deal solely with matters of corporate structure, including mergers and acquisitions (DTI, 1998:86).

The government's view is that monopoly laws should be affected by a competent, professional agency with powers to investigate and to respond rapidly and robustly to anti-competitive conduct. The decisions of the tribunal envisaged would be subject to judicial review, but it is the government's intention to take enforcement of competition law out of the hands of the criminal courts and to avoid the prospect of lengthy, complex and costly litigation. The possibility of politically inspired

intervention will also be removed by eliminating the powers of ministerial discretion in the enforcement of competition law and by a more precise definition of both the mandate of the policy structure and its relationship to the minister and government policy (DTI, 1998:92).

In the South African context, given national economic objectives and the DTI's strategy for industrial restructuring and driving global competitiveness, the interests of SMMEs, export sectors and certain key industries could be exempted from competition policy provisions in a considered manner. To avoid unnecessary bias, industrial support measures are aimed at the level of clusters and other collectives of firms rather than individual firm level. Market failures that compromised the country's human resource and technological capacities should also have to be addressed.

The authorities encourage foreign direct investment (FDI) as it can directly contribute to the contestability of domestic markets. This is especially so because trans-national corporations may be better able than purely domestic firms to overcome some of the cost-related barriers to entry that limits the number of firms in an industry. The markets in which the opening up to FDI is most likely to enhance contestability and inject competition are those for services. Many services cannot be traded across distances, and FDI is the only modality through which foreign providers can enter host country markets for these services. Increasing competition in the local markets for certain products and services will also force South African companies to become more competitive in international markets, thus supporting the goal of export-led manufacturing growth (Hirsch & Hanival, 1998:88).

The next section outlines the broad macroeconomic context for industrial development, considering the national strategies aimed at economic growth of the South African economy and its industries. It sets the seen and perspectives on the specific policies that contribute towards industrial development that are treated in the sections that follow.

4.5 KEY ELEMENTS OF THE INTEGRATED INDUSTRIAL STRATEGY

To achieve the policy objectives of industrial development of raising competitiveness, profits and employment, the strategy of South Africa is focused on six arenas, which DTI intends to promote:

- Technological learning
- Investment and employment
- Competition and markets
- Competitiveness and productivity
- Exports and import liberalisation, and

- SMME empowerment (DTI, 2001:34).

These arenas still build on the five key pillars of the previous policies, namely investment support, trade facilitation, technology promotion and innovation support, strategic and informational leadership, and human resources development, but now also intends to prepare South Africa to compete globally and address microeconomic deficiencies.

4.5.1 Technological Learning

Technological learning is to be promoted by the government because of the high social returns it offers and the existence of market failures that have to be addressed. It must build up missing capacities to ensure modern competitively (DTI, 2001:8). The innovation fund and the Technology Transfer Agency, as well as the PII, SPII and THRIP policies of DTI are the main instruments to promote technological learning. These policies must encourage technological transfers, R&D support, FDI promotion, and utilise licensing and industry extension services as reminiscent policies. Knowledge was always important in manufacturing. That is why industrial policies relating to innovation like THRIP and SPII was instigated to help firms acquire, exploit and create knowledge and modern technology more efficiently (DTI, 2001:29).

When the industrial revolution started in 1760, many people continued to make their merchandise the traditional way. They experienced lower profits and higher costs than their competitors and were eventually marginalised and pushed out of the market. Most African manufacturers will today still continue their traditional methods, but manufacturing based on knowledge and information technology will eventually also push them out of the market if they do not modernise their production methods. It is because of this that the South African authorities try to enhance technological learning, especially now that tariffs and trade barriers are disappearing following the GATT agreement.

The new policies of DTI are designed to enhance the ability of workers to engage effectively in knowledge-intensive activities, and the ability of firms, in both manufacturing and in the new economy sectors, to increasingly compete through effective knowledge-intensive production and utilisation. The policies seek to enhance areas and activities in manufacturing which generate higher returns, especially in the sectors of the new economy. Government policies are thus designed to provide support to all manufacturing firms and sectors in such a way that it will be able to produce efficiently and assimilate knowledge (DTI, 2001:26).

Government utilises policies, which will facilitate the more effective use of knowledge on the part of internationally, competitive raw material-intensive manufacturers. The aims are to enhance their

competitive position in existing activities further, but also encourage them to engage in activities downstream and closer to the market, which tends to be more knowledge-intensive, and that could generate higher returns, employment and value added. The policies will also similarly progressively seek to enhance industries that are not currently competitive by facilitating the more effective production and use of knowledge. The government will thus not neglect the traditional constituency of manufacturing firms (DTI, 2001:26).

The government recognises the importance of having a technology promoting policy in place in order to support economic growth, specifically driven by the export of high value-added manufacturing goods (Hirsch & Hanival, 1998:46 & DTI, 2001:8). With the changing economic global environment that demands more high value-added products, manufactured by modern technology and flexible production cycles that yield high returns and are backed by information technology, enhancement of the country's technology base is essential. (See also section 4.3 of this chapter).

Direct government support for technology development has theoretical justification in the endogenous growth theory. There is clear theoretical and empirical demonstration of the fact that, if left to the market, the level of investment in generating new advancements in technology would be less than is socially needed. For this reason, government support of scientific and technology development has been in place in advanced industrialised countries for some time. As the industrial history of the new industrialised countries has now vividly demonstrated; the lessons of endogenous growth theory can be extended. The government states that intervention in the acquisition and absorption of technology are just as important as support for the development of new technology. It is also thought that the level of investment undertaken to acquire and absorb technology from elsewhere, in the absence of government support, will be sub-optimal, thus rendering technology transfer less effective than it could be (DTI, 1998:45).

Particular attention is given to the investment in human resources and support for technological innovation. Improvement of human resources includes increasing the relevance of education and training to industrial needs, co-ordinating skills needed by industry with the design of educational curricula, increasing the emphasis on technical subjects at higher levels of education, and increasing industry involvement in training at the vocational level.

Spending on innovation both increases the firm's own knowledge base and it helps firms to develop in-house knowledge and capacity to recognise and exploit technologies produced outside of the firm. Studies have shown that the societal return to innovation expenditure substantially exceed private returns. The governments should therefore provide assistance. The White Paper on Science and

Technology sets out a framework for affecting a more integrated National System of Innovation wherein linkages between the business sector and other performers of innovation are enhanced.

A National System of Innovation (NSI) aimed at the co-ordination of the activities of the science, engineering and technology (SET) community and to promote technological innovation was established by the authorities. The NSI will oversee specific programmes aimed at supporting both large, long-term research into industrial innovation, as well as direct grants for the development of product or process innovation in SMMEs.

Programmes included in this framework, are the National Research and Technology Foresight Programme, the Innovation Fund, the Support Programme for Industrial Innovation (SPII) and the Technology and Human Resources for Industry Programme (THRIP). Other initiatives are the agency for technology transfer; Partnership for Industrial Innovation (PII) aimed at the innovation needs of large firms; Feasibility Study Support (FSS) aimed at assisting SMMEs in innovation development; and proposals for the implementation of Technology Incubators aimed at supporting entrepreneurial innovation amongst SMMEs (Hirsch & Hanival, 1998:46).

The aim of the THIRP programme is to provide the South African industry with a means to obtain specific responses to its technological needs, and to produce a flow of highly skilled researchers and technology managers who understand research, technology development, and the diffusion of technology, from both the point of view of industry and the academic sector. It provides students with industry-relevant experience and encourages co-operation between SET participants.

The SPII programme is designed to promote technology development in manufacturing industries through financial and project management support for innovation of competitive products and/or processes. It provides grants to selected technology innovations of 50 per cent of the direct pre-competitive costs involved, up to a maximum of R1.5 million per project (Suleman, 1998:145). The programme also supports SMMEs through the Feasibility Study Support Scheme (FSS) and so-called Business Incubators centres. The R1.5 million grant ceiling is, however, seen as to low to encourage large-scale innovation projects. A Partnership in Industrial Innovation scheme (PII) is being planned as an additional means to promote innovation amongst large firms (Hirsch & Hanival, 1998:54). While SMMEs create most employment, large firms are especially important for their research, development and innovative capacity (DTI, 1998:45).

Given that support for innovation is a critical component of export-led manufacturing growth, one area for increased future research will be on how innovation support can be tailored to assist greater

export success in particular (DTI, 1998:56). South African manufacturing firms are not innovation intensive. Governmental supports particular technologies and R&D thereof as it generates substantive externalities. The knowledge potential in tertiary institutions is also seen as vital to unlock; and is mainly pursued through THRIP and the Innovation Fund (DTI, 2001:30).

The CSIR forms another vital pillar in the implementation of the government's technology policy. The CSIR has strengthened its interaction with formal sector SMMEs and has piloted various initiatives, usually in partnerships with the Ntsika Enterprise Promotion Agency and the National Productivity Institute. This is to strengthen and support SMME creation, extension and leverage. These include manufacturing advisory centres (MACs), technology demonstration centres and innovation centres. It has also included 'funnel and bridge' activities such as the transfer and refurbishment of a complete relay manufacturing plant from Europe to South Africa.

The government is investigating the acquisition of technology via license agreements by local firms. The aim is to formulate policy, which will ensure reasonable royalties, less restrictions on exports and provisions, which retard the local firm's abilities to develop their own technological capabilities. The transfer of innovation capacities, the "know-why" necessary to not only operate the new technology, and eventually to modify and improve upon it, must be secured. The selling of South African technology is also enjoying attention from the authorities.

The authorities realise the importance of co-ordinating innovation promotion policies with other industrial policies such as cluster initiatives, competition policy, export promotion and investment policy (DTI, 1998:63 & 2001:14).

4.5.2 Investment and Employment

Investment and employment promotion deserves attention because of market failures, market access problems, and the externalities and learning it can lead to. Many of the incentives are discussed elsewhere in this study (see section 4.2 and 4.3 above). Investment is, for example, promoted by directed credit, subsidies and tax holidays, while the main policies and programmes are the SMEDP and SIP programmes, the SDI strategy, the Critical Infrastructure Fund, industrial participation and organisations like Trade and Investment SA (DTI, 2001:34).

Many manufacturing is integrated or have links with upstream activities, such as development and design, and downstream activities, such as marketing and sales. The promotion of such manufacturers will yield the highest economic development. The government's industrial strategy will therefore not

focus solely on production. It will seek to integrate both backward and forward linkages with production. It must develop and enhance existing capacities in knowledge-driven activities, which will also require development of leading edge logistics (DTI, 2001:25).

A sound telecommunications infrastructure is fundamental to knowledge-intensive activities and to business generally. Such a system should be a cheap, effective and technologically sophisticated telecommunications service, overseen by effective regulations (DTI, 2001:30). South Africa has an advanced fixed line system and a large and very rapidly developing mobile system. Currently however, business is not being well served by the existing structure and this deserves attention from the authorities (DTI, 2001:27).

The new industrial policies will continue the core elements of the previous policies. A wide range of supply-side policies covering all of the major areas of industrial policy will remain in place. Supply-side policies will be designed to improve the capacity of those industries that currently are internationally competitive to enhance their position. Government will continue to support and facilitate export activities. Other industries that are not currently competitive will receive support and incentives to facilitate their gaining a competitive position (DTI, 2001:25).

Because of the cumulative nature of technological change and firm level learning, specialisation is likely to be reinforced through time. The rapidly growing manufacturing sectors with those activities in manufacturing which generate higher returns and the new economy sectors are all highly knowledge-intensive. The dynamic areas of international trade are knowledge-intensive, and thses investments in knowledge activities generate very considerable positive externalities (DTI, 2001:25). As the new economy will yield higher gains, it will be in the position to attract more investment funds for development.

In developing the South African manufacturing sector into a vast growing knowledge, information and modern technologically driven economy, the county is constrained by the low quality of human resources, inadequate infrastructure and market structure especially for telecommunications. New employment opportunities generated in the new economy are likely to be preponderantly for skilled workers. Very few employment opportunities will be generated for unskilled and semi-skilled workers. Traditional manufacturing industry will not be a source of significant employment gain either. Widespread education and training are thus a basic requirement for effective integration into the knowledge society (DTI, 2001:27 & 28).

The new economy is currently causing rapid rates of employment growth in the creation of employment in the services sector. There also is a significant potential for further employment growth, especially in tourism, health services and telecommunications services. The scope of industrial policy needs to be extended to the development of these potential service areas as a priority (DTI, 2001:27).

Skills development must provide the necessary factors of production and make workers employable in the modern economy. The Department of Labour created the National Skills Strategy, the Departments of Education and Labour is leading the Integrated Human Resource Development Strategy, and the Department of Education has a National Plan for Higher Education. These strategies will enhance the country's human capital, but DTI will have to play a leading role in identifying the requisite knowledge-intensive activities and in the integration of these initiatives with other policies designed to support industrial development (DTI, 2001:29).

4.5.3 Competition and Markets

The authorities acknowledge the importance and power of market forces to ensure low prices, extend choice, innovation, and for new entry into the economic arena. However, to curb risk and ensure certainty and the public's interest the market needs to operate under a clear set of rules. Market failure must therefore be addressed and the necessary regulatory regime is provided (DTI, 2001:7).

The authorities assert that research confirms time and again that the most effective international competitors are those who are tested by competition in their domestic markets, competition must therefore be enhanced locally and internationally (DTI, 2001:8). This competitiveness should be enhanced by well-developed infrastructure, especially with regard to an efficient transport system and communications network. Complex technical regulatory functions that characterise these sectors and ensure compliance with the social objectives are to be provided by government (DTI, 2001:14).

Government believes that the operation of the invisible hand of the market, if left entirely unrestrained, favours the strong over the weak (DTI, 2001:7). Competition and markets should thus get attention from the authorities to address existing market failure, eliminate rent seeking behaviour, and to promote productivity, innovation and new entries. As innovation and productivity increase, profits and competitively also rise. To promote competition and markets the regulatory regimes must be in place and active steps taken to improve competition. The competition act will help in this regard (see *competition policy* above), as well as tribunals and commissions (DTI, 2001:34).

Globalisation causes major structural and qualitative changes in the working of the world economy and consequently in the relationships of national economies to that world economy. Information technology and economic liberalisation policies have had the effect of greatly increasing the global integration and significance of markets, and thereby increasing their impact on economies. This has major implications for the financial stability of economies, investment decisions, the location of production and economic activity and the dynamic competitiveness of manufacturing activities (DTI, 2001:2).

The authorities have an array of regulations to protect labour or environmental standards and ensure sound corporate governance. A key part of the regulatory environment of the statutory industrial policy framework is designed to secure the effective functioning of markets. The Competition Act came into effect in October 1999 to promote a competitive market structure through the regulation of mergers. It also prescribes a variety of anti-competitive horizontal and vertical agreements and other practices – particularly when perpetrated by dominant firms – designed to secure or exercise market power. The Competition Act aims to promote and maintain competition to promote the efficiency, adaptability and development of the economy, to provide consumers with competitive prices and product choices. It also aspires to promote employment and advance the social and economic welfare of South Africans. It intends to promote international competitiveness, promote the participation of small and medium-sized enterprises and promote a greater spread of ownership (DTI, 2001:8).

In deciding the effects of a merger, the competition authorities consider criteria like the sectoral or regional impact of the transaction. Consideration is also given to its impact on employment, the ability of SMMEs and firms owned by historically disadvantaged persons to compete, and on the ability of South African firms to compete in international markets. Anti-competitive practice proscribed by the act may, however, receive prior exemption if the competition authorities are satisfied that the practice in question contributes to a number of specified objectives. These include the promotion of exports and the ability of SMMEs and firms controlled by historically disadvantaged persons to become competitive (DTI, 2001:8).

A degree of continuing state involvement will always be necessary. The minimum efficient scale of operation has, in key areas like for example electricity generation and telecommunication, reduced the extent to which private capital is now able for participation. The state has to intervene as a producer or licensor of economic activity in order to overcome market failure or to secure the realisation of social objectives that are not provided by free market forces. Intervention will also be necessary where the minimum scale of production requires levels of investment greater than that to which the private sector is willing to commit, especially where natural monopolies exist (DTI, 2001:14).

4.5.4 Competitiveness and Productivity

The creation of more competitive markets is important. Competitive markets spur productivity and innovation, enabling firms to gain their required inputs at competitive prices. There is, however, some indication of domestic firms in South Africa maintaining substantial market power. This enables them to raise prices and to put up with substantial inefficiencies in production. Increasing competitive market pressure will therefore be an important complement to raising company-level efficiencies. This will be principally affected through trade liberalisation and application of the new Competition Act and through policies, which promote the creation of new businesses. Strong and knowledgeable consumers will also encourage efficient and competitive business. When consumers are better informed, businesses will be encouraged to follow good practices (DTI, 2001:31).

There are significant externalities and endogenous learning involved when competitiveness and productivity are promoted. Policies to encourage training and skill development, networking, and supply chain upgrading are indicative policies in this regard, assisted by the competitiveness fund, sector partnerships and workplace challenges (DTI, 2001:34).

Competitiveness can be increased when manufacturers have access to cheap raw material inputs, and unskilled labour, access to proprietary production technology and privileged access to markets. These traditional modes are however much less efficient today. With flexible high knowledge driven technological manufacturing cheap untrained and unskilled labour is less in demand. The nature of consumer demand is changing. Consumers demand quality, variety and customisation, which require better technology and better skilled labour. Innovation and the satisfaction of rapidly changing consumer demand increasingly drive company strategies (DTI, 2001:23). The industrial policies of government have to build upon these changes to ensure a competitive economy.

The South African economy relied to a great extent on the access and export of cheap raw materials, mineral and energy intensive products. The access of cheap raw material is declining and will not be a firm foundation for a competitive position in the future. So-called intangibles such as design, branding and marketing constitute a growing share of the value added and more profitable activities, which are increasingly being located closer to the market and away from the production and processing of raw materials (DTI, 2001:24).

In many of the most dynamic areas of manufacturing in which demand is growing most rapidly and which are generally non-material intensive, South Africa's performance is weak, such as electronics for

example. In many areas, evident weaknesses in the activities of innovation and product customisation make it difficult for producers to achieve and retain a comparative advantage. Countries that specialise in technologically progressive knowledge-intensive industries experience faster growth than those that do not. The authorities' therefore accepted policies with a new direction to create a knowledge-intensive manufacturing sector. The former inward bias will be eliminate and price distortions will be corrected to facilitate growth in sectors and activities in which South Africa has an existing comparative advantage (DTI, 2001:25).

There is a structural shift in the pattern of world trade away from commodity production and raw material intensive simple manufactured goods and towards increasingly knowledge-intensive goods and services. Traditional bases of securing a competitive advantage are declining for South African manufacturing firms; the ability to compete is increasingly turning towards the capacities to master information technology, to innovate and to address the precise needs of customers. The knowledge costs of entry are far more important than the financial costs of entry and securing a competitive position will increasingly turn to the ability of the firm to exploit all of the knowledge resources available (DTI, 2001:24).

Sharing and trading information with other firms is a major way in which firms can expand their knowledge and enhance their competitive position. Government is committed to encouraging best practice and the development of efficiency enhancing networks. The Sector Partnership Fund and the Competitiveness Fund are the most important measures to support firm networking and the diffusion of best practice (DTI, 2001:30).

4.5.5 Exports and Liberalisation of Imports

In the promotion of exports and the liberalisation of imports the composition of trade is changing and efficiency gained. Export marketing support and tariff liberalisation is of the indicative policies, while the most important policies and programmes are export guarantees for SMMEs as well as export marketing and investment assistance (DTI, 2001:34).

The rules governing international trade will receive attention from the authorities. Matters like international competition rules, international investment rules, and international labour and environmental standards deserve consideration. During future rounds of the WTO, government will attempt to bring developing countries together around a common agenda – the so-called G-South. Significant concessions should be secured from the powerful industrialised countries. A critical

objective will be to secure a substantial reduction in protective measures that shield inefficient industries in the industrialised countries and so significantly improve market access for the developing world. It is important to have a level playing field when competing internationally (DTI, 2001:15).

South Africa's industrial strategy aims to harness the complementarities that exist in the region to obtain lower production costs, promote economies of scale, and develop an integrated regional production system. This also entails closer economic integration, especially in relation to trade in the SADC Free Trade Agreement and measures to encourage South African investment in the region, but also in other areas such as infrastructure, notably the SDI programme (DTI, 2001:26).

In its' so-called "Butterfly Strategy" DTI intends to expand regional and bilateral relations. It spreads its' new "trade wings" from the body of our traditional trade with the EU and North America and establishes sufficiently diversified strategic partnerships with key countries in the global trading system. The Trade and Development Co-operation Agreement between the European Union and South Africa has historically been a major trading partner. This will ensure continued flows of investment and technology into our economy, and will secure access to an increasingly difficult market for our exporters. The Southern African Development Community FTA consolidates an economic partnership with the immediate region. These two agreements form the platform on which future global economic strategy can be based. Negotiations with Mercosur will also be launched. Bilateral agreements with other countries in the South are intended to ensure that South African manufactures in particular, expand rapidly into these markets (DTI, 2001:15).

4.5.6 SMME Empowerment

Small enterprises experience a lack of knowledge and large market failures. SMME empowerment will address externalities, social instability and equity. Directed credit and procurement policies are the most important indicative policies, while Khula and Ntsika are current DTI programmes promoting SMME development, together with government procurement preferences and the National Empowerment Fund (DTI, 2001:34).

The Black Economic Empowerment and the National Small Business Strategy take account of the specific factors that underlie the difficulties and the weaknesses that limit the competitive advantages of small enterprises and try to address those (DTI, 2001:13).

4.5.7 Implementation and Liaison

The authorities see industrial policy as a business entity. It must be geared towards the customers and provide adequate services. When demand changes, or when needs change, policies also have to change. Government has to be innovative and apply new knowledge and information technology in its formulation and application of policies (DTI, 2001:31). The new integrated industrial strategy requires inter-departmental co-operation and interplay between the public and private sectors (DTI, 2001:14). Government is committed to the strengthening and deepening of the consultative mechanisms with all industrial stakeholders. Trade unions and shop steward structures are also seen as an important part of the process. To obtain efficient formulation, implementation, monitoring and assessment of industrial policy the government see the flow of information between government and the private sector as indispensable (DTI, 2001:30).

The new focus of the DTI is more broadly than that of the manufacturing industry and emphasises "new" tools of policy, particularly in the field of regulation in order to secure output and employment objectives, which inevitably entails greater co-operation with a number of other government departments. This is especially true in relation to those departments which have formal responsibility for many of the new economy sectors, such as health and communications. It is also significant in relation to departments that are concerned with the supply of key infrastructural inputs to business – such as energy, transport and telecommunications. Enhancing the ability of firms to access, produce, and exploit knowledge efficiently will also require the co-operation of other governmental departments, like education, labour and arts, culture, science and technology (DTI, 2001:31).

4.5.8 Microeconomic Reform Strategy

By 2002 DTI stated that their macroeconomic policies and strategies are in place but growth on a microeconomic level was still limited (DTI, 2002:3). The *Integrated Industrial Strategy* of 2001 was augmented by an *Integrated Manufacturing Strategy* during 2002. Several factors influence efficient allocation, productivity and competitivity of firms. In the more developed section of the economy there are still impediment costs to competitiveness, such as tariffs charged by certain state-owned enterprises, retarding the efficiency of the supply chain for example.

On the less developed level basic infrastructure is lacking, especially roads and communication. The labour market also experiences a mismatch between demand and supply, low levels of education and skills and technological deficiency. Compared to South Africa's competitors the per capita expenditure on information technology is low, investment on research and development is inadequate and public

science and technology infrastructure is insufficient. The deficient investment in modern technology and equipment exacerbate the low levels of knowledge and training leading to lower levels of efficiency and productivity. There are also low levels of integration in manufacturing processes causing insufficient value addition (Dobson, 2002:2 & 13). The industrial development strategy of the country is therefore expanded to include a focus on microeconomic focus.

4.7 SUMMARY AND CONCLUSION

This chapter investigated the policies and strategies of the authorities, which influence, and direct the development of South Africa's industrial competitive platform. The study commenced with a historical overview of industrial policy in South Africa between 1910 and 2003, as well as the historic development of regional industrial development policy in South Africa. Then the macroeconomic context of industrial development, GEAR, spatial development, SDIs, IDZs and industrial policy were studied in section 4.4. The last section of this chapter (4.5) considered the government's industrial development policy, which includes the integrated manufacturing development policy.

Trade and industrial policies in South Africa were historically focused on self-sufficiency. The government wanted to establish its sovereignty by producing all products locally and restricting imports. The country focused on import substitution and exports were to a large extent irrelevant. By the middle of the 1970s the country realised the importance of an export led trade and industrial strategy, but this could not be put into practice as sanctions were instigated against South Africa by the international community. During 1972 export incentives were expanded, decreasing import duties, giving tax concessions to exporters, subsidising financial costs, electrical consumption and airfreight. Since then, various schemes were implemented to reduce protection and improve exports but this remained limited due to the imposed sanctions. Some of the most important schemes were the Structural Adjustment Programme that was established in 1987 that focuses on selective export incentives. In 1990 the General Export Incentive Scheme (GEIS) was introduced and operated on the principle that all exports were to be rewarded in proportion to the amount of value added in South Africa in their exports.

The industrial policy in South Africa, dating back to the early 1920s, has been linked to regional or spatial development patterns in South Africa. Focus was therefore initially on support to mining and heavy industries, such as the establishment of Iscor and Escom. The Board of Trade and Industry particularly focused on stimulating the local manufacture of consumer goods, which in itself contributed to the location of manufacturing firms in South Africa near urban areas. This trend was

however, also distorted by the homeland policy as industrial development also had to ensure economic prosperity to the self-governing territories.

In 1982 the Regional Industrial Development Policy (RIDP) was implemented, which aimed at the creation of growth centres within development regions. This was replaced by a *"new RIDP"* in 1991, which shifted the emphasis from the promotion of artificial industrial development of locations with limited potential, to an approach where natural potential and market forces predominated. With that policy, pure economic criteria were accepted as the norm instead of political idealism. This paved the way for the authority to except new policies aimed at real economic development of the people and the RDP and GEAR- strategies could continue on that path as a natural development. During 1995, Spatial Development Initiatives (SDIs) and Industrial Development Zones (IDZs) were expected to develop less developed regions in the country, create employment opportunities, and assist in the alleviation of poverty.

During the late 1980s South Africa accepted the General Agreement on Tariffs and Trade (GATT) according to which international trade protection and tariffs would gradually be phased out. This agreement was ratified with the Marrakesh Agreement in 1995 and the establishment of the World Trade Organisation shortly afterwards. This enabled South Africa to compete on international markets with fewer restrictions and enjoy export led growth. This also however, implies that South African industries would be more vulnerable to international competition in future and the industrial policies have to prepare the country to compete in the new modern environment where globalisation could either be a threat or applied as an opportunity for future development.

South Africa's *Integrated Industrial Strategy* that was accepted during 2001 took recognition of the impact that globalisation and the new economy have on the development of less developed regions and is not only intended to repair weaknesses, but also to build an economy that can reap the benefits that participation in the new economy can offer. The strategy focuses on the pillars that intend to create a regulatory framework, set the rules of conduct and address market failures. The strategy recognises that the country needs to have a modern and efficient technological platform and the skills and expertise to handle modern technology. To accomplish this, human capital has to be developed with a focus on technological learning and employment. Investment has to increase, especially in modern technology, while capacity and capabilities are enlarged. The strategy considers increased competitiveness and productivity as the keys to sustained industrial development. Emphasis is placed on the empowerment of SMMEs, the development of markets, and competition and international trade liberalisation with the accent on export promotion.

In a complex economic environment independent policies will be inefficient and that policies and the effort involved in the creation of an efficient competitive platform have to involve the participation of all role players. It is therefore important that the industrial development policies and strategies form an integrated approach which involves all the various disciplines, state departments and interlink with the other policies. It is, however, necessary for the South African authorities to provide adequate direction and therefore the country has policies in place regarding their strategic and informational leadership. Policies and strategies have to manage both the macroeconomic environment as well as the microeconomic foundation. To address the micro economic focus that will ensure the efficiency and productivity of individual firms in their competitive endeavours, government has also accepted the *Integrated Manufacturing Strategy* during 2002. The assumption of this thesis is that development of the country's competitive platform will promote industrial development. The intention of industrial development is ultimately to increase employment and wealth. All this implies that with industrial development, a large array of other supporting policies and actions have to be integrated and linked.

The next chapter will study the competitiveness of South Africa and its various industries. The chapter will first study the ways that competitiveness are calculated and determined and consider various surveys and databases that were compiled in the recent past. It would consider which areas are the most competitive in South Africa and which obstacles restrict industrial competitiveness, growth and development.

The objective of this thesis is to evaluate the effect that the competitive platform has on regional industrial development. The second half of chapter 5 will make an empirical analysis of the factors that influence industrial development and locational decisions. The factors that were identified in chapters 2 and 3 and various other perceptions concerning industrial location, development and the influence of governmental policies, will be determined empirically using data from manufacturing firms in South Africa.

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CHAPTER 5

THE COMPETITIVENESS PLATFORM OF SOUTH AFRICAN INDUSTRIES: EMPIRICAL FINDINGS

5.1 INTRODUCTION

Chapters 2 and 3 considered theoretical aspects of industrial policy and location while chapter 4 considered the policies and strategies of the South African government. It provided insight to the situation and the challenges that the industrial sector has to face. The purpose of this chapter is to examine South Africa's competitiveness platform by focusing on existing research and to report on results from a survey that was conducted during 2002 for the purpose of this study.

In section 5.2, the international background to measuring competitivity is discussed with specific reference to the World Competitiveness Index, the Global Competitiveness Index and AT Kearney's Globalisation Index. The problems of measuring competitiveness and criticism against measuring competitiveness are discussed.

In section 5.3 the competitiveness of South Africa is studied. In section 5.4 the provincial competitiveness of the different sub-sectors of manufacturing are identified. Section 5.5 reports on the findings of a number of recent surveys on the factors influencing firm-level competitiveness such as the National Enterprise Survey and the World Bank Survey on the Greater Johannesburg Metropolitan Area.

The rest of the chapter considers the results from a survey done to determine the competitiveness platform of South African manufacturing industries. A copy of the questionnaire is included in the annexure.

The chapter concludes in section 5.6 with a summary.

5.2 COMPETITIVENESS INDICES

5.2.1 The World Competitiveness Index

The International Institute for Management Development (IMD) annually publishes the World Competitiveness Yearbook containing a ranking of countries according to their international competitiveness based on their estimation of the World Competitiveness Index and various other indexes. In section 5.3 it is, for instance, shown that South Africa ranks 39th out of the 49 countries considered during 2002 (IMD, 2000:7).

Competitiveness involves different dimensions interacting with one another. Framer and Richman tried in 1965 to quantify competitiveness according to this principle and suggested a matrix approach. The identified four broad areas of variables: political and legal, education, socio-cultural and economic, which where matched up with various business functions like planning, marketing and production. The current IMD methodology stems from this concept (IMD, 2001:44).

IMD analyses competitiveness using 286 variables from 49 countries, which includes industrialised and emerging economies. The statistics are grouped into the four input factors of: economic performance, government efficiency, business efficiency and infrastructure. They obtain hard data from international, regional and national organisations and the remaining data from an Annual Executive Opinion Survey from 3 678 respondents in 2000. A network of 35 partner institutes is used to improve the accuracy and time of the data.

The IMD accepts the fact that firms compete against each other and not nations (as was said in chapter 2), but realise that countries have the ability to shape the environment in which firms operate, influence the competitiveness of firms in that way. IMD (2001:43) states that *"A significant part of the competitive advantage of certain nations today stems from very aggressive incentive policies emphasizing tax breaks, subsidies, etc. which are designed to attract foreign investment. Ireland is an excellent example of such an approach".*

Competitiveness of a country is not only a function the GDP and productivity, but it also depends on the ability of firms to cope with the political, cultural, educational and economic dimensions of a region. Although the competitiveness of nations and firms are interrelated concepts, IMD focuses on the competitiveness of the environment in which firms has to compete. A region will be more competitive if it can offer firms an environment that has an efficient structure, institutions and policies in which to compete. IMD measures and compares the ability of countries to provide the firms within

their boarders with an environment that can sustain their local and international competitiveness. In calculating the competitiveness index and ranking countries IMD makes the assumption that wealth creation take place primarily at the level of the firm and then determine to what extend the environment promotes such development (Rosselet, 2001:51).

In the past, the World Competitiveness Index of IMD was determined by considering a country's local economy, its' people, government, finance, infrastructure, internationalisation, management, science and technology (IMD, 2000:63). This methodology has, however, been refined and now divides the local economy into four main branches of: economic performance, government efficiency, business efficiency and infrastructure. These four factors are again divided into five sub-factors each, which emphasise every facet of the area analysed. This adds up to twenty sub-factors, which comprise more than 250 criteria, although some sub-factors got more criteria than others did. In the overall consolidation of the results each sub-factor is given the same weight irrespective of the number of criteria it contains. Finally, the twenty sub-factors are aggregated to form the total consolidation that determines the competitive index and used to rank the countries according to their competitiveness (IMD, 2001:51).

The four competitiveness input factors tries to incorporate al the different aspects that has an influence on competitiveness as was discussed above. Economic performance is measured by 68 criteria for example. The factor of economic performance makes a macroeconomic evaluation of the local economy. It also considers international trade, international investment, employment and prices. The next factor uses 84 criteria to determine the extent to which government policies are conducive to competitiveness. It also considers public finance, fiscal policy, the institutional framework, business framework and education. Business efficiency (60 criteria) determines the extent to which businesses are performing in an innovative, profitable and responsible manner. The sub-factors consider productivity, labour markets, financial markets, management practices and the impact of globalisation. A total of 74 criteria are utilised to determine the extent to which basic, technological and scientific infrastructure and human resources meet the needs of businesses. Among these sub-factors are also included health, the environment and value system (Rosselet, 2001:50). The methodology followed by IMD in its' data processing was explained in chapter 1. In its' World Competitiveness Yearbook IMD focuses more on the rankings of countries and do not emphases the competitiveness index that much.

In the following section attention will now be give to the Global Competitiveness Index and African Competitiveness Index that are determined and utilised by the World Economic Forum.

5.2.2 The Global Competitiveness Index

The World Economic Forum (WEF) publishes the Global Competitiveness Index and African Competitiveness Index. The Global Competitiveness Index is designed to predict medium to long-term growth potential. The methodology utilised by WEF utilises the Porter's Diamond as point of departure and develop it further (Porter & Christensen, 2000:31). They also except the importance of the microeconomic foundations of economic development and build it into their methodology. They also calculate a Microeconomic Competitive Index, although it shows close correlation with the Global Competitiveness Rankings (WEF, 2000:33). The final index is a simple average of the index based on survey data and the index based on quantitative data. The survey index is a simple average of the sub-indices of the following six factors: Openness, government, finance, infrastructure, labour and institutions. The quantitative index only average the first five factors, as they do not measure quantitative data on institutions (Cook & Sievers, 2001:84).

It is shown in section 5.3 that WEF ranks South Africa seventh in competitiveness among African countries (WEF, 2000:10). Global Competitiveness report 2002-2003, which examines the growth prospects of 80 countries, indicating their comparative strengths and weaknesses rated South Africa 32nd in 2002 on their Growth Competitiveness Ranking and 29th on the Microeconomic Competitiveness Ranking (WEF, 2003:12 & 31).

Openness measures to what extent government policies allow international trade and include indicators like exchange rate policy, imports and average tariff rates. The *government* factor is a variable consisting of government consumption rates, budget deficits, national tax policy, and firm's perceptions of the degree of state involvement in the private sector, government competence and taxes. The *finance* sub-index considers factors like accessibility to finance by firms, the maturity of the banking sector and corporate attitudes towards taxation. The *infrastructure* sub-index includes traditional infrastructure like the extent and quality of roads, railways, ports, but also telecommunications infrastructure, access to computers and the quality of utilities like water and electricity supply. The *Labour force* sub-index includes features of the work force that is relevant to economic growth like school enrolment, AIDS education and prevalence, and work place regulations. Under *Institutions* they consider factors like the efficiency of civil servants, the quality of legal institutions, the rule-of-law, and political and policy stability.

Source data is obtained from publications compiled by the World Bank, IMF, African Development Bank and other institutions. Different numbers of surveys are distributed relative to the importance of each sub-factor in each country. In Nigeria for example, more surveys are send to the oil and

petroleum sectors and in Botswana diamonds are of more importance. More survey data is also collected in cities than in smaller towns, and they aim to receive about 80 per cent of their sample from larger firms with more than fifty employees. The WEF also utilises partnership organisations, chambers of commerce, employers associations, manufacturers associations, export promotion agencies, market research companies, universities and other research institutions, to ensure broad sector coverage (WEF, 2001:85).

The Carnegie Endowment for International Peace together with AT Kearney calculates a globalisation index which can also be relevant to international competitiveness and it will be considered next.

5.2.3 Globalisation Index

AT Kearney and the Carnegie Endowment for International Peace determine a globalisation index and publish it annually as the *AT Kearney / Foreign Policy Magazine Globalisation Index*. The index is compiled by considering data on economic integration, personal contact, technology and political engagements, and then ranks the twenty most global nations. The factor of *economic integration* utilises data on trade, FDI, portfolio capital flows and income payments, while *personal contact* considers factors like international travel and tourism, international telephone traffic and cross boarder transfers. Under *technology* they concentrate on the number of internet users and internet host and secure services. The number of memberships in international organisations, UN Security Counsel missions in which each country participates, and the foreign embassies that every country hosts are considered under the factor of *political engagements*.

The Globalisation Index scores for each country and year is determined by adding the scores across panels. For most variables, each year's inward and outward flows are added, and the sum divided by the country's nominal GDP, or where, appropriates the population. Double weights are awarded to FDI and portfolio capital flows. Smaller trading nations tend to show higher degrees of international integration than larger economies, but the relation between size and globalisation remains complex (AT Kearney, 2002:39-44). The Globalisation Index only considers the top twenty global economies in the world and their findings are of limited value to the South African situation. Their methodology can, however, be applied also to South Africa to determine the country's own Globalisation Index, although that would not be comparable to other countries studied by AT Kearney and the country's ranking can not be determined in that way. If AT Kearney decides to calculate a Globalisation Index for more countries, including South Africa, later on that might be of some value in accessing the country's level of Globalisation and international competitiveness.

5.2.4 Problems Measuring Competitiveness

Lack of sufficient data is usually the most important limitation in obtaining proper knowledge especially in African countries. It leads to uncertainty and assumptions that are not always correct.

Collection of data usually presents some practical obstacles. In South Africa, problems are relating to distance, the extent of, the time taken to complete questionnaires, and registers sold by market research institutions often contains addresses of manufacturing firms that have closed down. Firms are in general unwilling to co-operate. Most firms see it as a waste of their time and some believe that they do not gain anything from such surveys. About four percent of the managers are unwilling to answer questionnaires that are not set in Afrikaans.

The accuracy of data can have a significant effect on the outcome of research and the recommendations that follow. Especially in Africa, the absence of data, especially accurate data, is a severe problem. Some variables are also difficult to measure. To measure the rate of new innovations in a country could, for instance, be measured by the expenditure on research and development at universities or new patents registered. Those engineers and tradesmen working the new technology on a daily basis on workshop level probably develop new ways of doing things better continuously due to their experience. Very little of it is, however, reported and it is very difficult to measure. Social capital is, for instance, often measured by the number of telephone per thousand of the community (Aron, 1997:17). Telephones are rather part of the infrastructure or technological development, while social capital would probably relate to law and order, recreational facilities and welfare services, far removed from the availability of telephones.

The international competitiveness indices are often criticised for being biased in its' approach, their definitions are to broad, the methodology incoherent and inconsistent, several measures are vague, redundant, or their calculations incorrectly done. Some even accuse international competitiveness indices of having a weak theoretical and empirical foundation and that it could be misleading for analytical and policy purposes (see e.g. Lall, 2001).

It is claimed that the main competitiveness indices used today contains several deficiencies, it is surrounded by many controversies and suffer several methodological weaknesses (See Kenny & Williams, 2001:20). It is said that theories that are supposed to identify the relationship between growth and its explanatory variables are often over-simplified, inadequate and miss-specify relationships between variables. Non-linear and unstable causal relations are often not detected, and it

ignores context or period specific factors. In the calculation of these indices, the assumption is made that a common set of factors determine growth and competitiveness across all countries.

Lall (2001:20) and others also criticise the emphasis some indices put on the principles of the Porter diamond of competitiveness. It is said that Porter does not provide a theory in terms of testable predictions on competitive advantages (-it only explains). It is said that Porters diamond of competitiveness is not a theory but only a collection of anecdotal evidence on the determinants of competitive success gathered together by vague ideas on how they are inter-related and measured. It does not regard innovation, technological change, the benefits of spill-overs, and labour costs as important factors determining competitiveness (Lall, 2001:17 & 20). This is, however, a particular point of view. It could be possible to accommodate these factors under firm strategies and rivalries, or demand conditions, for instance. It is also said that the elements of the Porter diamond are just an alternative way to represent trade theory. Even the Heckscher-Ohlin model is seen as inadequate in accommodating modern trends, but it is possible to relax some assumptions and include human capital as a primary endowment. It can then even accommodate imperfect competition, scale economies, technological leads and lags, and externalities like agglomerational benefits. The assumption of identical tastes across countries can also be relaxed in some models (Lall, 2001:18).

To accommodate some of the problems associated with the standard indices, various other indices are also determined. WEF also has a Current Competitiveness Index that employs the analytical approach of WEF and focus on the microeconomic foundations of competitiveness. There is also a microeconomic competitiveness index (Porter, *et. al*, 1999:30) and various rankings are made, for example of locational attractiveness, input factor competitiveness, and county competitiveness structures.

The Current Competitiveness Index of WEF is criticised for ignoring the model on which it is built when the index is calculated. The model assumes that the stock of productive factors and technology contributes significantly to the levels of income, but neither is measured. Physical capital is ignored and a "rather bizarre pair of qualitative variables measures human capital" (Lall, 2001:20). Technology only appears in the quantification of company strategies. Their measure of technology is not a measure that captures the total of scientific, technological and institutional capabilities in a country.

The Economic Creativity Index of WEF is criticised by Lall (2003:21) for focusing on technology that is created elsewhere, while the local innovative capacity is more relevant to competitiveness. In reality, WEF derives its main measure of innovativeness from companies that pioneer their own new products and processes. The Innovative Index utilises as explanatory variables per capita GDP, R&D personnel,

R&D spending, openness, strength of intellectual property regimes, GDP share on secondary and tertiary education, R&D share funded by private industry and R&D performance by universities. Per Capita GDP is difficult to accept as an explanatory variable, and variables like R&D spending and R&D personnel are highly inter-correlated.

Most indices could be ambiguous in causation and econometrics. Some rankings jump around from year to year with no apparent reason. It seems as if the subjective responses are not soundly based. As the market is a dynamic system, it seems logical that rankings could not remain static, but it should be within limits. Most of the questions used to assess local technological efforts only focus on the intensity and quality of local business R&D. Several questions on technology also ask the same information only in a slightly different form, raising the risk that respondents seek to differentiate their answers without adding meaningful information.

5.3 COMPETITIVENESS IN SOUTH AFRICA

5.3.1 National Competitiveness

South Africa is not regarded as very competitive according to international standards. Among the *"newly developed countries"* in the World Competitiveness Report, South Africa ranks eleventh. Even countries like Mexico, Venezuela and Chile are more competitive than South Africa (IMD, 1993:1). Even among African countries South Africa is only ranked seventh in competitiveness. Botswana is ranked third and Namibia in fourth position in Africa. The other African countries that are ranked above South Africa in competitiveness are Tunisia, Mauritius, Morocco and Egypt. The oil rich Nigeria is only ranked twentieth in Africa (WEF, 2000:10). South Africa's competitive position did increase mildly during the last decade of the twentieth century though (IMD, 2000:1). AT Kearney's FDI investment index does however rate South Africa as the most attractive region for FDI investments in Africa and the Middle East (Internet, 2002. [http://www. atkearney.com] 9 May).

The International Institute for Management Development (IMD) ranks South Africa as one of the least competitive nations in the world. IMD ranks South Africa 39th out of 49 countries (2002) when considering local economic strength, internationalisation, government, finance, infrastructure, management, science and technology, and the quality of people (see p. 219). This is an improvement from the 2001 ranking of 42nd. South Africa is ranked 46th as far as the overall economic performance of the local economy is concerned (2002) and during 1999 South Africa stood 46th among the 49 countries when considering the quality of human capital. The financial system, science and technology,

and infrastructure are the only categories where the country is ranked higher than the average for less developed countries.

Nördås (1996:725-726) constructed an index to compare South African competitiveness to the United States and found that the only product in which South Africa is competitive relative to the U.S. is the production of non-ferrous metal products. Other industries with high relative competitiveness are iron and steel, paper and printing and shipbuilding. These industries are all scale intensive with significant scope for gains from exploiting economies of scale when given access to a larger market, and are low-technology, medium-wage industries. The least competitive industries are chemicals, food, beverages and tobacco and computers and office equipment, which are unfortunately large sectors in the South African economy.

The World Competitiveness Report gives South Africa the highest ranking on infrastructure. It is mainly the strength of the business structure and the sophisticated banking system that led to this competitive placing (IMD, 1999:2). The country has a well-developed air transport, rail and road system, ports are accessible and power supply inexpensive and efficient.

Competitiveness of the South African economy is enhanced by its well-developed communication networks, internet access, and the number of internet hosts and users. Business associations are useful sources of information and it is easy to obtain laws and regulations that affect firms. Disadvantages to the country are, however, the high rate of crime, inflexible hiring and firing practices in the labour market, and a shortage of educated workers (WEF, 2000:200-201).

South Africa's competitiveness is also affected indirectly by political situation and low economic growth in its major trading partners in the SADC community. Many of these countries are characterised by poor economic conditions, political unrest and civil strife that affects South Africa's trade potential within the region (WEF, 2000:201)

South Africa's competitiveness was undermined by the policy of import substitution industrialisation (ISI) that was discussed in section 4.2 of chapter 4 and by international isolation when an outward orientated policy was accepted later. This was aggravated by booms in the gold price during the 1970s and 80s, which led to an overvalued real exchange rate, which made the country's manufacturing goods too expensive for the export market (Naudé, Oostendorp & Serumaga-Zake, 2002:1257). Other factors that also undermined the country's competitiveness are the low quality of human capital, regional industrial development policies that was not based on pure economic motives which distorted locational decisions, and the worsening of the economy since the early nineteen seventies.

Before 1994 local manufacturers were sheltered from international competition by high tariffs and import quotas and sanctions. There was a lack of strong, competition in the domestic market due to oligopolistic and monopolistic industrial market structures. This also inhibited technological development and innovation in local manufacturing. These factors, together with high taxes and low levels of human capital, have resulted in an economic environment that is not conducive to downstream manufacturing. This caused South Africa's manufacturing sector to be non-competitive (Naudé, Oostendorp & Serumaga-Zake, 2002:1268).

According to international benchmarking by the IDC (1998), several of the country's downstream industries, like metal products, automotive components, wooden furniture, particleboard and footwear, are fundamentally uncompetitive. South African manufacturers have a production cost disadvantage compared to most of its global competitors.

International benchmarking studies by the IDC (1998) found that the low level of competitiveness of South African manufacturing industry is also due to higher costs of raw material inputs, and high overhead and marketing costs in addition to relative high wages and low productivity. Because of the importance of the raw material resource base of South Africa, it is often stated that the country should specialise in the beneficiation of raw materials. Studies by the IDC found however that South Africa's apparent advantages in commodity production are not passed on to local downstream users and producers in competitor economies are able to source materials at lower costs. This cost advantage is in some instances from 45 per cent to 60 per cent.

The reasons why South Africa has an uncompetitive cost advantage in materials and other components are because of the application of inefficient and outdated technology, and short production runs are aimed at product ranges that are too broad to be efficient due to South Africa's lack of specialisation. Long delivery lead-times and inconsistent material supplies also lead to higher stock holding by downstream producers. Furthermore, dual pricing policies often occur whereby the prices of materials used in the production of goods for export are cross-subsidised by higher prices on those utilised in the production of goods destined for domestic consumption (Naudé, Oosterdorp, & Serumaga-Zake, 2002:1247).

The cost of capital is also too expensive for competitive business development, while the sophistication of the country's financial markets forms a competitive advantage for business development. The banking sector exercises a positive influence on industry leading to higher

competitiveness (IMD, 1999:2). The Johannesburg Securities Exchange is expected to remain offering the most desirable opportunities for investment in emerging-market funds (WEF, 2000:204).

Science and technology has weakened since 1992, but a real growth in total expenditure on research and development of more than nine per cent in 1993 positively effected competitiveness (IMD, 1993:5). South Africa's internationalisation, science and technology are ranked among the seven most uncompetitive countries in the world by 2000 (MID, 1999:6). Still only 4.2 per cent of the South African population are connected information technology based users compared to 39.9 per cent in the United States. Relating to the stock of skills in information technology, the *World Competitiveness Yearbook* (2000) rank South Africa last among 47 countries. Research co-operation and technological strategies rank very high in international context though (IMD, 1993:237) and this trend is even increasing in the third millennium.

On advantage South African labour is, relative to the richer countries, inexpensive. The South African labour force is, however, mostly unschooled and unproductive; a man-day labour is therefore not absolutely comparable to its equal in the USA. This lowers the country's competitiveness, especially with the poor exchange rate. The manufacturing industry thus has a very low capacity to absorb new and advanced technology, seeing that so little capital has been invested in South Africa's human capital (Joffe, 1994:59). Labour cost per worker in South African manufacturing was US$8 475 between 1990 and 1994, which is about twice as much as in most other SADC countries. The value added per worker is however US$16 612, which is at least twice as high as in most other African countries (World Bank, 1999:64).

Although labour is generally relatively expensive in South Africa, people's standard of living is still generally low. The high wages and low productivity of labour increase prices to such an extent that the country has lost competitiveness in many products. Thus, for example, South Africa has a competitive advantage in unwashed wool, but in washed, carded or otherwise processed wool there is a comparative disadvantage (Kleynhans, 1989:509). South Africa's labour is however still much cheaper than labour in the rich countries.

General labour productivity grew at a much faster rate than in the manufacturing sector and in absolute terms, labour productivity actually declined in manufacturing. Between 1985 and 1995 capital productivity declined in all nine provinces (WEF, 2000:203). A lowering in the marginal capital output ratio is a prerequisite for higher growth and employment creation. In the long term capital should not increase faster than output. Fixed capital is, however, significantly under-utilised in South African manufacturing (Van Zyl & Kleynhans, 1995:8). This should receive attention as the scarcity of capital

limits the size of the domestic market and industry's ability to become internationally competitive. Wage increases and the resulting capital-labour substitution resulted in a decline in employment.

Labour productivity, as measured by GDP per worker, grew on average by 2.5 per cent per annum between 1990 and 1995. This is, however, still substantially lower than South Africa's main competitors, especially the newly industrialised countries of the East such as Taiwan, (4.7%), Korea (4.51%), Hong Kong (3.7%) and Singapore (3.0%). Labour productivity is closely linked to unit labour costs. The rising unit labour costs of South African manufacturing had resulted in smaller increases in labour productivity in South Africa than many other countries. It impinges negatively on South African firms' capacity to compete in the international market on the basis of price (IDC, 1998).

Labour productivity in South Africa's manufacturing grew annually by an average of only 0.9 per cent, between 1972 and 1990, compared to 9.7 per cent in China, 7.6 per cent in Indonesia, 8.2 per cent in Korea and 5.9 per cent in Taiwan. By 1993 the manufacturing earnings in the Northwest Province of South Africa were, for example, US$ 9088 per annum, compared to a much lower labour cost of US$656 in China, for instance. Neighbouring countries such as Botswana (US$3311) and Zimbabwe ($3550) also offers cheaper labour than South Africa (IDC, 1998).

5.3.2 Provincial Manufacturing Competitiveness

Suleman (1998) conducted cluster studies in a spatial context in order to identify the most important potential clusters in the various provinces of South Africa. The study was based on the 1996/97 Regional Industrial Location Study (RILS) and identified key candidates for clustering on the basis of the value it adds, the employment opportunities it provides, output specialisation ratios, export specialisation, sector competitiveness and sector concentration. These results indicate the potential competitiveness of regions and can be an aid in spatial industrial development planning of provinces and indicate were South Africa's potential fields of competitiveness are spatially located.

Sectorial competitiveness was identified by using export specialisation (as by Porter, 1990:745) and the product specialisation ratios (location quotient) (DBSA, 1995:187). The export specialisation ratio (ESR) is calculated by the formula:

$$ESR = \frac{\text{export of sector x in province / output of sector x in province}}{\text{export of sector x in SA / output of sector x in SA}} \quad \ldots.(1)$$

The export specialisation ratio provides an indication of the ability of a sector in a province to export as compared to the ability of that sector to export at a national level. The export specialisation ratio was used as a measure of competitiveness. In the case of a mineral dependant province, it may be an

indication on an undiversified provincial economy. Although competitiveness entails more than the ability to export, this ratio may indicate the ability of the industry to compete in export markets. However, this is a relative indicator, highlighting relatively more export intensive sectors per province. It should therefore not be seen as an absolute measure of competitiveness.

The location quotient / production specialisation ratio is an indicator highlighting the relative importance of a sector to the province vis-à-vis the importance of a sector nationally. The formula used to calculate the location quotient is as follows (DBSA, 1995:187):

$$\textit{Location Quotient (LQ)} = \frac{\text{Share of sector in province / Provincial GGP}}{\text{Share of sector in SA / Total GDP of South Africa}} \qquad \ldots.(2)$$

The above ratio in equation (2) is an indication of the relative concentration of the sector in the province compared to South Africa as a whole. It gives an indication of the comparative advantage of an economy (DBSA, 1995:187). A location quotient will be larger than one for a particular sector when the share of the sector in the specific economy is greater than the share of the same sector in the aggregate economy, i.e. the province exhibits a comparative advantage in the specific sector (DBSA, 1995:187). The location quotient or product specialisation ratio is plotted as a circle, with the relative size of the circle indicating the location. Hence, the larger the value, the more concentrated the sector tends to be in the particular province (Suleman, 1998:25).

Figure 5.1: Matrix Identifying Competitive Sectors

Export Specialisation	High Competitiveness low Output Small/Export Focus	High Competitiveness High Output Performer
	High Competitiveness low Output Weak Sector	High Competitiveness low Output Internal Focus

Product Specialisation

Combining the export and product specialisation ratios is useful in that the export specialisation ratio is an indication of the level of competitiveness of the sector whilst the product specialisation ratio shows whether the province has a comparative advantage in that specific sector. These two indicators were combined in matrix format and utilised to give an indication of the competitiveness of the various

sectors and the comparative advantages of the provinces. Figure 5.1 gives an example of the matrix utilised (Suleman, 1998:22).

Sectors that exhibited both a comparative advantage and were competitive were classified as "performers", whilst sectors that were uncompetitive (on the basis of the export specialisation ratio) but exhibited comparative advantage (based on the product specialisation ratio) were termed "internal focus". On the basis of the new trade and industrial paradigm, with the focus on increasing the level of exports, policy makers prefer sectors that are relatively more export intensive.

The key sectors that have historically exhibited potential in the *Western Cape* are food processing, textiles, chemicals and fabricated metals. Sectors that have not historically demonstrated potential are wood, paper, non-metallic minerals, and basic metals. The sectors demonstrating potential in the province and which might be candidates for clustering, based on these factors, are food processing, textiles, wood, basic and fabricated metals. Those that show no apparent potential are paper, chemicals and non-metallic minerals. Overall the only sectors that exhibit no potential are paper and non-metallic minerals (Suleman, 1998:181).

The key sectors that have exhibited potential historically in the *Eastern Cape* are food processing and fabricated metals. The paper-sector and to a lesser extent 'other manufacturing' have historically exhibited no performance. All manufacturing sectors excluding paper may thus be claimed to exhibit potential for further development (Suleman, 1998:217).

None of the manufacturing sectors in the *Northern Cape* exhibits any significant potential and the province has no key candidates for clustering. The sectors demonstrating most potential in the province are food processing and basic metals (Suleman, 1998:192).

The only sector that has historically exhibited potential in the *Free State* is that of food processing. The sectors demonstrating potential for clustering in the province based on these factors are food processing and chemicals. The rest exhibit no significant potential for further development (Suleman, 1998:204).

The key sectors that have historically exhibited potential in *the Province of KwaZulu Natal* are food processing, textiles, paper, chemicals and basic metals. Sectors that have not historically demonstrated potential are non-metallic minerals, and to a lesser extent wood products and fabricated metals. The only sector in the province that has no apparent potential in the province is that of non-metallic minerals (Suleman, 1998:165).

The key sectors that have historically exhibited potential in *Limpopo Province* are food processing, wood and fabricated metals. The sectors demonstrating potential for clustering in the *Limpopo Province* based on these factors are similar to those that historically exhibited potential, with the exclusion of fabricated metals, and the inclusion of basic metals. The basic and fabricated metals sectors are part of the same supply chain, with the fabricated metals sector sourcing the bulk of its inputs from basic metals. It may be possible to develop a cluster around the metals sector (Suleman, 1998:242).

Most of the *Gauteng Province's* establishments produce fabricated metal products and machinery, which is an indication of a strong industrial cluster that exists in *Gauteng Province* (DBSA, 1998a:84). The key sectors in *Gauteng* that have historically exhibited potential are food-processing, chemicals, basic and fabricated metals. This is largely due to the level of concentration in the province and the existence of forward and backward linkages of these sectors in the province. The sectors demonstrating potential for clustering in the province based on these factors are paper, chemicals, non-metallic minerals, basic and fabricated metals. This is as a result of the additional investment into these sectors and the potential for developing forward and backward linkages within these sectors. Overall, it is only the textiles and wood sectors that exhibit no apparent potential in *Gauteng* (Suleman, 1998:256).

In the *North West Province* Key sectors that have historically exhibited potential are food processing and fabricated metals. None of the other manufacturing sectors have shown any significant performance in the past. Based on the potential for clustering the sectors demonstrating potential in the province are chemicals, non-metallic minerals, and basic and fabricated metals. Overall the only sector that exhibits no apparent potential is textiles (Suleman, 1998:268).

The key sectors that have historically exhibited potential in *Mpumalanga* are food processing, wood, chemicals and basic metals. Sectors that have not demonstrated potential historically are textiles, paper, non-metallic minerals, and fabricated metals. The sectors demonstrating potential for clustering in the province based on these factors are food processing, wood, paper, chemicals, basic and fabricated metals. Those that show no apparent potential are textiles and non-metallic minerals (Suleman, 1998:231).

The findings of these cluster studies indicate that economies of scope may have the potential to enhanced competitiveness in provinces if agglomeration is further developed. It focuses, however, on historic patterns of production, which were traditionally agricultural and recourse based. It did not take the new economy, globalisation, and the effect of modern production technology into regard and this

might lock industries into the low growth cycle if further developed. It does, however, present insight in the current competitiveness and potential of the various provinces based on it.

5.3.3 Provincial Overall Competitiveness

Table 5.1 shows the average comparative advantages of the various provinces of South Africa based on PIMSS data[1]. The table indicates that manufacturing has the highest average comparative advantage in Gauteng, followed by the Western Cape and KwaZulu Natal. The primary sector shows exceptional high agricultural compatibility in the Northern Cape, Free State and the Western Cape. Averages do, however conceal much detail information and circumstances. Gauteng is also the most competitive in mining, followed by the Northern Cape and North West. This does, however, differ much if one considers individual districts (see below). Construction, which is an important industry that also has to ensure sustainable competitiveness of the economy in future, also has the highest average comparative advantage in Gauteng, followed by Limpopo Province and Western Cape.

Table 5.1

Average Comparative Advantage of Provinces

2000

Province	Manuf	Agric	Mining	Elect	Constru	Trade	Transport
Eastern Cape	0.559	4.165	0.060	0.255	0.825	0.960	0.571
Free State	0.538	6.293	0.918	0.961	0.764	0.728	0.705
Gauteng	0.877	0.895	1.697	0.647	2.644	0.877	0.933
KwaZulu	0.824	4.072	0.359	0.813	0.928	0.759	0.602
Limpopo	0.318	1.698	0.946	1.585	1.501	1.134	0.600
Mpumalanga	0.509	3.654	1.000	1.435	1.130	0.964	0.633
Northern Cape	0.246	7.565	1.499	1.033	0.781	1.087	0.942
North West	0.587	4.915	1.261	0.520	0.811	0.967	0.646
Western Cape	0.856	5.433	0.139	0.608	1.284	1.032	0.925

[1] The Planning and Implementation Management Support System (PIMSS) is a nation-wide support system for the municipal Integrated Development Planning (IDP) process of the Department of Provincial and Local Government (Internet, 2002. [http://www.pimms.net] 3 May). The PIMMS management support system also provides a database known as the Information on Development and Economic Activity (IDEA Explorer) database. It has a number of categories, including demographics, economics, education, environment and tourism, water, health, poverty, safety and security, CMIP, public works, housing, transport, electricity, and telecommunications (Krugell, Internet, 2002. [http://www.econ-oom.com] 3 May).

The competitiveness indices of the supporting and services sectors show that Limpopo, Mpumalanga and the Northern Cape have the highest competitiveness in electricity. This is mainly due to large coal deposits and electrical power generation in these provinces. Gauteng and the Western Cape is producing the most GDP in South Africa, being the most developed, and it therefore has the highest competitive indices in most categories. This also implies to transport, even though Gauteng is land locked and transport would be a major cost to production and exports. Trade does, however, have the highest average index in the Limpopo Province, followed by the Northern and Western Cape Provinces.

Considering the individual districts in South Africa, comparative advantage of local economies do differ much from provincial averages, due to their particular location and natural endowments. Considering manufacturing, Table 5.2 indicates that Sasolburg is the most competitive magisterial district due to the petroleum and chemical clusters in that area. Hoëveldrif in Mpumalanga and Umzinto in KwaZulu follow this. Construction is a long-term capital investments, and once a road, bridge, dam or building is built, it lasts for several years. This might be one of the reasons why competitiveness in construction can vary so much from year to year. The most competitive districts in 2000 were Weenen in KwaZulu, Namakgale in the Limpopo Province followed by Prince Albert, as the Western Cape usually enjoys economic growth.

Table 5.2
Most Competitive Districts in South Africa
2000

District	Manuf.	District	Construct.
Sasolburg (Free State)	3.23	Weenen (KwaZulu)	4.37
Hoeveldrif (Mpumalanga)	3.09	Namakgale (Limpopo)	3.64
Umzinto (KwaZulu)	2.81	Prince Albert (Western Cape)	3.24

Table 5.3 shows the most competitive districts of the primary sectors. Tarka in the Eastern Cape is the district with the largest competitive index for agriculture, followed by Fraserburg and Kenhardt. Although large parts of the Northern Cape are very arid and semi-desert, the last mentioned districts are both situated there. It should, however, be noted that this is not representative of the whole province. The north-western Free State has of the world's largest deposits of gold ore, and this is why

Theunissen is the most competitive mining district in South Africa. Phalaborwa follows this with large deposits of iron although other rear metals, like titanium, are also present in the area. Gauteng is endowed with various minerals in large quantities, often the world's biggest deposits. Oberholzer with its large deposits of gold are therefore the third most competitive mining district in the country.

The comparative advantages of the supportive and service industries in the leading districts in South Africa are summarised in table 5.4. The table shows that Philipstown, Ellisras and Kriel have the most competitive advantage in electricity as these districts have large power stations. Mpumalanga has large coal deposits and most of South Africa's electricity is therefore generated in that province. This, together with the fact that Kriel is situated close to Gauteng, gives that district a special advantage in electricity. Before investing large amounts in a region a proper study should, however, be done as a few figures might not tell the whole story and it could even be incorrect. The PIMMS / WEFA data shows, for instance, that Balfour in the Mpumalanga is one of the most competitive districts in the country with a competitive index in electricity of 9.63 (2000). The Grootvlei power station in the Balfour district has however been "moth-balled" for the largest part of the past six years, as it could not be run profitably.

Table 5.3
Comparative Advantage in the Primary Sectors

Agric	Index	Mining	Index
Tarka (Eastern Cape)	23.96	Theunissen (Free State)	13.1
Fraserburg (Northern Cape)	18.4	Phalaborwa (Mpumalanga)	11.65
Kenhardt (Northern Cape)	18.3	Oberholzer (Gauteng)	11.52

Calvinia in the Northern Cape is the most competitive trade center followed by Flagstaf and Molteno both in the Eastern Cape. Transport is often a major cost to companies. Pearston in the Eastern Cape, has the highest competitive index on transport, followed by Waterval Boven (Mpumalanga) and Sterkstroom (Eastern Cape). Some of the figures are, however, summaries that could give the wrong impression. Gauteng has, for example, a large comparative advantage, as the province is a large user of electricity. Mpumalanga on the other hand has large advantages because it generates a lot of electricity. One should, however, not confuse production and services, for example Uitenhage, Port Elizabeth and East London districts has large comparative advantages in the manufacturing of motor vehicles, but

this relates to its competitiveness in manufacturing. Transport relates to the movement of people and goods. It considers a service and does not refer to the manufacturing of transport equipment.

Table 5.4
Competitive Index of the Supporting and Service Sectors
2000

Electricity	Index	Trade	Index	Transport	Index
Philipstown (Northern Cape)	20	Calvinia (Northern Cape)	3.4	Pearston (Eastern Cape)	3.54
Ellisras (Limpopo)	18.6	Flagstaf (Eastern Cape)	3.31	Waterval Boven (Mpumalanga)	3.22
Kriel (Mpumalanga)	17.5	Molteno (Eastern Cape)	2.56	Sterkstroom (Eastern Cape)	2.98

Studying the data of 1990, 1996 and 2000 shows that nearly all districts and most sectors of industry experienced improvement in their competitiveness during the past decade. This is a sign of economic development. Although much has been done since 1994 to enhance economic development, the patterns of comparative advantage of most districts, relative to each other, did not really change significantly. Industries that were winners in 1990 are in most cases still the winners. The ranking in each region remained the same since 1990 in most cases. It is also notable that most districts have some comparative advantage in at least one sector, but there are also districts with no apparent advantage at all. Under-developed districts of the past like Soweto are still stagnating.

This section considered competitiveness of South Africa and the potential of the various provinces. The following section will consider various studies on competitiveness in South Africa, focussing mainly on the obstacles to competitiveness. It will consider studies on the South Africa nationally, provincial and local urban level.

5.4 OBSTACLES TO COMPETITIVENESS

5.4.1 The National Enterprise Survey

The assumption of a direct link between investment behaviour and competitiveness could probably be made. Companies will only invest if expectations of a positive return exist, and if companies are not

competitive this will not be possible. The National Enterprise Survey (NES) drew a sample of 1425 firms from a population of 40 000 and attempted to determine what determine the rate of investment of South African firms and what the obstacles are that give rise to the low and declining investment rate.

The NES found that firms invest in a pursuit of efficiency and higher productivity, which would make them more competitive. The most important reason why firms spend on capital is to raise efficiency, modernise technology and replace depreciation on capital goods. Answering to aggregate demand and sales outlook is the next important reason for investment. Attempts to enter new markets are not a major reason for firms to invest, but a moderate motivation for secondary investment.

Obstacles to investment decisions as well as their everyday operations are:

- High interest rates
- Crime and social issues
- Labour legislation
- A shortage of skills
- Uncertainty concerning government's economic policy and thus
- Socio-political issues (Gelb, 2000:1).

Specific measures to raise investment rates through the enhancement of demand and firm profitability will only be successful if the underlying expectations and confidence can be restored. The NES study identified the socio-political issues as the most important factors that retarded investment by firms. Firms will not invest if expectations of losing everything are too high. Seen from this perspective, low investment rates are not due to racist attitudes on the part of business towards a black government, but it is part of sound economic management. NES claims that insecure property right and popular demand of the masses for a better income distribution increases risk and causes obstacles to investment (Gelb, 2001:22).

The NES study found that more than half of the firms use retained earnings as their main source of investment finance. This emphasises the importance of competitiveness, profitability and interest rates in the determination of investment. All firms see interest rate levels, crime and social issues as the major obstacles to investment in South Africa. The impact of labour regulations is an obstacle nearly as important as the first two, closely followed by uncertainty about government's economic policy and inadequate tax incentives. A positive point is that the availability of investment finance is not a major obstacle to firms. The cost of funds is a much bigger obstacle than its availability.

Labour regulations have a major impact on firm's investment decisions. The impact of regulations on dismissal and hiring employment are perceived as major obstacles to investment. The increasing impact of trade unions and collective rights is also seen as factors that jeopardise future investment as expectations on risk are negatively influenced. Bribery was, however, found to be an insignificant factor influencing investment, both in the public and private sectors.

Changing interest rates has a large effect on larger firms though firms with less than fifty employees are rarely affected by it. Firms are also more elastic towards rising interest rates, but when interest rates decline firms usually adopt a wait and see attitude. Variations in the exchange rate have a large effect on large firms, as they tend to import more capital goods than smaller firms do. There is a need for stabilisation mechanisms that could partially insulate the local market from exogenous shocks emanating from the international economy, as the volatility from this has significantly increased during the last decade of the twentieth century (Gelb, 2001:8, 14 & 22).

A major obstacle to investment by local firms is uncertainty about government policy. Firms are concerned about the broader impact government has on their operating environment and this has a negative influence on expectations of future investment returns. Most firms also believe that government rarely takes account of their concerns in policy making. About 56 per cent of the large firms and 68 per cent of the small firms believe that government policy is unpredictable and inconsistent and without a clear framework. NES found uncertainty and risk as being the largest obstacle to both daily operations of firms and growth in investments.

The NES study found that firms are insecure over their property rights and their investment and innovation are restricted due to uncertainty about their claims on future returns from their operations of the assets they purchased and installed. Adequate control over returns on assets and the future distribution of the income generated by those assets are uncertain. NES sees this, however, as a natural phenomenon in societies where the fundamental transformation of the balance of political power cause firms to perceive higher risk and uncertainty. They therefore state that the problem of low investments is not due to racial or cultural attitudes of firms towards the government, or distance from government resulting from racial or cultural divisions (Gelb, 2001:22). The economic debate within the governing party and also with their allies like the COSATU trade union and the Communist Party on economic policy, especially concerning GEAR, increases negative perceptions. It indicates a lack of a consensual framework for economic policy, and a change in leadership in the ruling alliance could lead to significant changes in policy and endanger property rights. These possibilities increase risk and uncertainty, reducing the investment rate and the country and its' firm's competitively.

A credible framework that can maintain macroeconomic stability is necessary but it will only improve investment and competitiveness if the distributional conflict can be well managed. NES suggests that the perceptions of firms should be lowered concerning the risk that government policy and regulatory bodies might shift substantially in future, and that firm's property and employees face threats from crime and illegal activities. Income should not be redistributed away from firms but the approach of redistribution should be moved away from the present focus on the current income levels, towards rising future income levels based on economic growth (Gelb, 2000:3). It is also suggested that a broadening of the scope of redistribution to focus on collective assets like skills, housing and land could provide incentives to groups and individuals to contribute to future growth in order to acquire higher income streams in future.

5.4.2 World Bank Survey on the Greater Johannesburg Metropolitan Area

The World Bank conducted a survey in partnership with the Greater Johannesburg Metropolitan Council in an effort to understand the micro-foundations of South Africa's weak economic performance. They attempted to determine the mechanisms through which metropolitan centres can contribute towards the national objectives of economic growth and poverty reduction. The study conducted seven surveys on 325 large manufacturing firms in the Greater Johannesburg Metropolitan Area (GJMA). Large firms are defined as firms with fifty or more employees.

The GJMA Study found that the main constrains to competitiveness and investment are:

- Crime and violence, and
- A shortage of skilled labour

Other important obstacles to growth and investment is:

- Labour regulations
- Interest rates and
- Currency volatility

The study also focused on the Johannesburg metropole because more than 80 per cent of South Africa's GDP is produced in urban areas and they house about 60 per cent of the population. Much could be learned about South African Manufacturing in Johannesburg as the metropole represents 42 per cent of all South Africa's manufacturers.

In the GJMA study 95 per cent of the manufactures identified crime and violence as the most important constraint to investment and growth. Up to 83 per cent of the respondents were victims of crime during 1998 and 61 per cent of the firms reported their workers being victimised between home

and workplace. Firms spend on average 1.6 per cent of their sales revenue on security devices and guards during 1998 and half of the firms increased there expenditure on crime prevention between 1997 and 1998 (World Bank, 2001:12).

A shortage of skilled labour is the second most important obstacle to competitiveness and growth of large firms in the Johannesburg area. Finding people with managerial and professional skills is a great problem experienced by about eighty per cent of the firms, while about seventy percent of the firms have problems finding labour with service and craft skills. It must be noted that a shortage of skilled labour caused bottlenecks to growth and investment of firms, was reported during 1998, which was a year when the South African economy experienced a deep recession. When the economy begins to enjoy rapid growth, these shortages would be become a severe constrain to manufacturing (Chandra *et al:* 2001:40). Despite their problem of finding skilled labour, only about 35 to 40 per cent of the firms provide training to about a third of their labourers (Chandra *et al:* 2001:44).

Labour regulations are an important constraint to manufacturing investment and growth. About forty percent of the firms reported that labour regulations had a cumulating effect on their employment decisions. In response to new labour legislations, they hire less people, substitute labour for capital goods, by mechanisation and robotics for example, and hire temporary workers (Chandra *et al:* 2001:32). The GJMA survey found some evidence that the new labour legislation that is intended to address the inequality of the past is resulting in job losses and decreasing the flexibility of firms to respond to changing market conditions.

High interest rates affect 61 per cent of the large manufacturing firms adversely. Lower interest rates will, however, not lead to a significant increase in investment. Only between 30 and 40 firms reported that a drop in interest rates would lead to higher interest rates (World Bank, 2001:19). The effect of lower interest rates seemed to follow logically to higher investment rates and the fact that it does not is rather surprising. Firms probably allocate investment funds as part of their total financial budget and only invest if they realised surplus funds and a need to invest exists. Higher market demand for their products due to lower interest rates would probably be the strongest incentive to increase their investments.

The high volatility of the exchange rate is also a factor, which present a large obstacle to investments and growth of large firms. Like interest rates its effect works mostly indirectly. When the currency depreciated strongly during 1998, exports did not really improve. Even though government presented several export promotion programmes, there were excess production capacity in most firms, forward contracts permitted purchases of imports at a stable price and international market demand were

strong (World Bank, 2001:25). The depreciation of the South African currency during the severe recession in 1998 was not enough to compensate for the overall risk perception of firms and concerns about future volatility probably outweighed the benefits of the depreciation.

5.5 MEASURING THE COMPETITIVENESS PLATFORM OF SOUTH AFRICA

5.5.1 Methodology

From a total of 14 000 manufacturing firms in their database, the UNISA Bureau of Market Research took a sample of 450 manufacturers on a random sample base, stratified on all nine provinces and ten major manufacturing sub-sectors (Standard Industrial Classification SIC 30111 - 39520). The computer program SPSS 10.1 was used. The data was first divided into the different SIC sub-sectors and then a "random sampling" was done. In simple random sampling all elements in the population (SIC groups) have a known equal chance of being included in the sample (Martins, Loubser & van Wyk, 1996). A random sample based on the number of cases (50 firms from each SIC sub-sector equally divided between provinces) was taken without replacement; so the same cases could not be selected more than once. The questionnaire was then posted to these selected 450 firms between February and July 2002 and of those 67 were eventually returned (one was received after most of the analysis was done and mainly disregarded). This is a 14.7 per cent response, which is regarded as satisfactory for a mail-based survey.

The questionnaire was compiled based on Porter's Competitiveness Diamond, which represents the industrial competitive platform as described in section 1.2 and 2.4 of chapters 1 and 2 and a copy of the questionnaire is attached in the appendix at the back of this thesis. The questionnaire is divided into ten sections. The questionnaire is divided in the following sections: Part 1 contains general descriptive questions about the responding firm, like type of products, size and location. The second part attempts to measure the value of Spatial Development Initiatives (SDIs). Part 3 focus on competitive strengths and it is divided into the seven main categories namely: human capital, resources, demand conditions, related and supporting industries and institutions; firm strategy, structure and rivalry, technology and innovation, and quality and environment. This part of the questionnaire is important as it provides much information related to the Porter Competitiveness platform.

The questions in sections 3 and 5 required a subjective response rating factors on a five-point scale between "poor, fair or good". Questions based on a five-point scale leads respondents to provide a rating

using a limited number of response alternatives, also forces them to take a stance and the tendency to choose a neutral position is avoided. For analytical purposes, numerical codes was assigned to the different response categories in order to compute an overall evaluation score that reflects the respondent's attitude towards each object.

The next sections considered aspects relative to the location of their premises, linkages, opportunities, beneficiation of products and expansion possibilities. Part 4 considered possibilities for expansion and possible locations for expansion. Part 5 considers the beneficiation of production output, flexible production, the educational levels of employees and reasons for absentees. Part 6 considered backward linkages and possible manufacturing opportunities. Aspects of the manufacturing plant's location were investigated in part 8.

The last two parts considered current business conditions, perceptions and expectations. Part 9 of the questionnaire considered the estimated current activities of manufacturers and asked questions on the future expectations of manufacturers. The final part 10 included questions to determine factors that assist and obstruct manufacturing activities and competitiveness, like sale volumes, costs factors, investment opportunities, shortages and other aspects that hamper manufacturing activities, as well as expectations on investment possibilities and possible limitations during the following twelve months.

The responses to the questionnaires was analysed using SAS-programming. Statistical analysis to determine the reliability and the validity of the results obtained in the survey was conducted first. The Cronbach Alpha test for reliability was implemented to determine reliability coefficients and the results were statistically significant. The values the Cronbach-Alpha coefficients for the various groups of questions are given in table 5.5 and indicate that they served as a reliable instrument to measure the proposed objectives of the study. To be reliable instruments Cronbach-Alpha coefficients should exceed 0.5 and table 5.5 indicates that all values were satisfactory, and most in excess of 0.8. The positive results on the reliability of the data enables an in depth analysis of the responses to the different questions of the questionnaire. The high Cronbach-Alpha values and the consistency of the responses to the items in the survey suggest that respondents completed the questionnaire with great care and a high degree of accuracy.

Affirmative factor analysis was conducted and the results were as follows: With *Human recourses* three factors were retained explaining 69.1 per cent of the variance, probably because the section focused on the

Table 5.5	
Question Groups	**Cronbach-Alpha Coefficients**
Human Capital	0.855
Resources	0.892
Demand Conditions	0.815
Related & Supporting Indust. & Instit.	0.878
Firm Strategy, Structure & Rivalry	0.873
Technology & Innovation	0.914
Quality & Environment	0.801
Perspective & Expectations: Current	0.868
Perspective & Expectations: Future	0.789
Shortages: Current Quarter	0.917
Shortages: Future	0.863
Obstacles: Current	0.79
Obstacles: Compared to previous quart	0.816
Future Expectations	0.622
Future Limiting Factors	0.737

availability of labour groups, productivity and perception of the government. The final communalities ranged between 54.39 and 86.1 per cent for the availability of unskilled labour and managerial staff respectively. With *resources* six factors was retained that explained 78 per cent of the variance as this group contained a large number of questions (19). The final communalities ranged between 68.7 and 89.8 per cent. *Demand conditions* only retained two factors, which explained 60.7 per cent of the variance, while the final communalities ranged between 34.3 and 72.6 per cent. With *related and supporting industries and institutions* three factors are retained, explaining 66.5 per cent of the variance and the final communalities ranged between 39.2 for local supplies and 78.7 per cent for membership of business associations. In the question group *firm strategy, structure and rivalry* three factors were retained, explaining 73.9 per cent of the variance and the final communalities ranged between 54.2 and 86.1 per cent concerning co-operation with clients and managerial skills respectively. *Technology and innovation* had three factors retained, explaining 78.3 per cent of the variance and the final communalities ranged between 61.8 and 90.8 per cent for internet use and new patents respectively. With *quality and environment* two factors were retained, explaining 64.7 per cent

of the variance, probably because quality of production and environmental legislation do not belong together in one question group. The final communalities ranged between 36.4 and 83.3 per cent for the quality of material inputs and the costs of compliance to standards respectively (Tabachnick, 2001:372).

Considering the questions on *current perspectives and expectations* four factors were retained, explaining 75.6 per cent of the variance and the final communalities ranged between 63.6 and 84.6 per cent for production volumes and unfilled orders respectively. Questions on *future perspective and expectations* had four factors retained, explaining 75.5 per cent of the variance and the final communalities ranged between 56.7 and 91.8 per cent for unfilled orders and local sale volumes respectively. With *shortages during the current quarter* two factors were retained, explaining 63.9 per cent of the variance and the final communalities ranged between 44.3 and 84.4 per cent for competition from other firms and shortage of electricity respectively. Among *future shortages* four factors retained, explaining 77.7 per cent of the variance and the final communalities ranged between 55 and 91.7 per cent for managerial staff and the availability of water respectively. The section on *obstacles compared to previous quarter* had three factors retained, explaining 64.1 per cent of the variance and the final communalities ranged between 41.1 and 84.8 per cent for tax laws and lead time for expatriate work permits respectively. *Current obstacles* had four factors retained, explaining 72.4 per cent of the variance and the final communalities ranged between 53.1 and 84.4 per cent for lead time for expatriate work permits and the availability of medium term finance respectively. *Future expectations* had three factors retained, explaining 74.5 per cent of the variance and the final communalities ranged between 66.1 and 80.1 per cent for volumes of goods imported and general business conditions respectively. Finally among the questions on *future limiting factors* two factors were retained, explaining per cent of the variance and the final communalities ranged between 50.1 and 73.4 per cent for insufficient demand and the cost of credit respectively.

Once the validity of the questionnaire as reliable measuring instrument and the consistency of the respondents were established, descriptive statistical analysis of the data was conducted. Averages and one-way analyses of variance were determined. The statistical data analysis is based on descriptive statistics such as frequency distributions, and also considered specific topics studied in previous chapters of the thesis, while competitiveness indices will also be calculated to provide more information on the competitiveness platform.

The following section will introduce the responding firms, giving a profile of their size, employment, the sub-sectors and geographical location where they are located. Then the competitiveness platform of South African manufacturers will be analysed. An empirical investigation will be done on the:

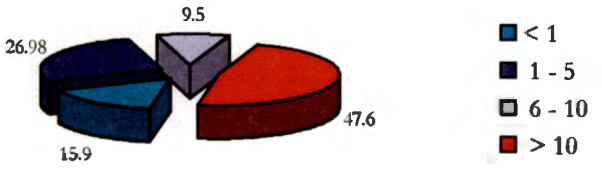
- Overall competitiveness of all manufacturers in South Africa that participated in the survey.
- Difference in competitiveness according to the size of the firm
- Competitiveness according to the manufacturing sub-sector, and
- Competitiveness of the provinces in South Africa

5.5.2 Profile of the Firms Surveyed

5.5.2.1 Turnover

A large proportion of the respondents were large firms although the spread was not out off proportion as indicated in figure 5.2. A total of 47.6 per cent of the firms have an annual turnover in excess of R10 million and 15.9 per cent have a turnover of less than a R1 million annually.

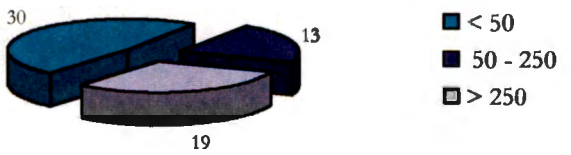
Figure 5.2 Annual Turnover Of Firms
R million



5.5.2.2 Employment

The response from larger firms was probably better because larger firms have the capacity to answer, while smaller firms often do not have the capacity to respond. This argument does not hold, however, when the

Figure 5.3 Number of Employees



number of employees is considered. As can be seen in figure 5.3, most respondents were from small firms (45.5%), while only 28.8 per cent came from large firms. The number of employees ranged between one and 8 400 employees. The average age of the firms was 30 years ranging between one and 105 years.

5.5.2.3 Sector

Figure 5.4 Manufacturing Sub-Sectors

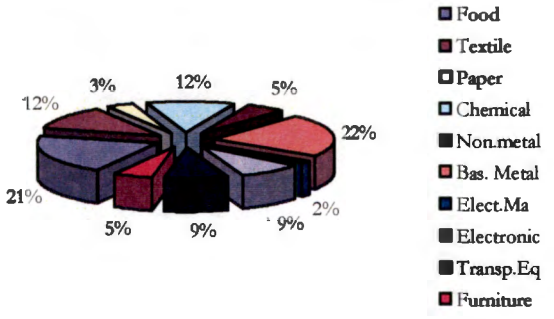
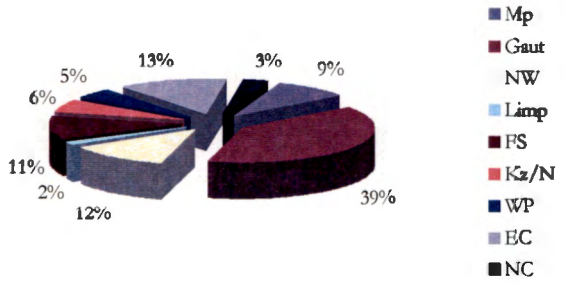


Figure 5.4 illustrates the contribution by the various sub-sectors of manufacturing. The largest response of 22.4 per cent was from the sub-sector for manufacturing products of basic metals, machinery and office equipment, followed by 20.7 per cent from food processing and beverages, 12.1 per cent by producers of chemicals, chemical products, coke, petroleum products, nuclear fuel, and products from rubber and plastic, 21.1 per cent from textiles, clothing and leather products, and 10.3 per cent came from the sub-sectors of electrical and electronic equipment taken together. As basic metal products, food processing and chemicals are major sub-sectors this response seems representative.

5.5.2.4 Location

Figure 5.5 shows the spatial response from the various provinces. From Gauteng 39.6 per cent responded, compared to 13.6 from the Eastern Cape, 12.1 from North West and 10.6 per cent from the Free State. Some firms were visited in person to complete and collect questionnaires making the response from Gauteng disproportionally higher than the other provinces. Gauteng is, however, the most important centre of manufacturing in South Africa and this might give some rationale for its large presentation.

Figure 5.5 Response from Provinces



While most firms in the survey are situated in or near Spatial Development Initiatives (SDIs), most were not aware of it. Of the respondents only 12.3 per cent indicated that they are situated in or near a SDI. This confirms the suspicion that provinces are not committed to the development of SDIs and that leadership is lacking in this regard (see Kleynhans, Naudé & Van der Merwe, 2003:25). Of the respondents 89.7 per cent believed that the introduction of SDIs or development corridors did not enhance manufacturing at their firms in any way. Only 6.3 per cent found that the introduction of SDIs or development corridors led to increasing returns and/or economies of scale in their companies.

Several manufacturers stand antagonistic towards SDIs as it increased their cost outlay, especially along the Maputo Development Corridor (MDC - N4 road) in Mpumalanga. There were substantial increases in the costs of raw materials and other supplies and the erection of tollgates increased their transport costs of firms. In several instances firms now pay to use a road that was there already and that was built with their taxes. Producers feel that the tollgates also deteriorate business and would like tollgate tariffs to decline. Some manufacturers indicated that SDIs should make secondary industries more attractive to investors but the expensiveness of the connecting routes on the MDC is scaring possible investors away.

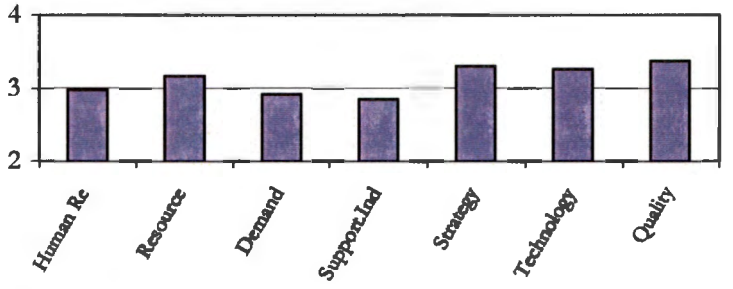
The following sections investigate the competitiveness platform of South African manufacturers by analysing the overall response of all the firms in South Africa that participated in the survey.

5.5.3 DESCRIPTIVE STATISTICS ON THE OVERALL COMPETITIVE PLATFORM

5.5.3.1 Strengths and Opportunities

It is indicated that respondents regard quality and environment, firm strategy, structure and environment, technology and innovation as the strongest points of their competitiveness platform. These are all elements, which are important for sustained competitiveness in the new global economy. The findings revealed that human capital is not the worst element of South Africa's competitive platform. The worst were related and supporting industries and institutions and demand conditions. These are characteristic of a less developed country. Figure 5.6 compares the main factors regarding the competitive strengths and investment opportunities of the respondents. A value less than three was considered to be poor, and in excess of three was good. On a five-point scale, ranging between very poor and excellent, the lowest factor namely related and supporting industries and institutions was still 2.8, indicating that even the worst factor regarding competitiveness of South African firms was still rated relatively fair by the respondents. There where, however, large standard deviations. As could be expected, the largest standard deviation was 0.75 of the factor technology and innovation. Many firms do not have the knowledge and expertise to employ

Figure 5.6: Strengths & Opportunities



modern technology, while some of the most sophisticated engineering and development are found in other firms. The following paragraphs will consider these factors of competitive strengths and investment opportunities in more detail.

Considering the ***Porter Diamond*** specifically, it will be shown below that the availability and quality of most *input factors* were found satisfactory. Some capital goods are imported at very high prices and skilled labour and managers are sometimes a problem, but the problem is not serious and shortages do not hamper production. The all over rating of human resources was poor but physical capital was seen as fair. Although most manufactures regard the quality of their production *output* to be high, inadequate *demand*

does, however, restrict production and limit economies of scale. On average, demand conditions was rated as poor. Local demand is low and only 19 per cent of the companies export more than a quarter of their products.

On the other corner of the Porter Diamond, firm *strategy, structure and rivalry* it is shown below that respondents rated their performance as fair. Managerial skills and practice was seen as ranging between fair and good. Managers have sufficient business contacts and their ability to integrate and innovative business activities are perceived to be satisfactory. Co-operation with suppliers is fair and co-operation with clients is good. Respondents were satisfied with their level of technological proficiency and rate their utilisation of technology and innovation to be satisfactory and the quality of their final products to be good.

Respondents rated *services and supporting industries and institutions* to be poor on average although joint problem solving, exchange of research and linkages in knowledge, information and technology, the share in critical activities, local suppliers, and support and co-operation from business associations are regarded as satisfactory. Considering the *four corners of the Porter Diamond,* competitiveness of South African manufacturers are therefore rated as: *inputs* range between poor and fair, *demand* conditions poor, firm *strategy, structure, rivalry and management* fair and *supporting industries and services* poor. This indicates that local manufacturing is not internationally as competitive as it should be to deliver the necessary income and employment that are needed by the economy for sustainable growth and development. The quality of human capital and the civil service needs lots of attention and demand conditions too. Demand conditions will, however, only be rectified once human capital and employment has been adequately rectified. On average, none of the corners of the *Porter Diamond* are rated as good or excellent, indicating that many improvements are still necessary to make South African firms internationally competitive, especially with regard to investment in human capital and technology.

Considering ***the measures of globalisation*** the availability and quality of *skilled labour* is low and not enough is being done to improve human capital. Only a few firms in the country enjoy *increasing returns to scale, telecommunication infrastructure* is perceived as good, while most companies utilise *cell phones* and *computers* in their production process and marketing. Several firms are *networking,* having fair business contacts and utilising their business associations and the internet. Contact with organisations and firms in other countries are, however, limited and most respondents rated this aspect as poor. International trade is still limited as 63.5 per cent of the respondents still export less than five per cent of their output to the rest of the world. It does not seem that South African firms are adequately equipped to compete in the *new economy* yet. The level of technology is fair but the supporting labour is lacking and unproductive.

The questionnaire did not ask enough to evaluate *competitive intelligence* adequately but it was noted that 84.4 per cent of the respondents have access to the internet and some knowledge and technological spill-overs are enjoyed, although it was not on average rated as sufficient. Linkages and business associations are utilised and firms rate their availability to market and product information as fair. Telecommunication services and cell phones are of good quality and utilised sufficiently. Firms use their contacts and networks although none indicated that it had a large impact on the competitiveness of their businesses and international contact is poor. Considering the data presented by the survey, the impression is that competitive intelligence is not yet high on the agenda of firms and they are not focused to enhance their competitivity using the information about products, technology, production processing, the market and their competitors adequately.

The *Globalisation Index* of AT Kearney, discussed in section 5.2 above, consider economic integration, personal contact, technology and political engagements in an international context. The questionnaire did not consider all these aspects. Some *internationalisation* is developing as companies are moving to improve their international competitiveness and starting to export their products. The scale and extend thereof is still limited. On average the level of technology is sufficient but not regarded as good or excellent. Only a few companies have international contacts. As it is still limited and firms are not depended thereon, import of inputs does not affect the competitiveness of local firms, although some respondents complained about the high price of imported capital goods. Export opportunities were not seen to be good. Opportunities to the Western world were rated as fair but to Africa and the Middle East it was poor. Respondents did, however, indicate that they have a fair ability to enter foreign markets and grow profits. Harbour and airline facilities, the availability of ocean freight, cold storage and time consumed at border posts, import tariffs and other international trade restrictions do also retard international globalisation. Respondents also do not think that the situation will change in the near future and they do not think that the volume of goods imported or exported or the level of investment in machinery and equipment will change during the next twelfth months. International contact with organisations and firms are poor and the volume of exports small compared to total production, limiting *personal contact.* Most companies do have access to e-mail, the internet, cell phones, computers and other modern communication technology implying that their *technological* capabilities are sufficient. Firms also rated their technological efficiency and engineering expertise to be fair but not good enough to be internationally competitive. On *political engagements* no questions were asked in the questionnaire. Respondents did indicate that they regard political and policy stability in South Africa to be poor and not conducive to international competitiveness, but this is limited to local competitiveness and did not include political and trade missions and delicates to and from foreign

countries, which the Globalisation Index considers. The conclusion is thus that although the questionnaire did not gather enough data to calculate a globalisation index, the facts that were presented by the survey revealed that South Africa would probably be very low on the scale of globalisation.

The industrial competitive platform comprises more aspects than the four corners of the *Porter Diamond* and the following sections will provide more detail information, which the survey revealed.

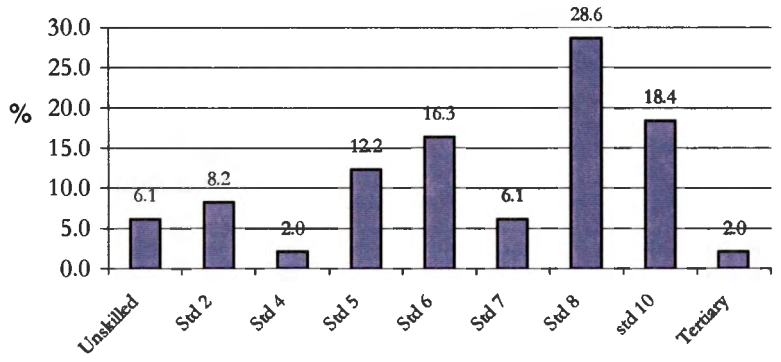
5.5.3.2 Human Resources

Manufacturers perceive the quality and availability of human resources to be between poor and fair. The availability of unskilled labour is as can be expected fairly well, and that of artisans, technical and managerial staff is fair. Very few rated the availability of any labour component as being very poor. The worst rating was that of civil servants that is regarded as poor with a standard deviation of only 0.9 on a five-point scale and none of the respondents viewed them as being very efficient. There is also a significant shortage of artisans. Most respondents regard wage rates, unit labour costs and workplace regulations to be fair, while their perception of the work ethics of the labour force and *productivity* is poor, declining the competitivity of firms. Respondents do not expect the average working hours per factory worker, the average total cost per unit of production or the average labour cost per unit of production to change in the near future.

Some respondents expressed concern against the growing power of trade unions. Some manufacturers regard the current labour laws as being "draconian", which together with affirmative equity laws, are onerous and unfriendly towards industrial development and needs to be addressed. Labour laws are making it difficult for small businesses to control their own businesses and remain competitive. Healthier labour relations with manufacturers and deregulation of employment practices are asked for. Current labour legislation is not seen as an incentive to employ more people, but increases unemployment (this perception is also expressed in current literature; see e.g. Maziya, 2001:211). It is suggested that the skills development levy should be cancelled as firms can effectively only claim fifteen per cent of the levy back. Respondents also suggested that annual wage increases should be linked to the geographical area. The educational level of labour in general should be improved. The low levels of literacy restrict the trainability of most unskilled workers. People should also be trained to acquire quality skills. Development of workers skills should receive more attention and the authorities may consider the sub-contracting of private developers.

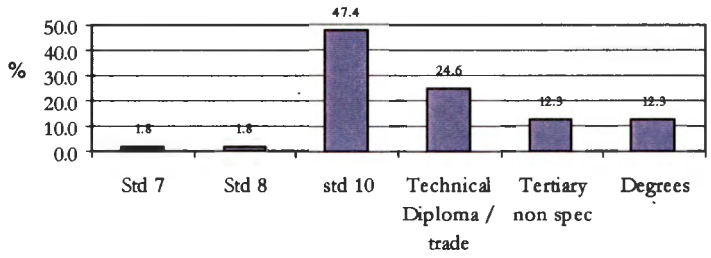
The *educational level* of unskilled labour in the sample is shown in figure 5.7. The highest level is on average ten years of school education and only 6.1 per cent of the firms employ mostly workers that are totally illiterate. Nearly half (49%) of the unskilled workers have ten years or more, which are far higher than would have been expected.

Figure 5.7 Education of Unskilled labourers



On the other hand the average level of education to among skilled personal is not very high. Figure 5.8 shows the average level of education among skilled labourers in the firms studied. Nearly half (47.4%) of the workers in this category have only matric and about a quarter (24.6%) has technical diplomas or are skilled artisans. Twelve per cent have degrees and another 12.3 per cent tertiary training of some sort although those respondents did not specify.

Figure 5.8 Qualifications of Skilled Personal



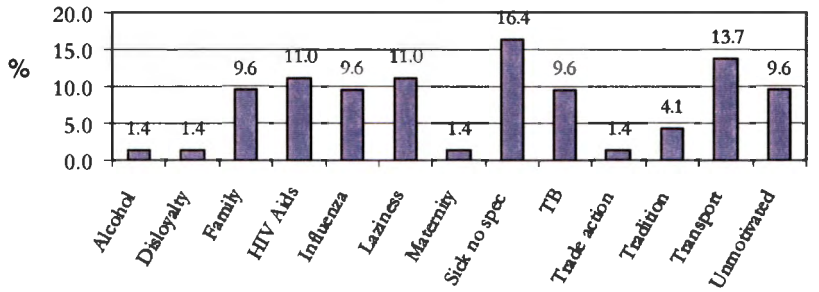
Main reasons why employees are *absent from work* is illness, but that was unfortunately not specified. Figure 5.9 shows the main reasons why workers are absent. The largest reason following unspecified illness is problems with transport and then HIV/AIDS. Many of the other reported illnesses could also be AIDS

related. Influenza and TB respectively were both given by 9.6 per cent of the manufacturers as major reasons for absentees. Respondents viewed low work ethics as an important factor causing absentees, 9.6 per cent saw workers being unmotivated as a major reason for absentees and another eleven per cent explicitly named laziness and 1.4 per cent disloyalty as major reasons. On the specific questions on work ethics and productivity, most employers rated it as being poor, although some manufacturers also have excellent motivated and productive workers. Manufacturing labour is, however, newer rated so inefficient as civil servants. Although family responsibilities was only seen as a major problem by about ten pre cent of the respondents, tradition was only in 4.1 per cent of the cases a major cause of absentees and trade action was only in 1.4 per cent of the firms a major reason for absentees.

Continued investment, development and upgrading of *human capital* are crucial to obtain and expand competitiveness. On average, respondents view the vocational and industry related training facilities in South Africa to be poor.

On average, respondents rate the *social infrastructure* near their premises to be fair but rated the availability of health services to be poor. This probably implies that they feel satisfied with their social infrastructure but view the availability of medical assistance to their employees to be insufficient. The availability of schools, colleges, universities and other industrial training facilities near the premises of manufacturers is a problem creating problems to obtain skilled labour. They are satisfied with their managerial skills and practices, but feel that the proximity of professional services is in most cases inadequate.

Figure 5.9 Absent from Work



5.5.3.3 Other Resources

Considering *resources* and *infrastructure,* telecommunication services were regarded as the best advantage point with a standard deviation of only 0.99 on a five point scale, followed by the level of development of South Africa's financial and banking sector, the application of modern technology, and the availability of

land. Scientific transport is seen as being poor and none of the respondents perceived it to be very good. None of the factors concerning resources were, however, perceived on average to be good or very good. The biggest problem was seen to be at border posts and harbours, the sea transport network, air transport, and import of inputs. Most factors influencing resources was seen to be fair, including business association support, information, the availability and cost of capital, project development, financial support, access to finance, cost and reliability of electrical supply, road and rail networks, and the social infrastructure of the country, which includes schools and medical facilities.

Access to *finance*, the availability of capital and the cost thereof are seen as fair. The same applies to project development and financial support. On average, the availability of finance is not an obstacle to South African firms. The level of development of the financial and banking sector, including corporate financial services, are regarded between fair and good. Respondents believe that probable risks do exist for investment in the country, and government incentives to promote investment are inadequate. For these reasons investments from abroad are also very low and they do not expect the situation to change in the near future. This does not, however, lead towards unreasonably high costs for credit

Respondents rated most *locational aspects of their premises* to be poor. The worst factor was the availability of harbour facilities and with that the availability of ocean freight services. This was probably because such a large proportion of respondents were situated in Gauteng and other inland provinces. Other locational aspects that are most unsatisfactory include International airport facilities, the availability of cold storage facilities, the proximity of raw and semi-processed materials, and the availability of intermediate inputs and lack of foreign investment. As mentioned above the role and efficiency of government is also most unsatisfactory. Government aid and incentives are regarded as failing, import tariffs and other international trade restrictions are most unsatisfactory and so are political and policy stability. The strongest locational aspects concerning their premises are their proximity to main road links and the availability of main courier services. The reliability and quality of water supply and other utilities are regarded as excellent, although the cost of water, electricity, telecommunication services and other utilities are considered to be too high.

Both traditional *factors of location* and modern factors are considered to be poor relating to the location of the premises of respondents. Neither factors like proximity of markets, low taxes, the availability of land, financial and trucking services, nor modern factors like the proximity of support services, the availability of skilled labour and industrial training facilities are seen as enhancing their efficiency and competitiveness due to their location.

Flexible production is present to some extent indicating linkages between firms and the usage of *intermediate inputs* (see section 3.3 and 3.4). Critical activities are shared, indicating co-operation in the value chain, and sub-contracting with other manufacturers highlights the importance of related industries in the *industrial districts* and clusters. Government policies like SDIs and IDZs have little effect on manufacturers in obtaining increasing returns and economies of scale as only 6.3 per cent of the respondents enjoyed any positive advantage due to this.

Elements typical to *flexible production*, like various linkages and sub-contacting, the continuous upgrading of input and production processes and shorter production runs are increasingly indicating that manufacturers are gradually moving towards modern manufacturing practices which could eventually make them internationally competitive and able to compete in the new global economy. Sufficient investment in new technology is taking place; specialisation in the production of specific components and phases of the production process is growing, while firms are becoming increasingly dependent on related industries and services in the industrial district or virtual districts in their computer network of contacts. Support services, business associations and social infrastructure, and the scope available in industrial districts and networks are becoming more important. Only about a third of the firms are producing the entire product from raw to final product, indicating the extent of flexible production taking place. Manufacturers do, however, still experience problems with the proximity of semi-processed materials and the availability of intermediate inputs are regarded as poor.

Of the respondents 67.7 per cent manufactured the complete product and 37.3 per cent indicated that they only specialise in the manufacturing of a part or phase of the final product. This indicates that about a third of the manufacturers are to some extent involved in *flexible production* and utilise other supporting industries and intermediate inputs in the industrial districts. Respondents also identified several potential industries that could settle in their vicinity due to possible forward and backward linkages.

5.5.3.4 Demand Conditions

Demand conditions manufacturers in South Africa face are on average seen as poor. Respondents perceive the best factors concerning demand to be market or sales price, but as it is the prices they set, this factor should not be over emphasised. Other factors seen as fair are the size of the local market, the structure of local demand and consumer sophistication, export opportunities, market differentiation and saturation. No demand factors were considered to be good or excellent. The poorest demand factors were contributed to

HIV/AIDS and low government demand. Other factors that were considered to be the cause of demand problems were population growth and poor export opportunities to Africa and the Middle East.

5.5.3.5 Related and Supporting Industries and Institutions

Most related and supporting industries and institutions in South Africa are perceived by manufacturers to be poor. Especially government competence, policies and interventions, and the quality of legal institutions retard local competitiveness. Sub-contracting with other manufacturers is poor, as is their co-operation with competitors. Contact with organisations and firms in other countries are poor, but membership of local business associations is seen as beneficial. Co-operation in the value chain is seen as fair where critical activities are shared and so are local suppliers and linkages to technology, access to information, exchange of research, and joint solving of problems.

Some manufacturers suggested that the government should support manufacturing much more, especially through direct measures. There is a need for more incentives to local manufacturing. Some asked for subsidies on transport and wages, like those that existed in the past (see chapter 4 section 4.3). Concessions on rental and company taxes, or at least reduced company taxes, are also requested. Discount on local content tenders could be considered. Others advocated that government and other bodies should strive towards the utilisation of synergy between mining, industries, trade as well as other strategies and policies. More should be done to promote exports, training and manpower development. Attention should also be given to local value added services such as consultants, design, building, education and maintenance. The intended transfer of mineral rights and land reform policies are seen as a deterrent to new investment, and so are the politics of the South and Southern African governments and the level of crime. Support to neighbouring countries should be terminated and those funds rather used to create development in South Africa itself where needed, like in agriculture and agro-agriculture. The black empowerment programs are seen as restricting industrial expansion and investment and some manufacturers suggested that it should be suspended. Trade union demands and other rising costs present other countries like China with opportunities to compete favourable on the South African market, especially with labour intensive business. Local manufacturers therefore plead for a surcharge on import based on the difference in variable costs such as labour energy and transport. A national drive towards awareness of and commitment to productivity to increase international competitiveness was suggested including training courses, advertising, propaganda and a national productivity day.

There were respondents requesting the development of improved *infrastructure* and roads that can handle high volumes of heavy traffic. Lower tollgate fees, improved railway and airport facilities, and lower fuel prices that could enhance manufacturing. Decentralisation further from cities and metropoles (at about a 100 km range) could be to the advantage of both cities and smaller towns. Local development could be promoted through lower municipal rates and cost charges. Reduced basic charges on water, electricity and rent and ensured continued reliable supply of electricity and telephone services were suggested. It is suggested that by ensuring the satisfaction, happiness, and content of those manufacturers that are already functioning in the country, would be the best way of attracting foreign direct investment and growth in the country.

It seems that the local market in South Africa is less developed when market and demand conditions, the sophistication of consumers and the economic climate are considered. When competitiveness is considered from the supply side, marketing, production management, innovation and technology from the position of local manufacturers in the South African market are seen as much more sophisticated as commonly assumed. While respondents perceived most of the above factors to be poor the factors concerning firm strategy, technology and the environment were seen to be more conducive to the competitive position of firms.

The *New Economic Geography* emphasises a pool of skilled, intermediate inputs, knowledge and technological spill-overs as the most important factors of industrial location (see chapter 3 section 3.3). Regarding *locational aspects of their premises* respondents on average rated the availability of skilled labour and training facilities to be poor. The availability of subcontractors, proximity to suppliers of spare parts, and proximity of semi-processed material and/or intermediate inputs are regarded to be very poor Proximity of professional and support services are poor and the availability of other manufacturing industries in the industrial districts and business support services are also rated as poor. None of the main factors identified as important are rated by respondents as fair, good or superior in relation to the location of their premises.

Business and supporting industries and institutions do have some positive influence on the competitiveness of manufacturers (see chapter 3 section 3.3 & 3.4). Respondents rated their business contacts and the support from trade and business associations as having a fair influence on their competitivity in the industrial districts. Maintenance and support services do not hamper activities and manufacturers do not think it will in the near future. The utilisation of *technological and knowledge spill-overs* are seen as being poor, decreasing the advantages of *agglomeration* in industrial districts. Although some linkages, including some linkages to technology and information, exist and flexible production does occur, *economies of scope* is not yet

satisfactorily developed in most industrial districts to enjoy the advantages that agglomeration has to offer. The availability of technology and knowledge support services are, however, not hampering activities and manufacturers do not think that it would in the near future. The telecommunication services in South Africa are rated between fair and good, standing out, together with the provision of electricity, water and other utilities, to be better than most of the other supporting services. The road and rail network are regarded as being fair but air and sea transport and traffic at border posts and harbours are seen as poor and not conducive to competitiveness of industries.

Concerning *transport costs* the road and rail network do not present major obstacles to the competitiveness of firms while air and sea transport and traffic at the boarder and harbour posts do. As most of the manufacturers are landlocked in Gauteng, availability of harbour facilities is a problem pushing costs up, but with a well-developed road network in South Africa this is not always a serious problem. Costs and availability associated with trucking services are seen as a cost factor to respondents, as do the proximity to national airports

5.5.3.6 Firm Strategy, Structure and Rivalry

Co-operation with competitors was seen to be poor but all other factors relating to firm strategy, structure, and rivalry in the South African economy were perceived by the respondents to be fair to good. As businesses usually try to please their customers, respondents saw co-operation with clients to be the strongest factor. Other factors that were seen to be between fair and good were co-operation with suppliers, managerial practice, and managerial skills in the integration and innovation of business activities, employee performance incentives and business contacts. The ability of firms to enter foreign markets, their growth in exports, and profits were also seen as being satisfactory.

Respondents rate the availability of managerial staff as being poor but rate the abilities of management to be on average higher than that of other labour and contributing towards higher competitivity. Management is competent and has goods contacts leading to strategic positioning in the market competing successfully with rivals.

5.5.3.7 Technology and Innovation

Respondents generally perceive their *utilisation of technology and innovation* to be fairly efficient and much better than would be expected from a less developed country. As co-operation with competitors and

supporting services was seen to be poor, technological and knowledge spill-overs from other firms are not utilised sufficiently in South Africa. There were, however, 26.6 per cent of the respondents that rated their utilisation of such spill-overs as good or excellent. The strongest factors enhancing competitiveness related to technology and innovation are the use of cellular phones and other similar modern communication technology, investment in new production technology and new innovations within the firm. Other factors that are seen as fair contributors to competitiveness are their innovative application of existing and new technology, research within firms creating innovations and new technology, the upgrading of their production mix, and the use of computers in their production processes. Of the responding firms, 48.4 per cent utilise computers in the production process well to excellent, and 51.7 per cent rated their upgrading of their input or production mix between good and excellent. A total of 37.8 per cent of the respondents rated the research that is conducted within their firms creating innovations and new technology between fair and excellent. A fair number of firms utilise computers and the internet and at least 84.4 per cent of the respondents have e-mail addresses. The manufacturing sector in South Africa seems to be rather well developed when their level and usage of technology and innovation are considered. The same is found when the quality of inputs and products are considered.

In an effort to become and remain competitive, capability and capacity in the acquisition and utilisation of technology should *continually expand and improve*. Respondents rate research facilities, resources, and support services to be fair and their application of modern technology range between fair and good, but the county's scientific infrastructure is poor and only a few would rate it as fair or good, and no manufacturer perceives it to be excellent in South Africa, or at least in the sample considered. As the share of critical activities do take place to some extent, respondents view the existing linkages to technology, their access to information, exchange of research, and joint solving of problems to be fair. On the other hand, their average response to the question on the utilisation of technological and knowledge spill-overs from other firms were rated to be poor to fair. They do utilise modern technology and computers, invest a fair amount on new production technology and *upgrading* of their input, and/or production mix occurs fairly often.

Respondents also indicated that a fair amount of research is taking place within firms creating *innovations* and new technology. New and existing technology are often applied in new innovative ways and adopted to their needs, but these innovations are seldom registered as new patents; probably because the development of new technology is not considered to be their main business.

5.5.3.8 Quality and Environment

Manufacturers regard the quality of material inputs and the quality of their production outputs both for the local and the export market ranging between satisfactory and good. The costs of compliance with quality standards as well as to environmental legislation are seen to be fair and their amount of pollution emitted to be reasonable to good. This makes the country an attractive venue to locate investment and development from abroad. Respondents did, however, perceive environmental protection legislation and guidelines to be unclear.

5.5.3.9 Perceptions and Expectations of Business Conditions and Costs

On average, respondents saw their activities to be about equal to that of the same quarter a year ago and expect it to remain the same and only decline very slightly if at all. They did, however, expect sale volumes to decline during the following quarter. Respondents do not perceive Local sale volumes, production output, fixed output, or general business conditions to improve in the near future. Business conditions were rated satisfactory by 67.7 per cent of the respondents and 70.8 per cent believed that it would remain satisfactory during the following quarter. Compared to the same quarter a year ago, current stock of raw materials relative to planned production, and also finished goods relative to expected total demand, were regarded as sufficient and respondents expect it to remain so. Delivery time of orders is also improving and respondents expect the trend to continue.

About 61.5 per cent of the manufacturers produce below capacity and they expect this trend to persist during the next quarter. Production and other costs are regarded to be the same as a year ago and where prices increased, it is only slightly. Respondents believed that this would also be the case in the near future. Average total cost and average labour cost per unit is about the same as a year ago and it is considered to remain so or decline very slightly. The same goes for the average purchasing price of raw materials, the average local and export sales price per unit of production, and taxes paid as percentage of sales. The survey was, however, conducted before the disappointing high inflation figures for South Africa were released during the second half of 2002. As could be expected, respondents were not satisfied with the levels and structures of rates and taxes and they do not expect the situation to change in the near future.

On average, respondents consider volumes of exported goods to increase very slightly, but volumes of imports, investment in machinery, equipment, and new capacity are expected to remain constant during the following year. Investment in land and buildings are, however, expected to decline during the next

twelve months. The only factors that are likely to limit the ability of manufacturers to invest during the following twelve months are insufficient product demand, the cost of credit and to a lesser extent tax structures. The availability of credit, access to raw materials and a lack of managerial skills and investment support are not considered to be hampering producer's ability to invest during the following year.

Obstacles that hamper production are very few and most respondents view the situation being constant during the past year. On questions regarding shortages that hampered their activities on a three-point scale the standard deviations when comparing activities to a year ago was about 0.35 while answers to the current situation had standard deviations of about 0.8. This indicate that most respondents agree that the situation did not change significantly during the past year. Respondents do, however, differ much more concerning their current situation. The most important aspect hampering their activities is shortages of raw material, followed by shortages of skilled labour, machinery and equipment, maintenance and supporting services. Availability of unskilled labour, water, electricity and other utilities present the least problems. Competition from other firms has improved slightly and producers perceived the availability of packaging and marketing material as well as technology and knowledge support services to have improved slightly during the past year.

Among other *factors hampering activities* of manufacturers the most important factors are the:

- High interest rates, especially the level of short-term interest rates
- Availability of medium-term finance
- Insufficient demand for their products and
- Municipal levies, taxes and permit costs.

Most *institutional factors* influencing business activities of producers deteriorated during the past year. These factors include:

- A non co-operative civil service
- Municipal levies, taxes and permit costs
- Bribery and corruption
- Interpretation of tax laws
- Import dumping and
- International trade restrictions and barriers.

What was especially noteworthy was the unfavourable perception, which nearly all respondents have of the *government and civil service*. Reponses were in all cases remarkably more negative on these issues. Civil servants

are viewed as inefficient, government demand and procurement from local manufacturers low, government support is not competent, government policies and interventions are viewed as poor and even legal institutions range between poor and fair. Companies feel that government incentives and aid from government are very poor and no respondent rated this as being excellent. This also applies to political aspects and policies, which are perceived as being very poor and decreasing competitiveness. Respondents also expect this situation to deteriorate in the near future. Co-operation with the government and workplace regulations are, however, perceived as fair.

Some manufacturers indicated that their possibilities to expand activities depend on demand conditions in the commodity markets. Most respondents indicated that they might consider expansion of their activities in four to five years time and most considered only expansion on their current site.

The following section will consider to what extent competitiveness differ with the size of Firms. The empirical analysis was similar to that done above, but now the sample was divided in to three groups: small, medium and large firms, and the competitiveness of each were investigated.

5.5.4 COMPETITIVENESS ACCORDING TO DIFFERENCE IN FIRM-SIZE: EMPIRICAL RESULTS

Some of the basic characteristics of the responding firms differentiated according to the size of firms are presented in table 5.6. The results confirm mostly what would be expected and thus confirm the reliability of the data in general. Only small firms have an annual turnover of less than five million Rand, their annual overhead costs are far less than larger firms, small firms utilise less skilled labour and less advanced technology. Only the largest firms export more than five per cent of their annual turnover and firm size expand over time. The age of the largest responding firms averaged 45 years, ranging between four and 105 years, while the average age of medium size firms are 24 per cent. Surprisingly, there are some of the smallest firms that are older than a century. None of the medium or large firms are younger than four years. Medium firms are the group that is mostly active in flexible production. Small firms probably do not have enough networks and contacts to rely on other companies for intermediate input, and larger firms are large enough to manufacture the whole product themselves. More than a third of all firms are, however, specialising and processes only a part of the final product and also provide supporting services in the production process. This is an indication that technology in South Africa is not as undeveloped as in other

African countries, and confirms what was said above regarding the current level of industrial development in South Africa.

It can be assumed that large firms are better informed and the questionnaire confirmed that, as 23.5 per cent of the large firms knew about the SDIs in their vicinity compared to only 3.3 per cent of the small firms. Larger firms are also in a better position to make use of the incentives and advantages which development and government initiatives offer. As shown in table 5.6 for instance, SDI development did not enhance production in small firms, while about half of those medium size firms that knew about SDIs indicated that it enhanced their production and 66.7 per cent of the largest firms. This also applied to increasing returns and economies of scale resulting from SDIs. It had no effect on small companies, advanced 33.3 per cent of the medium size firms and a quarter of the largest firms.

Table 5.6: Competitiveness According to Firms-Size

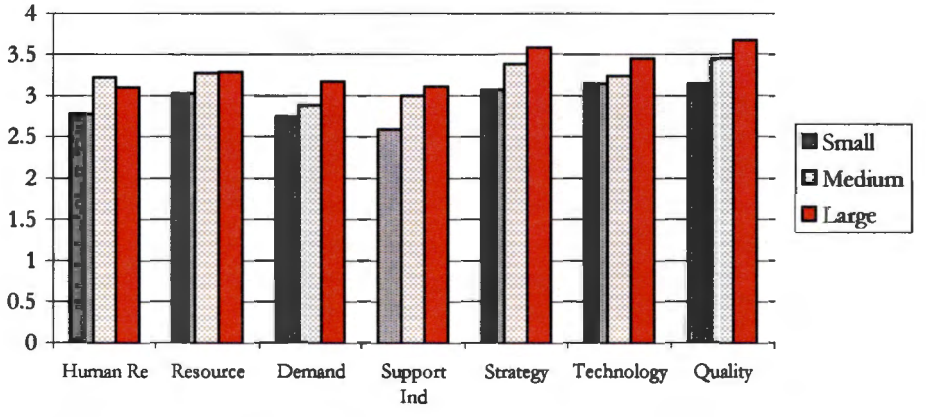
Item	Small	Medium	Large Firms
Number of Employees	< 50	50 - 250	> 250
Annual Turnover (R mil.)	1-5	> 10	> 10
Ave. Annual Overhead Costs (R mil.)	1.3	12.9	55.4
Foreign Trade as % of Turnover	< 5	< 5	5 - 25
Firm Age	27	24	45
Any Knowledge of SDIs (% of firms)	3.3	14.3	23.5
Production Enhanced by SDIs (%)	0	50	66.7
Increasing Returns due to SDIs (%)	0	33.3	25
Flexible Production (% of firms)	34.6	46.2	35.3
Internet Address (% of firms)	70	100	94.1
Human Resources (Scale 1-5)	2.77	3.22	2.97
Level of Technology & Innovation (1-5)	3.14	3.24	3.25
Expansion Possibility (years)	4 - 5	1 - 3	1 - 3

The fact that less than 24 per cent of the largest firms do not know about the SDIs in their vicinity might indicate poor competitive intelligence in South African industries. This confirms what was noted above. The level and utilisation of modern technology is, however, sufficient to sustain development and it probably confirms the unfavourable perception of respondents relating to the public sector, its inability to disseminate information, and a lack of efficient communication.

Figure 5.10 show the main factors of competitiveness that was surveyed according to firm size. As in the discussions above, respondents answered on a five-point scale ranging from very poor (1), to excellent (5) and fair (3) in the middle. As can be seen on the graph, larger firms are more competitive. On all factors

competitiveness grew with firm size, except human resources. Smaller firms are more labour intensive and this might be the reason why the largest companies are not so competitive when human capital is considered. Demand for skilled and specialised labour increases as firm size increases and this might also be a reason why respondents of the largest firms rate the quality of their labour input as less efficient. Larger companies can achieve scale economies, as they are more efficient and more competitive.

Figure 5.10: Competitiveness and Firm Size



5.5.4.1 Competitiveness and the Size of Firms

Small firms rate all aspects of their ***human capital*** to be poor. The only aspects that are satisfactory are the availability of unskilled workers and workplace regulations. The worst aspects are the efficiency of civil servants, which none rated as excellent, followed by a shortage of managerial staff and artisans and industry related training facilities. *Medium sized firms* also experienced problems with the inefficient civil service and inadequate training facilities, but also with the work ethics of the workforce that are unmotivated, neglected and not conscientious. The respondents of medium sized firms rated all other factors relating to human capital as fair. *Large companies* also found inefficient civil servants to be their greatest obstacle to competitiveness when considering human capital, followed by high unit costs per worker. Other factors were all satisfactory and the best factor was the availability of unskilled labour.

Table 5.7 shows the Overhead cost per labourer of the responding firms. From the table it can be seen that the overhead per worker in smaller firms are higher and declines with firm size. This might be because larger firms have more employees. This might suggest that smaller firms are not so productive; it also

correlates with the productivity indices of table 5.17, which indicates that productivity rises with firm size. It is, however, doubted that the overhead cost per labourer could be interpreted as a measure of productivity as fewer people have to handle more overheads in smaller firms.

Table 5.7: Overhead Cost per labourer

Provinces		Sub-Sectors		Firm Size	
KwaZulu Natal	312167	Food	121967	Large	37757
North West	106432	Textiles	154167	Medium	116896
Mpumalanga	35714	Paper & Wood	23963	Small	128837
Eastern Cape	69461	Chemicals	56071		
Gauteng	44919	Non-Metal Min	5939		
Northern Cape	1648	Basic Metal Prod	214101		
Free State	352450	Electrical	28571		
Western Cape	45802	Electronics	34994		
Limpopo	23963	Transport	112480		
		Furniture	139048		
Total Sample: 109316					

Other Resources like all other factors excluding human capital, competitivity rises with firm size. All firms rated the high quality and reliability of the telecommunication services as the most important factor enhancing their competitivity. The cost and reliability of electricity supply and the availability of suitable of land are also rated as very import. The cost of capital (including price and the impact of interest rates and the exchange rate) has a large impact on *small firms* as well as the sea transport network and traffic at harbour and boarder posts.

Medium *size firms* also consider the level of development of the financial and banking sectors, the availability and quality of research facilities, resources and support services, the application of modern technology and market and product information as factors that have an important impact on their competitivity. Aspects that retard their competitivity are also the costs involved in the importation of inputs, the sea transport network and traffic at harbours and boarder posts.

Next to telecommunication and electricity, information on products and markets, as well as the application of modern technology have the largest impact on the competitiveness of *large firms*. Respondents of large firms rated the air transport network and transport at border posts and harbours as their biggest obstacles when considering resources. Scientific infrastructure and research facilities and support services were rated as fair but not sufficient. Social infrastructure, sea transport, trade and business association support also rated very low although not unsatisfactory, implying that there is room for improvement.

As can be seen on figure 5.10 most respondents rated ***demand conditions*** very low, especially in the small and medium enterprises. Small firms rated all factors related to demand as poor, medium size firms rated export opportunities as poor, as well as HIV/AIDS and government demand. Large firms regarded all demand factors to be satisfactory except government demand, population growth and HIV/AIDS, which have a negative effect on their competitiveness. Large firms regarded export opportunities, the size of the local market and market sale prices as the demand factors that enhance their competitivity the most.

As can be seen on figure 5.10 respondents rated ***related and supporting industries and institutions*** just as low as demand factors. As could have been expected from the facts given above, the low perception that respondents have of government competence, interventions, and policies was the main reason why support services are rated so low. The effective differences between the response of small and large firms yield a Cohen's d-value of 1.55 for supporting services and institutions, indicating that the differences are of practical significance. Small firms only rated linkages to technology, access to information and exchange of research and joint problem solving as fair, as all other firms did too. All other factors relating to support services that could enhance small firm's economies of scope were rated as poor. Medium and large firms also rated the quality of legal institutions and membership of business association as inefficient. Like the smallest firms the largest companies also had problems utilising support services. Dependence on imports for consumer, intermediate, and capital goods presented a large obstacle to all firms but were rated as worst by the largest firms. Large firms regarded local supplies and linkages to technology as fair.

As can be seen, firms regard their ***strategy and management*** as more competitive than the previous factors noted above. *Large firms* rated their managerial skills in integration and innovation of business activities and their co-operation with clients to be good. Managerial skills, business contacts, co-operation with suppliers, the ability to enter foreign markets and export growth were also rated high ranging between fair and good.

Medium sized firms rated their co-operation with supplies and clients as the strongest factors that enhance their competitivity and their ability to enter foreign markets and growth in exports as their weakest. All other aspects related to ***strategy, management, structure and rivalry*** are rated as fair. None of the factors considered in this category was rated as good by *small firms*. Their strongest assets rated as fair were co-operation with clients and managerial skills and practices. With a Cohen's d-value of 0.79 it can be assumed that the differences between large and small firms are of practical significance.

Respondents rated most factors regarding ***technological and innovation*** as fair. Although *large firms* have many innovations and find several innovative applications for the technology, new patents are rarely developed and registered. This is the only factor regarded as poor by large companies concerning technology. The strongest factors enhancing competitivity of large companies are the continues upgrading of their technology, input and production mix, their utilisation of computers in the production process and their use of cell phones and other modern communication technology. On all aspects the standard deviation on the answers of respondents from large firms were less than one, answering on a five-point scale, indicating that the level of technology and innovation in large firms are about the same.

Medium size firms see their use of cell phones, modern communication technology and new innovations within their firms as their most competitive elements regarding their competitiveness ranging from very satisfactory to good. Respondents also regarded their use of computer technology in the production processes and the continues upgrading of their production processes as satisfactory. New patents are rarely further developed and registered in *medium* and *small* firms, they conduct very little research and utilisation of technology and knowledge spill-overs from other firms are seldom enjoyed.

Other technological factors that are poorly rated by *small firms* are their use of computers in the production process and efficient utilisation of the internet. No factors are rated as good. Their strongest points are the utilisation of new innovations within the firm and use of cell phones.

All manufacturers rate the ***quality*** of their products as good. The quality of input production factors ranges between satisfactory in small firms to good in the largest firms. This is probably because larger firms can afford to buy better quality resources. The difference between small and large firms is of practical significance with a Cohen's d-value of 1.49. The quality of products exported also shows the same trend ranging from satisfactory in small firms to good in the medium and large firms. This responses might also be interpreted that smaller firms do not rate the impact that the quality of exports have on their exports as being significant, as only 7.2 per cent of the small firms exports more than half of their output.

Regarding the ***Environment,*** manufacturers do not see their levels of pollutants in their productions processes as a serious risk in the environment, although larger companies do pollute more and it costs those more to comply with the standards that are set. Compliance to those standards does, however, cost medium sized firms more. All firms regard legislation regarding the environment as unclear and the cost of compliance with that legislation in general rises with the size of the firms.

As with most other factors the quality of the ***location of their premises*** rises with firm size. *Large firms* consider the quality and availability of water as the most important advantage of their locations followed by the reliability of the electrical supply, and the availability of courier, trucking, corporate finance and health services. The poorest locational aspects are the lack of cold storage, proximity of semi-processed materials and the proximity, costs and quality of international airport facilities. As with all other firms one of the biggest obstacles to competitiveness regarding location is the low quality, efficiency and availability of government incentives, aid, support, tariffs, international trade restrictions and the inefficiency of the civil service. Business support services and investment from abroad are also poor.

Locational aspects considered to enhance the competitivity of *medium sized firms* the most and regarded between good and excellent were their proximity to main road links, and the availability of courier and financial services. Other factors rated as good were the reliability of the water and electrical supply and their personal contact with customers. As most respondents were from landlocked provinces, all regarded the availability of harbour facilities and ocean freight services as poor and small and medium regarded it as totally failing. As could be expected, there was a large standard deviation on this question as most companies do not export and some are near the sea. All companies have problems with cold storage, the quality and support from the public authorities, and insufficient investment from abroad. Other factors rated as poor by the respondents of medium size firms were the availability and proximity of raw and semi-processed materials and intermediate inputs, business support services and other manufacturing firms in the industrial districts. This indicates a lack of the most important locational aspects emphasised by the new economic geography.

The strongest locational aspects of *small firms* are their proximity to main road links and the reliability and quality of telecommunication, water, electricity, and other utilities. Other aspects that were rated as most satisfactory were the availability of trucking and courier services. All firms find labour cost to be a fair obstacle, to small firms this is a little bit higher, but there are no significant differences between firms of different sizes. Small firms experience investment from abroad, import tariffs and other international trade

restrictions as failing with regard to their location and competitiveness. Following their frustration with government support and services, the poorest factors related to location are the distance from airports, the unavailability of industrial land, proximity to suppliers of spare parts and availability of intermediate inputs.

Large and medium firms regard ***business conditions*** as satisfactory and do not expect it to worsen in the near future. Business conditions are, however, not satisfactory to small firms and they also regard political and policy stability in South Africa to be poor. They also do not ***expect*** that the situation will change in the near future. All firms produce below capacity, all believe that their delivery times will improve in future and none believe that their sales or costs will rise significantly. The largest cost factor is the average purchasing unit price of raw material. This is higher in small firms than large firms, but highest in medium sized firms and most expect costs to remain constant but some believe it will rise.

Shortages hamper production of the larges firms more than small firms, although small firms expect the availability of all factors to deteriorate in the near future. Small firms have a slight problem with the availability of raw materials and medium size firms shortages of machinery and equipment. The factors of which large companies are experiencing a slight shortage of are skilled labour, managerial staff, raw materials, machinery and equipment and technology and knowledge support services. Medium sized firms expect utilities (excluding water and electricity) and the availability of machinery, equipment and technology and knowledge support services to decline in future. The only factors that large companies expect to decline in future are electricity and the availability of factory workers, including skilled labour, probably due to the effect of HIV/AIDS.

Insufficient demand, short-term interest rates and municipal levies, taxes and permit costs presents a slight ***obstacle*** to small firms and they ***expect*** the situation to decline further in future. These factors, together with a non co-operative civil service also present a retarding influence on medium sized firms who also expect the situation to decline. Next to these factors the largest firms also experience problems with the availability of medium term finance and import and export restrictions and barriers. They also expect these factors to deteriorate in the near future. Some of the replies from respondents are, however, contradictory. Large firms rated business conditions as satisfactory and they do not expect it to change during the following quarter. On the question concerning their expectations of general business conditions in twelve month's time they rated that it would deteriorate. The difference is probably because they expect business conditions to remain constant in the medium term but get worse in the long run.

In the following section competitiveness indices that were calculated according to the size of firms will be considered in order to learn more about the relative competitiveness of the various firm-sizes.

5.5.4.2 Competitiveness Index According to the Size of Firms

Competitiveness indices were calculated according to the size of manufacturing firms and listed in tables 5.8 and 5.9. The methodology was discussed in section 1.7.2 of chapter 1. In accordance with the analysis of the questionnaire above, the ranking according to the competitiveness indexes also correlated with firm size, as larger firms are more competitive, as shown in table 9.8. On internationalisation, management, science and technology large firms are the most competitive. A productivity index was also compiled and according to table 5.17 productivity also correlated with firm size. Medium firms are, however, the top performers in the categories of local economy, government, finance, infrastructure and people.

Table 5.8: Competitive Indices According to the Size of Firms in South Africa

Sub-Categories	Ranking	Local Economy	Internationalisation	Government	Finance	Infrastructure	Management	Science & Technology	People	Total
Large	1	0.565	1.131	0.178	-0.09	-0.018	0.856	0.93	0.096	3.648
Medium	2	0.59	0.365	0.899	1.044	1.009	0.243	0.128	0.948	5.226
Small	3	-1.155	-0.766	-1.08	-0.95	-0.991	-1.099	-1.058	-1.045	-8.144

When the competitiveness indices are calculated according to IMD's current sub-categories the results so far obtained in this study are confirmed. Table 5.9 gives the competitiveness indices for small, medium and large firms calculated according to the 2002 IMD categories.

On total ranking, infrastructure and economic performance and competitiveness increase with firm size. Medium firms are, however, the strongest performers in the sub-categories of government and business efficiency. It should be noted that IMD does not calculate the infrastructure index in the same way currently compared to the methods before 2001. This is why the values in tables 5.8 and 5.9 differ. The newest index (like table 5.9) also includes science, technology, innovation, quality, environment and health in the sub-category for infrastructure.

Table 5.9: Competitive Indices and Firm Size: IMD 2002 Categories						
Sub-Categories	Ranking	Economic Performance	Government Efficiency	Business Efficiency	Infrastructure	**Total**
Large	1	1.008	0.224	0.237	0.903	2.372
Medium	2	-0.017	0.869	0.860	0.171	1.883
Small	3	-0.991	-1.093	-1.097	-1.075	-4.256

As the indices that were calculated only confirm what were learned above about the competitive platform when the results of the questionnaire were analysed, the calculation of indices could be seen as unnecessary. It does, however, provide additional information of the sub-categories. The calculation of indices as a kind of standardised standard deviations might also be questioned. The total average values of the sub-categories (groups of questions) are compared to the corresponding indices in table 5.10 and it can be seen that the difference in information revealed do not differ much.

Table 5.10: Comparison between Category Total Averages and Indices According to Firm Size										
Sub-Categories	Ranking	Local Economy	Internationali-sation	Government	Finance	Infrastructure	Management	Science & Technology	People	**Total**
Large Total	1	3.421	3.269	2.842	3.357	3.239	3.653	3.388	3.313	26.482
Index		0.565	1.131	0.178	-0.09	-0.018	0.856	0.93	0.096	3.648
Medium Total	2	3.427	2.646	2.982	3.429	3.396	3.482	3.244	3.444	26.05
Index		0.59	0.365	0.899	1.044	1.009	0.243	0.128	0.948	5.226
Small Total	3	3.007	2.478	2.599	3.302	3.089	3.108	3.03	3.138	5.226
Index		-1.155	-0.766	-1.08	-0.95	-0.991	-1.099	-1.058	-1.045	-8.144

These indices do, however, compare different groups of firms, according to size, province or industry with each other. The general idea is that by calculating a sort of standard deviation conceals information. It does not show where the competitive strengths in a particular province or industry are. Plain average totals

might then be of more value to investors in a particular province that wish to know where the best type of firms are to invest in. Investors from outside a province or industry can, however, utilise the indices to see which industries or provinces are the competitive winners to invest in. Or if government wish to subsidise human resources the indices can indicate where it would be most efficient. Total values can reveal more about the internal competitive structure and strength of an industry or province, while indices compare elements of the competitiveness platform and total competitiveness of industries or provinces with each other.

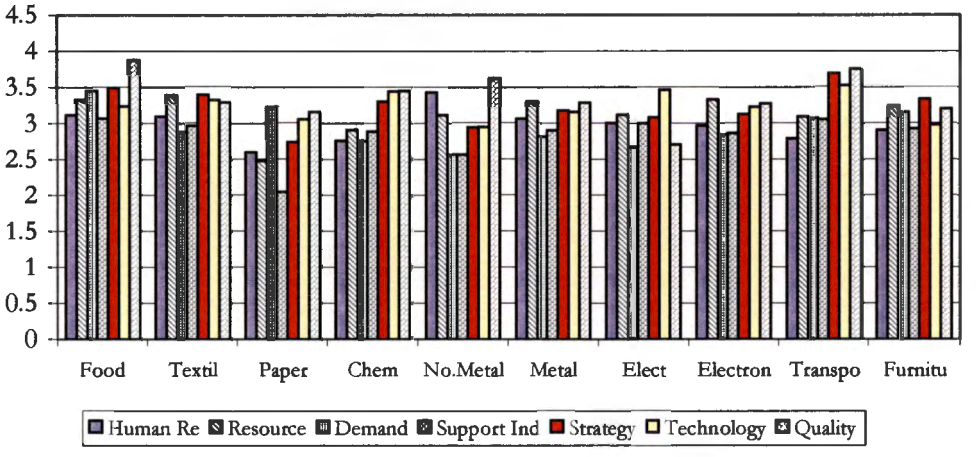
The following section will consider the competitiveness of the various manufacturing sub-sectors in South Africa, starting by making an overall comparison and considering competitiveness indices of the manufacturing sub-sectors in South Africa.

5.5.4 COMPETITIVENESS OF THE MANUFACTURING SUB-SECTORS: EMPIRICAL FINDINGS

5.5.5.1 Overall Comparison and Competitiveness Index

This section describes the competitiveness of the ten sub-sectors of the manufacturing industry according to the Standard Industrial classification (SIC) of Statistics South Africa (SIC 30111 - 39520). It should be noted that the SIC classification in South Africa differs from the International Standard Industrial

Figure 5.11 Industries: Strengths and Opportunities



classification (ISIC) in the composition of groups and classification numbers. ISIC numbers starting with 34 are, for instance, products of paper, printing and publishing, but in South Africa it is non-metal mineral products. The South African sector for paper, printing and publishing products also includes wooden products. ISIC 35 sector includes chemicals, petroleum, rubber and plastic products, which is about equivalent to SIC 33 in South Africa's, while SIC 35 includes basic metal products. On inspection of figure 5.11 the competitiveness of sub-sectors rate *"fair"* on average and do not differ much from each other. On this five-point scale where a 2 is poor and 4 is good, no sub-sector are rated as good or excellently competitive, although some factors are poor.

Table 5.11: Competitiveness of Manufacturing Sub-Sectors

Item	Food Proc	Textile	Paper & Wo	Chem	No Metal	Metal	Elect.	Electronic	Transport	Furniture
Turnover ≥R10m	67%	71	50	59	0	46	100	20	100	33.3
Overhead Rm	18	13.2	1.7	100	0.09	5.6	1	2.53	26.3	3.4
For. Trade >25%	8.3%	0	0	80	100	31	0	0	60	0
Ave no. Workers	11	432	1035	1227	12	140	350	350	813	25
Firm Age	36	35	30	25	14	31	10	18	50	26
Know. SDIs %	16.7	0	50	14.3	33.3	7.7	0	0	40	0
Pd Enh- SDIs %	33.3	0	100	0	0	0	0	0	25	0
IRTS - SDIs %	0	0	50	0	0	0	0	0	20	0
Flex. Prod. %	33.3	33.3	0	16.7	0		0	40	25	33.3
Internet %	100	83	100	67	67	77	100	80	100	67
Human Re (1-5)	3.11	3.09	2.59	2.762	3.424	3.051	3	2.964	2.782	2.9
Techno (1-5)	3.23	3.31	3.05	3.442	2.939	3.157	3.455	3.218	3.506	2.97
Location (1-6)	3.36	3.42	2.62	2.865	2.924	3.4	2.93	3.17	3.67	3.013
Costs (1-3)	1.74	2.09	2.5	2.02	2.1	2.13	2	1.99	2.25	2.26
Shortages (1-3)	1.8	1.6	2	1.68	1.54	1.62	2.15	1.95	1.54	2.16
Expans. (yr)	1-3	4-5	4-5	4-5	4-5	4-5	1-3	4-5	1-3	1-3

On table 5.11 it is shown that there are wide variations in firm size as measured by annual turnover, overheads and number of employees according to manufacturing activity. Average age of firms vary between ten and fifty years. Non-metal mineral products and the chemical industry export more than a quarter of its production, transport about half of that, while very little processed food and metal products are exported. This probably implies that most agricultural products and metals are exported without any value added and products that are produced are locally consumed. This presents opportunities to local entrepreneurs, which could be further exploited.

Most manufacturing industries have very little knowledge of SDI developments in their vicinity and only food processing, paper and wood products and transport equipment indicated that they gained anything from the development of SDIs and IDZs. Only the food processing, electrical appliances, transport equipment and furniture manufactures indicated that they plan on expanding their existing plants within the next three years. All sub-sectors indicated that when they expand it would be at the same location where they currently are.

Competitiveness indices were calculated for firms according to ***manufacturing sub-sectors*** and summarised in table 5.12 and 5.13. These indices and its sub-categories can be compared to reveal more information about the level of relative competitiveness of the various manufacturing sub-sectors in South Africa. It shows that although some sub-categories differ as well as the rankings of the two tables, food processing, textiles and transport are the strongest competitors while non-metal mineral products, chemicals, paper and wood products are the weakest. Furniture has a high competitive index, while wood and wood products are very low. While chemicals and transport both received much support and subsidies from government in the past, transport are now highly competitive, while the chemical industries are not.

Table 5.12: Competitive Indices According to Manufacturing Industry

Sub-Sector	Ranking	Local Economy	Internationali-sation	Government	Finance	Infrastructure	Management	Science & Technology	People	Total
Food Process	1	2.223	0.726	0.711	0.627	0.914	-0.415	0.252	1.487	6.525
Textiles	2	0.466	0.467	0.595	0.834	0.908	0.49	0.129	0.325	4.214
Basic Metal Prod	3	-0.483	0.121	0.151	1.568	0.912	-0.206	0.169	1.487	3.719
Transport	4	0.559	1.175	0.055	0.091	-0.007	0.872	1.016	-0.709	3.052
Furniture	5	0.559	0.445	1.395	0.375	0.986	-0.275	-1.494	-0.028	1.963
Electronics	6	0.116	-0.907	0.329	0.248	0.895	-0.122	0.302	0.466	1.327
Electrical	7	-0.707	0.434	-0.091	0.248	-1.335	1.255	1.016	-0.585	0.235
Non-Metal Mine	8	-0.18	-0.994	-1.064	-0.635	0.108	-0.02	-0.834	0.621	-2.998
Chemicals	9	-0.305	0.879	-0.606	-0.617	-0.882	-2.57	-1.957	-1.246	-7.304
Paper & Wood	10	-0.486	-0.138	-2.232	-2.276	-1.402	-2.57	-1.957	-1.246	-12.307

The paper sub-sector recently bought major paper companies in the United States and might in future become more competitive. In the sub-category of internationalisation transport, chemicals and food processing have the highest indices (again in that order), which could lead to a stronger competitive position in future. In both table 5.12 and 5.13 food processing, transport and furniture are the most competitive in the sub- categories of local economy and economic performance. In government and government efficiency, furniture is also the top performer followed by food processing and textiles, although in different order. Business efficiency indices are highest among the food processing, non-metal mineral products and electrical machinery manufacturers, while electrical machinery, transport and textiles scored the highest indices in the category for management.

Table 5.13: Competitive Indices and Manufacturing Sub-Sector: MID 2002 Categories

Sub-Sector	Ranking	Economic Performance	Government Efficiency	Business Efficiency	Infrastructure	Total
Food Process	1	1.354	0.646	0.965	1.814	4.779
Transport	2	1.063	0.374	-0.625	0.999	1.811
Textiles	3	0.513	0.668	0.165	0.063	1.409
Furniture	4	0.531	1.253	-0.111	-0.291	1.382
Basic Metal Prod	5	-0.091	-0.016	1.34	-0.139	1.094
Electronics	6	-0.617	0.285	0.463	0.093	0.224
Non-Metal Mine	7	-0.79	-1.201	0.885	0.694	-0.412
Chemicals	8	0.527	-0.743	-1.322	0.328	-1.21
Electrical	9	0.053	-0.096	0.543	-1.88	-1.38
Paper & Wood	10	-0.281	-2.112	-1.911	-0.67	-4.974

Indices for finance are most competitive for non-metal mineral products, textiles and food processing. Table 5.12 gives the highest indices to furniture, food processing and textiles, while table 5.13 rates food processing, transport, and non-metallic mineral products highest. Judging from their composition, table 5.12 is probably closest to reality in this instance. People are most competitive in food processing, basic metal products and non-metal mineral products, which are all labour intensive. It was also seen in table 5.17 that non-metal mineral products and basic metal products have the highest productivity index

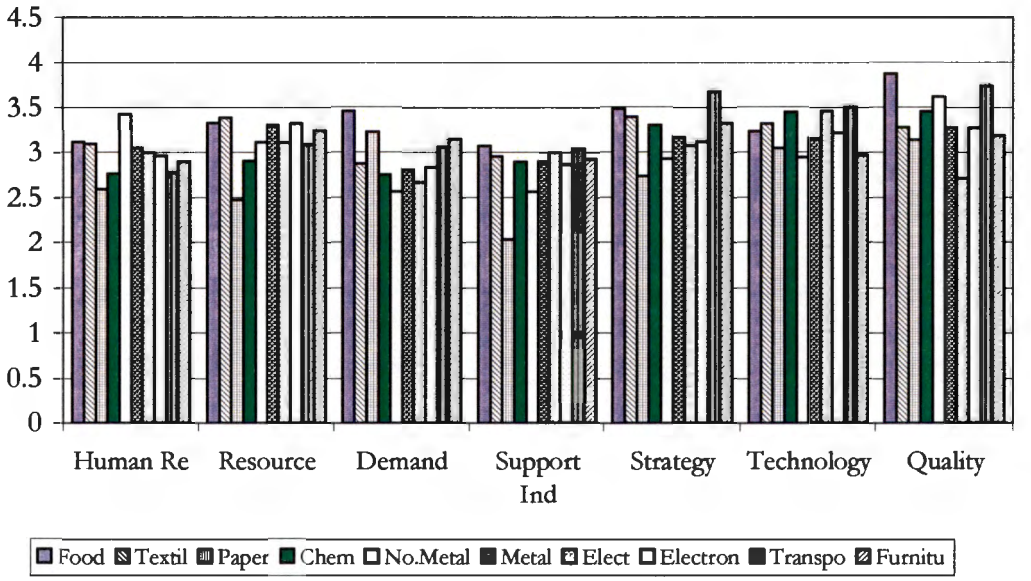
followed by chemical industries. As transport, electrical machinery and appliances, and electronics are science and technology based industries, it is to the advantage of these sub-sectors that they are also the most competitive sectors in the sub-category for science and technology. This might be so, but deeper analysis above revealed that the last mentioned two industries are still not efficiently equipped to compete successfully in the international arena sustainable in the long-term. They are, however, on a good base to start from. On average, most sub-sectors that have high competitive rankings also have high competitive indices for the sub-categories, while the weak performers are below average on most sub-categories.

The next paragraphs will focus on the competitiveness of the individual sub-sectors of manufacturing in South Africa, starting with the *Food, Beverages and Tobacco manufacturing sub-sector.*

5.5.5.2 The Food, Beverages and Tobacco Manufacturing Sub-Sector

Figure 5.12 compares the average responses of the various sections on competitive strengths and investment opportunities of the questionnaire. From figure 5.12 it can be seen that the level of ***human resources*** employed in the *Food, Beverages and Tobacco processing industries* (SIC 30111 - 30600) are considered

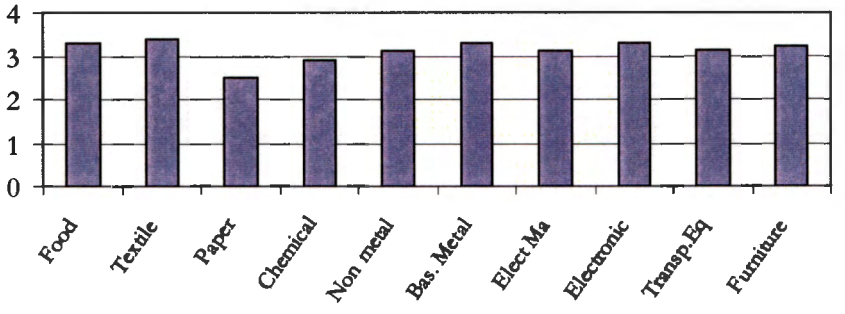
Figure 5.12 Industries: Competitive Strengths and Investment Opportunities



to be *"fair"* but not as *"good"* as that of the other manufacturing industries. This is probably due to the fact that the food processing industries are capital intensive and utilises mainly unskilled labour. Food processing industries rate the availability of managerial staff as a problem and like most industries they rate the inefficiency of civil servants and the low work ethics and low productivity as poor. All other factors are fair rating the availability of unskilled labour as best.

With regard to ***physical resources***, it can be seen from figure 5.13 that these factors are on average rated as fair but not the highest of all industries. Telecommunication services and social infrastructure are rated best, while traffic at border posts and harbours and the sea transport network, followed by the import of inputs and poor project development and financial support are damaging their competitive position.

Figure 5.13 Resources of Manufacturing Industries

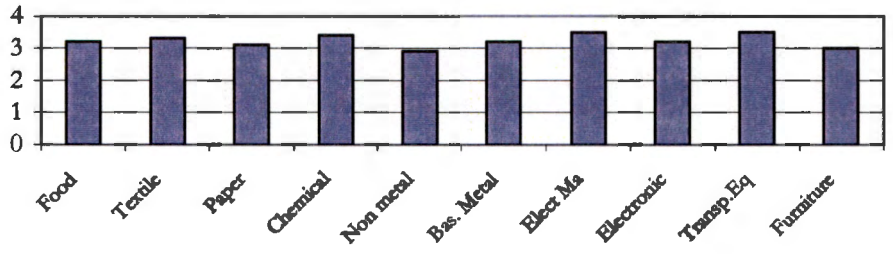


Although local demand for processed food, beverages, and tobacco is good, poor government demand and the effect of HIV/AIDS on demand are decreasing their manufacturing growth. All other factors relating to ***demand conditions*** are rated as fair by the responding firms. Aspects concerning ***related and supporting industries and institutions*** are rated between poor and fair. Support from business associations, sub-contracting by other manufactures and local suppliers are rated best in this category. Their dependence on imports and government incompetence are the poorest factors retarding competitiveness.

All factors related to ***firm strategy, structure and rivalry*** are rated as fair with co-operation with suppliers and clients rated between good and excellent followed by their co-operation with the government and managerial skills in integration and innovation of business activities. Although rated as fair, investment in new production technology and their utilisation of cell phones and other modern communication technology were rated best in the category on ***technology and innovation.*** Although all responding firms

have access to the internet their utilisation of it is only rated as fair. They do, however, have fairly good market and product information, utilise sub-contractors and 41.7 per cent of the responding firms specialise in the production of a particular part or phase of production of the final goods. From the responses the impression is taken that although sufficient companies are not actively involved in the gathering of competitive intelligence and modern flexible production technology is not applied.

Figure 5.14 Technology & Innovation in Manufacturing Industries



New innovations are not further developed and patented and technological and knowledge spill-overs from other firms are poorly utilised. From figure 5.14 it can be seen that the level and utilisation of technology in the food processing industries are not the best of all manufacturing sub-sectors.

As can be seen from figure 5.12 respondents of food processing firms rate the quality of their products, both for local consumption and exports highest of all manufacturing sub-sectors. The quality of their inputs range between fair and good. The cost to comply with environmental protection legislation are, however, very high.

Availability of harbour facilities and ocean freight services are failing and the availability of cold storage facilities, raw and semi-processed materials and intermediate inputs restrict production. Business support services are lacking, investment from abroad is low, while aid and other government incentives are poor. Positive ***aspects related to location*** are the quality of the water supply, courier services are well, links to main roads and trucking services are good. Semi- and unskilled labour is abundant, markets near, and personal contact with customers is good.

Respondents of food processing firms ***expect*** local and export orders and demand to decline in the near future. Political and policy stability and ***business conditions*** are perceived as poor and respondents don not expect the situation to improve within the following twelve months. The highest cost factors are the average purchasing prise per unit of raw material and taxes as percentage of sales. Municipal taxes, levies,

and permit costs are also presenting some obstacle to manufacturing and it is assumed that this trend will persist in the near future. Raw materials relative to planned production is too low but capacity utilisation was anyway expected to improve during the following quarter and delivery time is constantly improving. Shortages of raw materials, machinery, equipment, and packaging and marketing materials are presenting slight problems to producers.

International trade restrictions and barriers, import dumping on local markets, the non co-operative civil service, bribery and corruption are deteriorating factors hampering manufacturing activities. Insufficient demand and the cost of credit, especially interest rates on short-term loans as well as access to and the cost of water and electricity are factors that were expected to limit investment decisions during the following twelve months. In total, the manufacturing sub-sector for food processing, beverages and tobacco do not experience large obstacles to competitiveness although more should be done to add value locally and enter and expand foreign markets.

5.5.5.3 The Textiles, Clothing, Leather and Footwear Manufacturing Sub-Sector

On inspection of figure 5.11 the overall impression is that the competitiveness of the *Textiles, Clothing, Leather and Footwear manufacturing sub-sector* (SIC 31111 - 31700) is a little bit less competitive than the food processing industries, but on average still rated as fair. The strongest factors relating to ***human resources*** are the good supply of available unskilled labour, and fair availability of artisans and managerial staff. This is important for the sub-sector, as textiles are usually labour intensive and most industries experience problems in obtaining sufficient artisans. The weakest factors are a low work ethics among labour and inefficient servants.

As can be seen in figure 5.13 respondents rated ***physical resources*** highest in the textiles sub-sector. The high quality of telecommunication services, availability of suitable land and road and rail network, which are rated between fair and good, enhance competitivity in this sub-sector. The high cost of credit, which is also expected to persist during the following twelve months, and poor research facilities, resources, support services and scientific infrastructure decrease competitiveness.

Low government demand and export opportunities to Africa and the Middle East as well as the effect of population growth and HIV/AIDS have a negative impact on ***demand conditions*** in the textiles and clothing industries. The strongest factors in this category are the size of the local market and fair export opportunities to the rest of the world.

No responding textile, clothing and leather firm rated any factor concerning ***related and supporting industries and institutions*** as excellent. In this category, the strongest factors are their contact with organisations and firms in other countries, local suppliers and sub-contracting to other firms. The lowest factor was the utilisation of support services and other manufacturing firms in the industrial district.

The strongest competitive factors on ***firm strategy, structure and rivalry*** are their co-operation with clients, which are rated as good, followed by co-operation with suppliers, managerial skills and business contacts. Co-operation with the government and competitors are rated as poor. It can be seen from figure 5.14 that ***technology and innovation*** in the textiles, clothing and leather industries are not exceptionally proficient but fair. Their utilisation of cell phones and similar communication technology are good and use of internet fair with 83 per cent of the companies having access to internet. Their product and market information ranges between fair and good. A fair amount of investment in new production technology is made and new innovations are often made and utilised within the firm although such investments are seldom further developed and patented.

Respondents considered the quality of their products as ranging between good and fair although exported products are marginally better. The quality of materials used is rated as sufficient but the cost involved to adhere to standards is high.

Responding firms in the textile industries do not plan to expand their operations during the next three years although their utilisation of production capacity is expected to improve during the following three months. A third of the respondents manufacture only part or a phase of the final product and sub-contractors are utilised in some instances. Although other related manufacturing firms are often absent from the industrial district, technological and knowledge spill-over are fairly utilised. The strongest factors ***relating to location*** are the proximity of main roads and courier services, the quality of water and electricity supplied, availability of professional services and health services. Not much textiles, clothing and leather products are exported compared to the other industries but harbour facilities and freight services are still a problem. The proximity of raw materials and the high cost of water and electricity, high transport costs, the lack of government aid and incentives are factors that hamper competitivity. Other obstacles are import tariffs and other trade restrictions, high rates and taxes and the distance from markets.

Investment from abroad is poor as the risk is too high, political and policy stability poor and ***perceptions and expectations of business conditions*** unsatisfactory. Although not remarkable, the largest average

cost increases per unit of production are for the price of labour and raw materials and these increase are expected to continue. Capacity utilisation is expected to increase and delivery times are improving. The only shortage that hampers production slightly is the availability of skilled labour and it is expected that the availability of raw materials relative to planned production might be too low during the following quarter.

Factors that are expected to limit the textile industries' ability to invest during the next twelve months are insufficient demand, tax structures and the availability and cost of credit. It is expected that investment in new capacity, land and buildings are going to decline during this period. Declining demand and high short-term interest rates, municipal taxes, levies and permit costs are hampering the activities of manufacturers and the situation is deteriorating. Import dumping on the local market, bribery and corruption are on the increase and this together with international trade restrictions and barriers an uncooperative civil service presents slight obstacles to producers. In total, the sub-sector is not experiencing any serious problems and its competitive position is fair.

5.5.5.4 The Paper, Wood Products, Printing and Publishing Sub-Sector

On inspection of figure 5.11 it seems as if the manufacturing sub-sector for *Paper, Wood Products, Printing and Publishing* (SIC 32101 - 32600) is the least competitive of all sub-sectors. As with the data concerning the Northern Cape and Limpopo provinces, the response was below five per cent of the total response for the sub-sector paper, wood products, printing and publishing, as well as electrical machinery. Conclusions about these responding firms can therefore not be generalised for that particular industries, and is only given here for the sake of comprehensiveness and should be interpreted purely as an academic exercise. From table 5.11 it can be seen that the responding firms from the paper, wood products, printing and publishing sub-sector were on average large firms with half of them having an annual turnover in excess of ten million Rand and employing on average 1035 workers per firm. The ages of those firms range between 19 and 40 years, although no firms export more than a quarter of its total production.

Respondents from the paper, wood products, printing and publishing firms rated all ***human resources*** between very poor and fair, presenting it an all over rating for this category as poor. The availability of unskilled labour and technical staff are the only factors rated as fair. Civil servants are very inefficient, while the availability of artisans presents a problem, and wage rates, high unit labour costs, low work ethics and low productivity and an insufficient number of industrial training facilities decrease the competitiveness of these firms.

From figure 5.12 it can be seen that human and physical capital, support services and strategy factors are rated as the poorest of all industries. The cost and reliability of electricity is the only ***physical resource*** factor rated as good, while the telecommunication services, the road and rail network, and the availability of suitable land were all rated as sufficient. Support from trade and business associations is very poor as well as traffic at border posts and harbours and the air transport network.

Although government demand is very low and the effect of HIV/AIDS has a negative impact on ***demand conditions***, this category are generally rated as satisfactory as the structure of the local demand and consumer sophistication and market differentiation are rated as good. Local suppliers were the only factor of ***related and supporting industries and institutions*** rated as good while co-operation in the value chain and the charring of critical activities are rated as sufficient. The utilisation of support services, sub-contracting by other firms, incompetence of government and the low quality of legal institutions are all rated as very poor.

Although responding firms of the paper, wood products, printing and publishing sub-sector rate their ability to enter foreign markets as fair, their growth in exports are poor. Co-operation with their clients are this sub-sector's strongest factor relating to ***firm strategy, structure and rivalry*** followed by fair co-operation with suppliers, good employee performance incentives and managerial skills. Their worst managerial and strategic factors are poor business contacts and poor co-operation with government.

Except for poor upgrading of the production process and input mix, all factors related to ***technology and innovation*** are rated as fair. The use of computers in the production process and new innovative applications of existing technology got the highest ratings ranging between fair and good. All responding firms have access to the internet and utilises it fairly well but their competitive intelligence is low and their information on markets and products is poor. None of these firms specialises in the production of only a phase of the final product but manufacture the whole product.

They rate the ***quality*** of their products between fair and good and utilises fairly good quality material inputs. The cost of complying with standards is very high. The same applies for the cost of complying with the ***environmental*** protection legislation, which is also unclear and lacking.

No paper, wood products, printing and publishing firm plans to expand their activities within the next three years. Investment in land and buildings is expected to decline within the next twelve months and foreign investment is very poor. The investment risk is high and political and policy stability are seen as

failing. Among the factors ***related to location*** the availability of courier services, industrial land, the cost and reliability of electricity and transport cost in are rated between good and excellent. The availability of skilled labour, the lack of government aid and incentives, proximity to markets, entertainment and recreational facilities are all aspects rated as failing. As indicated in table 5.11 only half of the responding firms are aware of SDIs or IDZs in their vicinity and of those all thought that these developments enhanced their manufacturing activities while half of the firms indicated that the SDIs and IDZs led to increasing returns and economies of scale and scope.

Firms from the paper, wood products, printing and publishing are the only sub-sectors that perceive ***business conditions*** to be satisfactory. Their respondents believe that local demand; orders and production are going to expand during the following quarter. Their costs are not rising as fast as for the other industries but it is expected that the average total cost per unit of production is going to deteriorate mainly due to the escalating cost of raw materials. With higher demand capacity utilisation is expected to increase. Slight shortages are experienced by this sub-sector in the availability of all kinds of labour, maintenance and support services. Other shortages hampering manufacturing activities also slightly are with raw materials, water, machinery and equipment, packaging and marketing material and technology and knowledge support services.

High short-term interest rates and the availability of medium term finance are a serious problem. The lack and cost of credit, together with the tax structure, shortages of raw materials and a lack of managerial skills and investment support are also the factors that will limit firms ability to invest during the following twelve months.

5.5.5.5 The Chemicals, Plastic, Rubber and Petroleum Products Sub-Sector

It can be seen from table 5.11 that more that 80 per cent of the manufacturing sub-sector for Chemicals, Plastic, Rubber and Petroleum Products (SIC 33100 - 33800) export more than a quarter of their products and a fifth of the firms export more than three quarters of their total production. Firms in this sub-sector have a fairly good ability to enter foreign markets and expand their export growth. High import tariffs and other international trade restrictions are therefore a serious obstacle to them as it restricts their international competitiveness. This also applies to traffic at boarder posts and harbours and facilities at harbours and airports.

It can be seen on figure 5.11 that their strongest competitive strengths lie with firm strategy, technology, innovation and high product quality. The other categories are, however, rated as poor. The average number of employees in the responding firms is 1227.1 workers. The best factors related to ***human resources*** are the availability of unskilled labour followed by managerial staff, which is still rated as poor. Like in most cases, the poorest factors are the inefficient civil service and the unavailability of artisans and technically skilled personnel.

Figure 5.12 shows that factors related to ***physical resources*** are also on average rated as poor by responding firms of the sub-sector of chemicals, plastic, rubber and petroleum products. Support from trade and business support associations is poor, as is access to finance, research facilities, resources, support services and scientific infrastructure. Access to finance might be a problem due to the large amounts involved in this industry. Half of the responding firms have an annual turnover in excess of R10 million and overheads of up to R300 million per annum averaging at R100.2 million. Their strongest resource factors are the services of telecommunication services and the application of modern technology.

It can be seen in figure 5.12 that ***demand conditions*** in the manufacturing sub-sector of chemicals, plastic, rubber and petroleum products are poor. The strongest demand factor is the size of the local market and export opportunities to the developed world. Factors working negatively in on demand are low export opportunities to Africa and the Middle East, the levels of market differentiation and saturation and the structure of local demand and consumer sophistication.

The factors restricting competitiveness the most in the category of ***related and supporting industries and institutions*** are firstly very poor government interventions, incompetence, and policies followed by poor utilisation of supporting industries and support from business associations. The best factors are linkages in technology, access to information, exchange of research and joint solving of problems and co-operation in the value chain. Although their utilisation of the internet are poor and only 67 per cent of the responding firms have access to internet, their market and product information is fair, suggesting that their competitive intelligence is sufficient.

Managerial skills in the integration and innovation of business activities are rated as good, followed by sufficient business contacts, managerial practices and co-operation with clients. Their worst factors related to ***firm strategy, structure and rivalry*** are co-operation with the government, co-operation with competitors and low growth in profits.

Although the processing of chemicals is a science-based activity their utilisation of computers in the production process is poor. They do, however, invest fair amounts in new production ***technology*** and upgrade their input mix and production processes constantly. New innovative applications of modern technology and research within the firm creating innovations and new technology are continuously done up to a satisfactory level. New innovations within the firm are also fairly often further developed and patented, something that is seldom done in the other industries.

The ***quality*** of final products for local consumption is rated between fair and good and those for export are good. The quality of input materials is fair to good. ***Environment*** protection legislation and guidelines are, however, poor, unclear and lacking.

Technological and knowledge spill-overs from other firms are fairly utilised but related manufacturing firms within the industrial district are usually absent. This and the poor utilisation of support services and lack of governmental aid and incentives are surprising as much had been done already to enhance chemical and petroleum clusters in South Africa. Although infrastructure development like the upgrading of the N4 toll road probably assisted manufacturing activities, most firms thought the added costs from toll fees are too high. Only 14.3 per cent of the respondent firms were aware of existing SDIs in their vicinity and no firm though that it enhanced their manufacturing activities or led to any increasing returns or economies of scale or scope. A third of the companies indicated that they specialise in the manufacturing of only a part or phase of the final product and found the availability of raw materials and intermediate products to be a problem. The strongest ***aspects relating to location*** of the manufacturing sub-sector of chemicals, plastic, rubber and petroleum products are the quality and reliability of water, electricity and other utilities followed by the availability of semi- and unskilled labour, sub-contactors, school and colleges. Several of the larger companies in this sub-sector do, however, also supply and/or subsidise the last mentioned social capital as well as entertainment and recreational facilities. The quality and availability of other social infrastructure provided by the government like health services are, however, rated as poor or very poor. Next to obstacles presented by air, sea and transport, the availability of container services, professional, corporate finance, after-sales service, industrial land and proximity to spare parts restrict manufacturing activities at their present locations. None of the responding firms plan expansion of their current activities and if they would in four years time it would mostly be at the same location. This is probably because most chemical firms are situated near the supply of raw materials.

The manufacturing sub-sector of chemicals, plastic, rubber and petroleum products find current ***business conditions*** unsatisfactory and deteriorating and political and policy stability poor. It is found that local

orders and sales are declining and the situation is expected to persist in the near future. The average cost of raw materials and the cost of labour per unit of production are increasing rapidly and this trend is expected to continue during the next quarter accelerating the increase in average total cost per unit of production. No shortages are experienced but the availability of all kinds of labour, excluding managerial staff, and water, electricity and other utilities, packaging and market material and technology and knowledge support services are deteriorating.

Insufficient demand is restricting activities slightly and will limit the ability of firms to invest during the following twelve months. Investment will also be limited during this period by the tax structure and the lack of managerial skills and investment support. Investment in new capacity, machinery, equipment, land and buildings are expected to decline during that time. Although not hampering manufacturing activities, lead-time for expatriate work permits, import dumping ion the local market, availability of medium-tem finance, co-operation of the civil service, bribery and corruption are deteriorating and could present obstacles to competitiveness later. In all competitiveness of the manufacturing sub-sector of chemicals, plastic, rubber and petroleum products seems reasonable with strong elements relating to management, strategy, technology and quality. There are, however, opportunities for further development.

5.5.5.6 The Non-Metal Mineral Products, Ceramics and Glass Sub-Sector

Studying figure 5.11 reveals reasonable competitive strength in the manufacturing sub-sector of Non-Metal Mineral, Ceramics and Glass Products (SIC 34111 - 34299), but remarkably weak aspects relating to demand and supporting services. The responding firms were all small with average employment of 11.7 people and none with an annual turnover exceeding six million Rand. All the responding firms are, however, well established and none are younger than ten years.

On the factors concerning ***human resources*** only the availability of unskilled workers were rated as good and the efficiency of civil servants as poor by responding manufacturing firms in the sub-sector of non-metal mineral, ceramics and glass products. All other factors are fair. The availability of technical and managerial staff is the strongest factor and high wage rates and unit labour costs the most restrictive.

No ***physical resource*** factor is rated good or excellent. The best factors are telecommunication services, support given by trade and business associations and information relating to product and market. Aspects retarding competitiveness most in this category are the cost of capital, import of inputs and the sea

transport network, as most of their inputs and produce are very heavy and should be shipped. Respondents also rate ocean freight services and airport facilities as poor.

The size of the local market is the best ***demand condition*** factor rated as fair followed by export opportunities to Africa and the Middle East and the structure and sophistication of local demand. The worst demand factor is government demand followed by the effects of population growth and HIV/AIDS on demand.

Government policies, competence and interventions range between poor and very poor. The strongest factors in the category for ***related and supporting industries and institutions*** are their co-operation with competitors, sub-contacting with other firms, and linkages to technology, information, exchange of research and the joint solving of problems, all rated as fair. Although these factors are rated as fair, the utilisation of computers in the production process, research within the firm, and the utilisation of technological and knowledge spill-overs are poor. Their use of the internet is also poor and only 67 per cent of the responding firms have excess to internet. Their strongest factor related to ***technology and innovations*** are their use of cell phones, innovative application of new and existing technology and new innovations within the firm, which are also further developed to their advantage.

In the category of ***firm strategy, structure and rivalry*** respondents of the sub-sector non-metal mineral, ceramics and glass products co-operation with competitors and clients and managerial practices are rated best though fair. Factors depressing competitiveness are a poor ability to enter foreign markets and low growth in exports and profits. The ***quality*** of their final products are rated as good both for the local and international market. No respondent rate their quality on local markets less than good. The quality of their inputs is rated as fair and the cost to comply with standards exceptionally high.

Although all responding firms manufacture the entire final product sub-contractors are often utilised. The best ***aspects relating to location*** are the quality of telecommunication services, water and electricity, the availability of health services, which is very important to this industry, personal contact with clients, good courier services and good main road links. The availability of ocean freight, container and trucking services need attention though. The proximity of railheads and the availability and cost of industrial land are failing.

Respondents of the sub-sector of non-metal mineral, ceramics and glass products perceive ***business conditions*** to be poor and expect the situation to deteriorate in the near future. No responding firm plan to expand operations within the next three years. Political and policy stability are rated very poor, the

investment risk is large and foreign investment failing. Responding firms also expect their investment in capacity, especially in land and buildings, to decline during the following twelve months, mainly due to the tax structure and seriously high cost of capital.

The availability of technology, knowledge, maintenance and support services are declining and slight shortages in raw materials, maintenance and support services are hampering activities of this sub-sector. Slight problems are experienced with the high levels of short-term interest rates and municipal taxes, levies and permit costs and the situation is deteriorating. Except for the high cost of capital, the sub-sector of non-metal mineral; ceramics and glass products do not experience serious problems, which obstruct their ability to compete.

5.5.5.7 The Basic Metal Products and Machinery Manufacturing Sub-Sector

Of the manufacturers that responded to the survey, the largest number totalling 22.4 per cent were from the sub-sector for Basic Metal Products and Machinery (SIC 35101 - 35900). Responding firms were on average large with 46.2 per cent of the firms having an annual turnover exceeding R10 million and 139.8 employees. The firms are well established with an age ranging between one and 105 years averaging at 30.8 years. Inspecting figure 5.11 indicates that no aspect relating to competitive strengths is very high, but none is poor either.

As with most manufacturers, responding firms of basic metal products and machinery also rated the availability of unskilled labour as good and highest in the category for ***human resources***, while the inefficient civil servants are rated poorest. This sector experience a shortage of managerial staff and an absence of vocational and industry related training facilities. The usual problems with workplace regulations, high wage rates, and high unit labour per output cost, low productivity and a low work ethics are also hampering competitiveness in this industry.

The cost and reliability are the best factors relating to ***physical resources,*** rated as good by manufacturers of basic metal products and machinery. Other factors with high ratings are the level of development of the financial and banking sector, the availability of capital, and access to finance, although not good. Physical factors retarding competitiveness are poor scientific infrastructure, dependence on imported inputs, traffic at boarder and harbours and poor social infrastructure.

Demand conditions are poor with the strongest factor being fair export opportunities to the developed world. The weakest factors are low government demand and the effect of HIV/AIDS on market demand.

Local suppliers and linkages to technology, information, research and the solving of problems are the strongest factors ***related and supporting industries and institutions*** although still only rated as fair. Co-operation with competitors is poor and government competence, policies and interventions are regarded as inadequate as all manufacturers in South Africa aspire the government to increase its support, aid, subsidies and incentives to enhance manufacturing.

As indicated in figure 5.12, ***firm strategy, structure and rivalry*** of manufacturers in the basic metal products sub-sector are about average. Co-operation with clients range between fair and good, while managerial practices and co-operation with suppliers are also strong factors rated as fair. Co-operation with competitors and the government and employee performance incentive are regarded as poor. Concerning ***technology and innovation,*** utilisation of cell phones got the highest rating followed by investment in production technology and innovations within the firm. The utilisation of computers in the production process, internet and technological and knowledge spill-overs from other firms were rated as the poorest factors. It seems as if competitive intelligence in the basic metal industry is poorly developed. Internet is not utilised sufficiently, spill-overs not utilised, sub-contracting is poor and co-operation with other manufacturers in the industrial district are poor. Respondents do, however, rate their market and product information as sufficient and 46.2 per cent of the firms specialise in the producing of only a part or phase of the final product. The basic metal products and machinery sub-sector regards the ***quality*** of their final products as exceptionally fair and those intended for the local market marginally better.

The availability of harbour facilities and high import tariffs and other international trade restrictions are failing the basic metal products and machinery manufacturing sub-sector. The availability of ocean freight, high transport costs and lack of government aid and incentives are ***factors related to location,*** which hamper manufacturing activities and are rated as very poor. As transport is an important locational consideration, high transport costs are depressing competitiveness in this sub-sector. Fortunately for these firms, the accessibility of main road links, courier, container and trucking services are good. Other factors rated as good are the quality and reliability of water and other utilities, the availability of corporate financial services, and an abundance of semi- and unskilled labour.

Although responding firms in the basic metal products sub-sector perceive political and policy stability as very poor and ***business conditions*** unsatisfactory, expectations are that it would improve slightly during

the next few months. The probable investment risk is rated as poor investment from abroad nearly non-existent. Short-term interest rates, low demand and municipal taxes, levies and permit costs hamper manufacturing activities to some extent and the problems are deteriorating. The high cost of credit and tax structures also inhibit investments during the next twelve months, especially investment in land and buildings. Other factors that are deteriorating but not hindering activities yet are availability of medium-term finance, import dumping on local markets, bribery and corruption. The availability of raw materials are the only shortage that are sometimes experienced by manufacturers, while the availability of all types of labour, excluding managerial staff, and the supply of water, electricity and other utilities are deteriorating. In total the sub-sector manufacturing basic metal products and machinery do not experience serious factors hampering their international competitiveness. They are well established but do not show outstanding potential to increase their competitiveness and profits in future months.

5.5.5.8 The Electrical Machinery and Equipment Manufacturing Sub-Sector

As can be expected of a science- and technology-based industry, like the sub-sector manufacturing Electrical Machinery and Equipment (SIC 36100 - 36600), their proficiency in technology and innovation are of the highest of industries in South Africa. As can be seen from figure 5.11 competitive strengths of this industry are about average, but demand conditions and quality are low.

The strongest factor related to ***human resources*** is the excellent availability of unskilled labour but at a very high unit labour cost. All other factors in this category are rated as fair. As for ***physical resources*** the availability of suitable land is excellent and respondents rate the development level of financial intermediaries, availability of capital and market and product information as good. The cost and reliability of electrical supply, social infrastructure and traffic at boarder posts and harbours are poor. The size of the local market and export opportunities are rated as fair, all other factors concerning ***demand conditions*** are rated as poor. Local suppliers are rated as good but dependence on imports is a problem and government competence, policies and interventions are poor.

Managerial skills, practices and business contacts are rated as good. The same apply to their co-operation with clients and their ability to enter foreign markets, but manufacturers in the electrical sub-sector finds it very difficult to realise growth in exports and profits. The ***quality*** of final products is, however, perceived to be high both for the local and international market and they employ high quality materials as inputs.

Respondents of the sub-sector manufacturing electrical machinery and equipment rated factors of ***technology and innovation*** between fair and good. Large investments in new technology are annually made, cell phones and other modern communication technology as well as computers in the production process are utilised intensively. They continuously find new innovative applications of existing technology and much research are done within the firms to create new innovations and technology. A fair amount of technological and knowledge spill-overs are also utilised from other firms. As indicated in table 5.11 all the responding firms also have access to the internet.

Most manufacturers in the electrical machinery and equipment sub-sector perceive political and policy stability not as a problem and ***business conditions*** as satisfactory and do not expect the situation to change during the following quarter. The investment risk is low and most firms plan on expanding their activities to during the next three years and also consider branching out to other locations. They experience slight problems to obtain medium-term finance and the cost of short-term finance is a serious problem hampering activities. The lack and high cost of credit, tax structures, shortages in water and electricity as well as a lack of managerial skills and investment support are regarded as factors that will hamper investment during the following twelve months slightly, while insufficient demand and shortages of raw materials are a serious problem. Respondents are, however, planning to increase investment in machinery and equipment during this period, as it is a very competitive and technology intensive industry to operate in.

Sales and orders are expected to decline further during the next quarter, while the prices of raw materials and labour are expected to increase continually. Serious shortages are also experienced in the availability of skilled labour and managerial staff, while slight shortages in machinery, equipment, maintenance, support services as well as in technology and knowledge support services are sometime experienced.

No responding firm was aware of any SDIs in their vicinity and could not see any advantage that such developments could hold for them. The strongest ***aspects related to the location*** of their premises are excellent personal contact with their customers, abundant industrial land, and enough skilled and unskilled labour. Ocean freight and courier services are rated as good and markets are close. Proximity to main road links and professional services are very poor and problems are also experienced with the distance from spare parts, raw and semi-processed material and the availability of health services, schools and industrial training facilities. In all, the sub-sector is doing well in the utilisation of its human resources and development of its technological base, but experiences high competition and finds it difficult to expand local markets.

5.5.5.9 The Electronics, Radio, Television and Instruments Sub-Sector

It can be seen from figure 5.11 that the manufacturing sub-sector of Electronics, Radio, Television and Instrumentation products (SIC 37100 - 37600) has some competitive strength in resources and quality but its level of technology is not as high as that of electrical machinery and equipment. In fact, respondents rated the level of technology of three other sub-sectors higher. As electronics is a science- and technology intensive industry, this is a point of major concern that should be given much more attention. In total 10.3 per cent of the firms responding to this survey came from the electrical and electronic industries. On average, responding firms from the electronic sub-sector were large with an average number of employees of 350.4 workers and 20 per cent of the companies having an annual turnover exceeding R10 million. No responding company exports more than a quarter of their production output indicating another point of concern.

As can be seen from figure 5.12 ***human resources*** are on average satisfactory. The strongest factors in this category are the availability of unskilled labour and technical staff. The inefficiency of civil servants are the worst aspect followed by lack of vocational and industry related training facilities, low work ethics, high labour costs, and restrictive labour legislation. Figure 5.13 shows that ***physical resources*** of the electronic industries are of the best of all sub-sectors although still only rated as fair. Respondents rated the cost and reliability of the electrical supply as the best followed by their application of modern technology and the level of development of financial intermediaries. An alarming factor is the low level of scientific infrastructure available, while availability of capital and the sea transport network are also rated as poor.

The structure and sophistication of local demand is the best ***demand*** factor though still only rated as fair. Export opportunities are rated as poor as are local demand conditions. The effect of population growth and HIV/AIDS on competitiveness and low government demand is also depressing demand conditions. The best factors relating to ***related and supporting industries and institutions*** are support from business associations, sub-contracting and linkages to technology, information, research and joint problem solving, although still rated as fair. The worst factor deteriorating competitiveness is the poor co-operation with competitors and poor quality of legal institutions as well as incompetence of government, poor government policies, and poor co-operation in the value chain and sharing of critical activities.

Respondents of electronic industries rate co-operation with clients as the strongest factor relating to ***firm strategy, structure and rivalry***. Other strong factors rated as fair are managerial practices, business

contacts and managerial skills in integration and innovation of business activities as well as their co-operation with suppliers. The ability of electronics to enter foreign markets and growth in exports is poor.

Electronics industries in South Africa employ only fair quality materials and respondents rate their final products only as fair. It is alarming that a scientific- and technologically intensive industry like electronics only utilises a "fair" amount of computers in their production process and, as can be seen on table 5.11, only 80 per cent have access to internet and even those that do have internet only utilise it fairly. In such a technology intensive industry the utilisation of the most modern technology is an absolute necessity. Market and product information in the field of electronics are therefore also only rated as fair and it seems as if competitive intelligence in the electronics, radio, television and instrumentation sub-sector are very poor and need special attention. Research within firms creating new technology and innovations are seldom conducted. New innovations within the firm are rated between fair and good but these innovations are seldom further developed and patented. Manufacturers do, however, invest a fair amount in the acquisition of new production technology. There was, however, 60 per cent of the responding firms that rated new innovations within their firms, the use of computers in the production process, and upgrading of their input and production mix as good or excellent.

About 60 per cent of the responding electronic firms indicated that they specialise in the production of only a part or phase of the final product. With such a low level of competitive intelligence, the unavailability of other related manufacturing firms in the industrial district and only fair utilisation of technological and knowledge spill-overs from other firms, it does not seem as if modern flexible production technology is already generally employed in the electronics industry. These manufactures do not plan any expansion within the next three years and when they eventually do, it is expected that it would be at the same location. There were, however, 40 per cent of the responding firms that did report good utilisation of spill-overs.

As in most industries, the cost and reliability of telecommunication services, water and electricity are the strongest factor ***related to location*** for the electronic industries, together with good main road links and courier services. Personal contact with customers, the availability of corporate financial services and after sales services is also rated as good. The biggest problems deteriorating competitiveness are a shortage of container and trucking services, intermediate inputs and aid and incentives from government, which are all regarded as failing. Other locational factors rated as poor by respondents are high transport costs, distance of railheads and markets, import tariffs, and other international trade restrictions and a shortage of raw materials.

Like in most firms that participated in this survey, respondents perceive investment risk to be large, the political and policy stability as poor and ***business conditions*** as poor and do not expect the situation to change in the following quarter. It is expected that investment in machinery, equipment, land and buildings will decline during the next twelve months. Insufficient market demand, the unavailability and cost of credit, the tax structure and a lack in managerial skills and investment support are expected to limit their ability to invest slightly during this period.

Export orders and sales are expected to decline during the next three months and the total cost of per unit of production is expected to increase during the next quarter mainly due to rising costs of raw materials. Rising local sales prices are also expected to increase, pushing market demand further down. The availability of managerial staff, machinery, equipment, technology and knowledge support services are deteriorating and presenting slight obstacles to production. Other shortages that present some obstacles are the availability of skilled and semi-skilled labour, electricity and other utilities. On average, the competitiveness of the electronics, radio, television and instrument sub-sector of manufacturing compares fairly with that of the other industries in South Africa as can be seen in figure 5.11 although it is still only rated on average as fair. If the electronics industries of South Africa are to withstand the competition from abroad, much will have to be done regarding the upgrading and development of their level of and competence in technology and innovation.

5.5.5.10 The Manufacturing Sub-Sector for Transport Equipment

As could be expected, the size of the responding firms manufacturing transport equipment (SIC 38100 - 38790) was all large companies. All are well established firms of an average age of 50.3 years, employing on average 812.5 employees, having overhead costs of R26.3 million on average per annum and all have turnover exceeding R10 million per year. Sixty per cent of these firms export more than a quarter of their produce to other countries. Inspection of figure 5.11 reveals a competitive level, with among the highest sectors as its proficiency in business management; technology and innovation are the highest of all industries and the quality of its produce ranges between good and excellent.

As can be seen in figure 5.12 respondents rated ***human resources*** in the transport equipment manufacturing sub-sector as poor. Only the availability of unskilled labour is rated as fair. The efficiency of civil servants is low and the availability of artisans, technically skilled personnel and managerial staff is

poor. High wage rates and an unproductive workforce have a detrimental effect on the industry's competitivity.

Although no ***physical resource*** is rated as good, the level of development of the financial and banking sector is fair and so are the availability of capital and social infrastructure. The poorest factors in this category are the high cost of capital, traffic at border posts and harbour and poor road, rail and air transport network.

The strongest factors in the category of ***related and supporting industries and institutions*** for manufacturers or transport equipment are their co-operation with competitors, and linkages to technology, information, research and joint solving of problems rated as fair. Contact of the responding firms with organisations and firms in other countries are poor. It should, however, be noted that none of the nine major motor vehicle manufacturers were included in the sample, although they were represented in the original population from which the random sample was drawn. Other weak sports are their poor co-operation in the value chain, critical activities are not shared, sub-contractors seldom used and support services poorly utilised.

Although the size of the local ***demand*** market is poor, export opportunities and government demand are fair. Respondents rate the co-operation of the manufacturers of transport equipment with their clients, suppliers and their business contacts as good. Managerial practices and their ability to enter foreign markets and gain export growth also receive a high rating though fair.

The expertise of the transport equipment sub-sector in the field of ***technology and innovation*** is important, as transport equipment is a technology-based industry. No factor in this category received a poor rating from respondents. In this category, the best factors are the utilisation of computer technology in the production process and continued upgrading of production processes and their input mix, which were rated as excellent. Investment in new technology is satisfactory and new innovations within the firm are often further developed and patented. Research within the firm creating innovations and new technology are also undertaken.

Although sub-contractors are not often utilised, their availability to transport equipment manufacturers are good and technological and knowledge spill-overs are utilised fairly. A quarter of the manufacturers specialise in the manufacturing of only part or a phase of the final product but it does not seem as if modern flexible production is already part of the reigning paradigm in the industry. It seems as if

competitive intelligence in the sub-sector for transport equipment is well developed. The use of the internet, cell phones and other similar communication technology are rated between fair and good and their information about the market and products are fair. As was shown all the responding firms in this sub-sector have access to internet and e-mail.

Some pollution do occur during the production process and the cost involved to comply with product quality standards while adhering to ***environmental*** protection legislation has a fair impact on the competitiveness of these manufactures. Manufacturers in the transport equipment sub-sector are well located. The strongest factors regarding their location are quality and reliability of water, electricity, telecommunication and other utilities, proximity to main road links and railheads, good availability of trucking, container, courier, corporate finance services and support services. The close proximity of markets, and social infrastructure in their vicinity are also regarded as good, including schools, colleges, health services, quality shopping centres, entertainment and recreational facilities. Water and transport costs are, however, expensive and airport and harbour facilities, ocean fright services, import tariffs and other trade restrictions, the supply of spare parts and after-sales service, the availability of raw material and intermediate inputs, industrial training facilities, skilled labour and proximity to professional services are all rated as poor. Similar to the other industries, manufactures of transport equipment rated the lack of government assistance, aid and incentives as failing them. Forty per cent of the responding firms were, however, aware of SDI and IDZ developments in their vicinity and of those a quarter thought that it enhanced their manufacturing activities and 20 per cent experienced increasing returns and/or economies of scale due to that.

Respondents from transport equipment manufacturing rated political and policy stability as very poor but see the probable investment risk as fair and ***business conditions*** as satisfactory and marginally improving. High taxes and rates and the high cost of credit are the only factors that present some restriction to their ability to invest during the following twelve months. During this time respondents expect to increase their investment in machinery and equipment marginally, although investment in new capacity will decline slightly. Short-term interest rates are also deteriorating and hampering activities slightly, and investment from abroad are very poor.

Export orders and sale volumes are rising and responding firms expected this to continue during the following quarter. The price of raw materials are the cost factor increasing most and would continue to do so in the near future, but it is not expected to present any problems. Although not a problem yet, the availability of raw materials and managerial staff are deteriorating. Factors that already present slight

obstacles to production activities are shortages in skilled labour, machinery and equipment and maintenance and support services, and the situation is deteriorating. The only other factor that is hampering activities is the non co-operation of the civil service. Other factors that are slightly deteriorating, not causing any problems yet are low local demand, import dumping on local markets, bribery and corruption, high municipal taxes, levies and permit costs and a shortage of medium term finance. On average the sub-sector manufacturing transport equipment seems to be competitive and expanding. It is proficient in its application of modern technology and enjoys gains from innovation. Considering all factors, the transport equipment industry seems to be one of the best equipped industries to answer to future challenges presented by the new economy. The next section concludes this study of manufacturing sectors by considering the competitiveness of furniture manufacturing.

5.9.5.11 The Manufacturing Sub-Sector for Furniture

The furniture-manufacturing sub-sector (SIC 39101 - 39520) is not as competitive as the previous industry when figure 5.11 is inspected. It is not as strong as the transport or chemical industries when firm strategy, technology and quality are considered but it also has no factor that are rated poor either, giving it a fair level of competitiveness in all categories. In the long term, this might be what is required for sustained industrial development.

As can be assumed from a country with an abundant supply of unemployed and unskilled labour like South Africa, the ***human resource*** factor that has the strongest impact on the competitiveness of the responding firms in the furniture industry is the availability of unskilled labour. Artisans, technical and managerial staff are less available. The strongest negative aspect is workplace regulations, followed by poor vocational and industry related training facilities. Suitable land, electricity, telecommunication services and capital are well presented ***physical resources***. Poor support from business associations and traffic at border posts and harbours presents problems, while research facilities, resources, support services, scientific infrastructure and information are poor.

No factor concerning ***related and supporting industries and institutions*** are rated as good or excellent by any firms except some firms that have excellent contact with organisations and firms in other countries. The strongest factors in this category, although only rated as fair, are the utilisation of support services, and linkages to technology, joint solving of problems and co-operation in the value chain. Dependence on imports is, however, a problem.

The size of the local market is rated between fair and good while export opportunities also received a fair rating. No responding furniture manufacturer exports more than a quarter of their products though. The level of market saturation, low government demand and the effect of HIV/AIDS are considered to be the factors depressing ***demand conditions*** most. Good business contacts is the factor in the category of ***firm strategy, structure and rivalry*** rated best by respondents, followed by profit growth, co-operation with clients and suppliers and employee performance incentives which are rated between fair and good. Export growth is the only aspect rated as poor. The ***quality*** of materials used in the production of furniture, and the quality of products exported are rated as fair, while those products meant for the local market ranges between fair and good.

The sub-sector manufacturing furniture is mostly labour-intensive and only a reasonable level of ***technology and innovation*** is required. It is therefore not surprising that this category received a poor rating by respondents. The strongest factors in this category are new innovative application of new and existing technology and new innovations made within the firm rated as fair. These innovations are sometimes further developed and patented. Although computers are used fairly in the production process, the input and production mix are seldom upgraded and research if any within the firm is very limited.

A third of the responding firms are involved in the production of only a part or phase of the final product, although sub-contracting is rarely done and the utilisation of technological and knowledge spill-overs are poor. There are a good number of other manufacturers within the industrial district but co-operation with competitors is also poor. Cell phones are used fairly, but not the internet. As shown in table 5.11 only 66.7 per cent of the responding firms have access to the internet. Their access to market and product information are poor and no responding firm had any knowledge of SDI development near them. It seems that the level of competitive intelligence of furniture manufacturers is poor.

All the furniture manufacturers that participated in this survey plan on expanding their operations either this year or during the next two years. This is partly due to the fact that this industry experiences fair demand conditions and expects export orders and sales to expand during the following quarter. On the other hand, insufficient demand for their products do hamper activities slightly and restrict the ability of the respondents to invest within the following twelve months (to some extent this sounds contradictory). Firms do, however, regard their current location as satisfactory.

The strongest ***aspects relating to location*** are good main road links and trucking services, reliability of telecommunication services, electricity, water and other utilities, the availability of skilled and unskilled

labour and the proximity of raw materials. Aid from government is lacking, import tariffs and other trade restrictions present problems, and investment from abroad is very poor. Proximity to suppliers of spare parts is failing them, while intermediate inputs are unavailable, labour and transport costs are too high and industrial training facilities are not available. The availability of airport and harbour facilities, ocean freight and container services, and distance from railheads are all rated as poor. The same applies to the availability of social capital like health services, quality shopping centres, entertainment and recreation facilities.

Responding furniture manufacturers rate political stability as poor and ***business conditions*** unsatisfactory. Costs are deteriorating much, especially the cost of raw materials and sale prices on the market, both locally and abroad, and the trend is expected to continue during the following quarter. The availability of raw materials relative to planned production is a serious problem hampering manufacturing activities and this problem is expected to persist in the near future. Finished goods relative to expected total demand are, however, expected to be sufficient and delivery times to improve during the following three months. The availability of semi-skilled labour, especially artisans, is deteriorating, while shortages in the supply of water, electricity, other utilities and packaging and marketing material hampers the activities of furniture manufacturers to some extent.

Short-term interest rates, the availability of medium-term finance, and the cost of capital in general cause a slight problem, as well as escalating taxes as percentage of sales, which are expected to persist, and the tax structure hamper activities slightly and limit the ability of furniture manufacturers to invest during the following twelve months. On the whole, investment in new capacity is expected to increase during this period in the furniture industry though. Municipal taxes, levies and permit costs and lead time for expatriate work permits are deteriorating and causing slight obstacles to production. Import dumping on local markets, bribery and corruption are also escalating but not hampering production yet. On average, the competitiveness of the furniture manufacturing sub-sector is not very high but optimistic and not experiencing many problems that impede expected future growth.

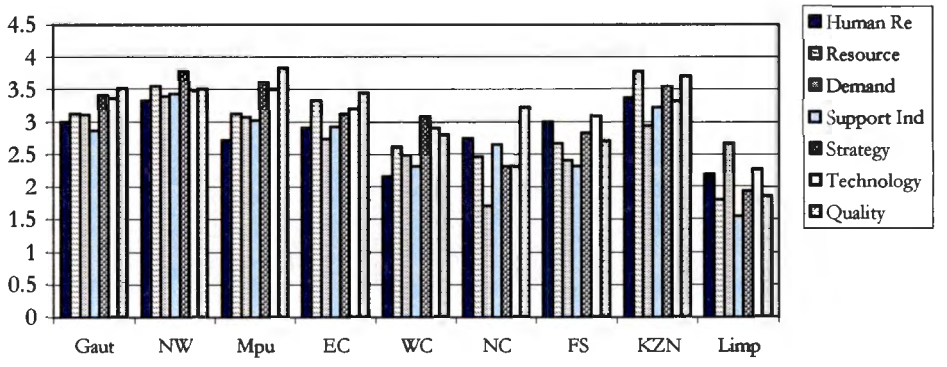
The following section considers the competitiveness of the manufacturing industries in the various provinces of South Africa.

5.5.6 THE COMPETITIVE PLATFORM OF PROVINCES: EMPIRICAL RESULTS

5.5.6.1 Overall Comparison and Competitiveness Indices of Provinces

In this section, the competitiveness of the firms that participated in this survey are studied according to the provinces in which they are situated. The competitive strengths of the various provinces are shown in figure 5.15 according to the averages of the main categories of the questionnaire considering competitive strengths and investment opportunities on a five-point scale where 3 indicated fair, 4 good and 2 poor.

Figure 5.15 Provinces: Competitive Strengths and Investment Opportunities



From figure 5.15 it can be seen that none of the provinces had a significant absolute advantage above others. Although Gauteng has the most firms and contributes most to South Africa's GDP, it is not the most competitive. Competitiveness of KwaZulu and North West seems to be the highest on average while Limpopo, the Western and Northern Cape Provinces are the least competitive. This will, however, only be verified when competitiveness indices are determined and tested for statistical significance later in this chapter.

Table 5.14 compares some of the important aspects relating to the competitive platform of provinces, similar to table 5.6. From the table it can be seen that the average size of the respondents did not vary much between most provinces, but firms size according to the number of employees varied between 22 in the Western Cape to 2673 in Mpumalanga. Overhead costs also varied between about one million Rand in Limpopo, the Western and Northern Cape, to more than R152 million in Mpumalanga.

Although all the respondents in Limpopo and North West Provinces were aware of SDIs in their vicinity, while only half of the respondents in the province with the best developed SDI, the MDC in Mpumalanga,

were aware of its existence. Of those that were aware of the SDIs near them only those in Limpopo, Mpumalaga and Gauteng thought that it was of any benefit to them. In Mpumalaga only a quarter of the respondents indicated that the SDIs enhanced manufacturing in their firms to some extent and in Gauteng 12.5 per cent. Those in Limpopo indicated that the introduction of SDIs led to large increasing returns and/or economies of scale to their companies, but in Gauteng only 12.5 per cent of the firms indicated this.

Table 5.14: Competitiveness of Provinces

Item	Gaut	NW	Mpu	EC	WC	NC	FS	KZN	Limp
Turnover ≥R10m	38.5%	66.7	66.7	55.7	0	50	42.9	75	0
Overhead Rm	2.9	6.5	152.5	12.9	1.13	1	4.5	37.7	1.67
For. Trade >25%	12.5%	0	50%	11.1	100	50	57.2	0	0
Ave no. Workers	553	106	2673	236	22	311	35	568	70
Firm Age	30.5	19	29.3	34.9	71.3	55	21.4	27	19
Know. SDIs %	8	100	50	11.1	0	0	14.3	0	100
Pd Enh- SDIs %	12.5%	0	25	0	0	0	0	0	100
IRTS - SDIs %	12.5%	0	0	0	0	0	0	0	100
Flex. Prod. %	36.8%	42.9	40	33.3	0	50	28.6	50	0
Internet %	88.5%	87.5	83	89	100	50	50	100	100
Human Re (1-5)	3	3.33	2.72	2.91	2.15	2.74	3	3.37	2.18
Techno (1-5)	3.37	3.49	3.5	3.21	2.91	2.32	3.09	3.32	2.27
Location (1-6)	3.23	3.22	2.895	3.574	2.73	2.5	3.18	3.81	1.49
Costs (1-3)	2.25	2.02	1.99	2.2	2.15	2.3	2.44	2.48	1.21
Shortages (1-3)	1.73	1.95	2.16	1.51	1.49	1.68	1.51	1.37	2
Expans. (yr)	1-3	1-3	1-3	4-5	1-3	?	4-5	4-5	no

Modern production technology is probably highest developed in Gauteng, North West and KwaZulu and worst in Limpopo and the Northern Cape. This will be studied in more detail in the rest of this chapter. Most manufacturers utilise the internet and have an e-mail address. Flexible production is taking place in most firms. In KwaZulu and the Northern Cape half of the respondents indicated that they specialise in the production of only certain stages of the final product and use is also made from sporting services and sub-contractors. In Mpumalanga and North West, more than 40 per cent follow this procedure and in Gauteng 26.8 per cent. The following paragraphs consider the competitiveness of the various provinces in more detail.

A ***competitiveness index*** was calculated for the various ***provinces*** similar to the World Competitiveness Index of the International Institute for Management Development (IMD) discussed in section 5.2.1. Similar to the competitiveness indices of firm-sizes and sub-sectors, it was decided to calculate the index

first according to the categories that was used by the IMD until 2000 as that provided more information about the various provinces. Indices according to the recent categories of the IMD were calculated thereafter. In order to do this, different groups of questions were selected from the survey to form the sub-criteria like local economy; internationalisation and technology, and then it were tested to determine whether the groups form a reliable instrument, if it measured what it is supposed to, and whether it is statistically significant. The methodology followed was explained in chapter 1 of this thesis. Literature of the IMD on their calculation of the World Competitive Indices is not very clear and it was decided to base the calculations on their methodology (IMD, 2001:516-7) but alter it to suit the need of this study. Basically the method calculates a group average and compares, firms or groups of firms in provinces or industries using their standardised standard deviation from the average. A higher value implies higher competitiveness, while a positive value implies competitiveness above the average and a negative value indicates a level of competitiveness that is below average. It was further decided not to convert the data first to a ten-point scale. It would only complicate the calculations and as it is only an index comparison, would still be possible. If these calculated indices have to be compared with those of the IMD, the values can all be multiplied by two, but as this survey uses different sets of questions such comparisons would be misleading.

Table 5.15

Sub-Categories	Cronbach-Alpha Coefficients
Local Economy	0.899
Internationalisation	0.806
Government	0.846
Finance	0.78
Infrastructure	0.824
Management	0.773
Science & Technology	0.899
People	0.717

The next step was to calculate the values the Cronbach-Alpha coefficients for the various groups of questions for the entire population (as was done with the firm-size and sub-sector indices in sections 5.5.4.1 and 5.5.5.1). These values are given in table 5.15 and the high Cronbach-Alpha values indicate that they served as a reliable instrument to measure the proposed indices and can be taken as statistically significant.

The Competitiveness Indices calculated for the various provinces of South Africa are given in table 5.16 and ranked with the most competitive at the top of the table. The calculation of indices did not differ from the information given above and in that since it was not an economic exercise. It does have value in that it confirms the conclusions that were made above and the sub-categories of the indices provide additional information on the industrial competitiveness platform. This is also the reason why the competitiveness indices were calculated both according to the sub-categories that the IMD used until the year 2000 (see table 5.16) and their current sub-categories (see table 5.18). Basically, the competitiveness indices show the standard deviation of those firms from the average of the sample that was studied. A positive value indicates a value stronger than the average and a negative index is weaker than the average. From table 5.16 it can be seen that the most competitive provinces are KwaZulu Natal, North West and Mpumalanga (always given in the order according to index ranking). Competitiveness of Limpopo and Northern Cape were of the weakest as was expected although the weak performance of Gauteng and Western Cape were a surprise as these provinces have large manufacturing sectors. Their low levels of competitiveness were, however, revealed in the preceding sections above.

Table 5.16: Competitive Indices of the Provinces of South Africa

Sub-Categories	Ranking	Local Economy	International-isation	Government	Finance	Infrastructure	Management	Science & Technology	People	**Total**
KwaZulu/Natal	1	0.872	0.623	0.893	0.744	1.584	0.921	0.987	1.592	1.032
North West	2	1.301	1.134	1.184	0.64	0.713	1.029	0.759	0.217	0.965
Mpumalanga	3	0.971	1.368	0.484	0.591	0.22	0.674	0.918	-0.567	0.687
Eastern Cape	4	0.306	0.55	0.252	0.653	0.923	0.206	0.041	0.408	0.473
Gauteng	5	0.478	0.085	0.574	0.145	0.347	0.336	0.531	0.867	0.401
Northern Cape	6	-1.031	-0.925	-0.922	-0.572	-1.125	-0.965	-1.434	-0.526	-0.999
Free State	7	-0.673	-0.483	-0.177	0.471	-0.498	-0.017	-0.123	0.572	-0.113
Western Cape	8	-0.727	-0.796	-0.229	-0.308	-0.85	-0.054	-0.319	-0.898	-0.465
Limpopo	9	-1.496	-1.557	-2.059	-2.365	-1.314	-2.133	-1.728	-1.664	-1.971

The high ranking of KwaZulu Natal, North West and Mpumalanga also correlate with their high rankings on Science and Technology and this also correlated with the totals on the original survey on which was reported above. Technology, strategy, quality and resources were found to be strong factors in these three

provinces according to the totals of the survey and this is confirmed with this indices. They are also the most competitive according to the sub-category index of human capital. This is an important factorespecially in industries that are labour-intensive. These provinces also have of the highest productivity indices, although table 5.17 reveals that the productivity index of the Free State is slightly stronger than that of Mpumalanga. Even though the group of questions used to calculate this index have a significant Cronbach Alpha Coefficient, the questionnaire was not, however, designed to determine a productivity index. On internationalisation, Mpumalanga and North West is the strongest. On government, North West and KwaZulu are most competitive followed by Gauteng and Mpumalanga. It might have been expected that Gauteng and Western Cape would be the strongest on government related issues because it is the constituencies of the parliament and central government, but this is not the case. The sub-categories follow the total indices rather closely. If a province is competitive in one category it usually is also competitive in the rest. The top three provinces are also best with regard to finance and management. On the sub-category of Human Resources, Mpumalaga rates however very low and the top provinces are KwaZulu, Gauteng, Free State and the Eastern Cape. This was, however, already shown when the sections of the questionnaire were analysed above.

Table 5.17: Productivity Index

Provincial Indices		Sub-Sector Indices		Firm Size Indices	
KwaZulu Natal	0.802	Food	-0.199	Large	0.687
North West	0.966	Textiles	-0.563	Medium	0.119
Mpumalanga	0.604	Paper & Wood	-1.378	Small	-1.054
Eastern Cape	-0.208	Chemicals	0.771		
Gauteng	0.383	Non-Metal Mine	1.561		
Northern Cape	-0.434	Basic Metal Prod	0.995		
Free State	0.731	Electrical	-1.897		
Western Cape	-0.681	Electronics	0.178		
Limpopo	-2.164	Transport	0.1778		
		Furniture	0.1778		
Cronbach Alpha Coefficient: 0.741					

Competitiveness indices for provinces were also calculated according to IMD's current categories and listed in table 5.18. These indices correlate closely with the indices of table 5.16 and the positions of the

top ranking provinces did not change. The sub-categories that the IMD currently uses are more or less composites of the categories used previously or compiled by grouping the questions differently. This led to different results, as the survey was not primarily intended to compute indices according to the IMD's method. In the new combinations of questions the only problem was the Cronbach Alpha coefficient for Health that was only 0.284 but the category for people, which included Health was 0.717 and that of infrastructure even higher. Only four questions related to health but as the results were high when used within other groups it was not considered a defect.

Table 5.18: Competitive Indices of Provinces: IMD 2002 Categories

Sub-Categories	Ranking	Economic Performance	Government Efficiency	Business Efficiency	Infrastructure	Total
KwaZulu/Natal	1	0.747	0.896	1.367	1.067	4.077
North West	2	1.223	1.15	0.713	0.453	3.539
Mpumalanga	3	1.17	0.48	-0.07	0.815	2.395
Gauteng	4	0.273	0.552	0.573	0.661	2.059
Eastern Cape	5	0.438	0.282	0.306	0.533	1.559
Free State	6	-0.578	-0.179	0.591	-0.685	-0.851
Western Cape	7	-0.769	-0.111	-0.887	-0.612	-2.379
Northern Cape	8	-0.983	-1.064	-0.705	-0.128	-2.88
Limpopo	9	-1.541	-2.015	-1.888	-2.104	-7.548

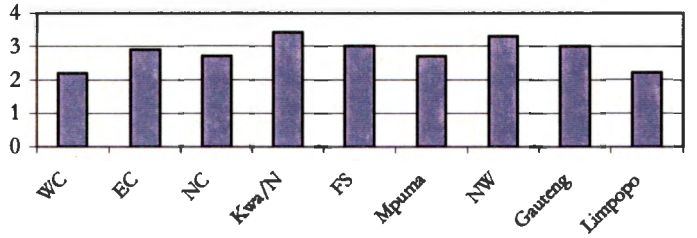
The top three provinces of KwaZulu, North West and Mpumalanga also have the highest indices for Economic Performance. In the sub-category of Government Efficiency, Mpumalanga was again replaced by Gauteng, and with Business Efficiency the Free State and Gauteng followed the top two. Mpumalanga was not even among the top five. To calculate the competitiveness indices of table 5.18 an index for institutions was also derived, with a Cronbach Alpha value of 0.831, indicating practical significance. On the institutions index the best performers are North West, KwaZulu and Gauteng. As could be expected, Limpopo, Northern Cape and the Free State have the weakest institutional indices. On infrastructure KwaZulu, Mpumalanga and Gauteng are the strongest. The weak competitive position of the Western Cape as well as Northern Cape and the Limpopo is striking, and none of their sub-category indices were above the average of the other provinces.

The questionnaire was not designed to calculate a Globalisation index and no questions on international political engagement were asked and only one on personal contact, for example. On economic integration various questions could be utilised and the results correlate closely with the sub-category of internationalisation in table 5.16. In the sub-category of technology, KwaZulu, Mpumalanga and North West and are the strongest economies. From the insufficient information obtained from the questionnaire it can be assumed that the provinces that would have the strongest globalisation indices would be these three provinces and Gauteng's globalisation index would be only moderate, although above average.

5.5.6.2 Competitive Platform of Gauteng

Human resources in Guateng manufacturing are on average rated to be fair as can be seen in figure 5.16 but it is not as high as it is supposed to be to support the largest manufacturing province in the country. As can be seen, several other province have better levels of human capital. No aspect regarding human capital was on average rated as good or excellent. The only aspects that are fair are the availability of unskilled and technically skilled labour. Next to the inefficiency of civil servants the poorest aspects are the availability of artisans, low labour productivity and output per worker, high wages rates and workplace regulations contribute towards lower competitiveness.

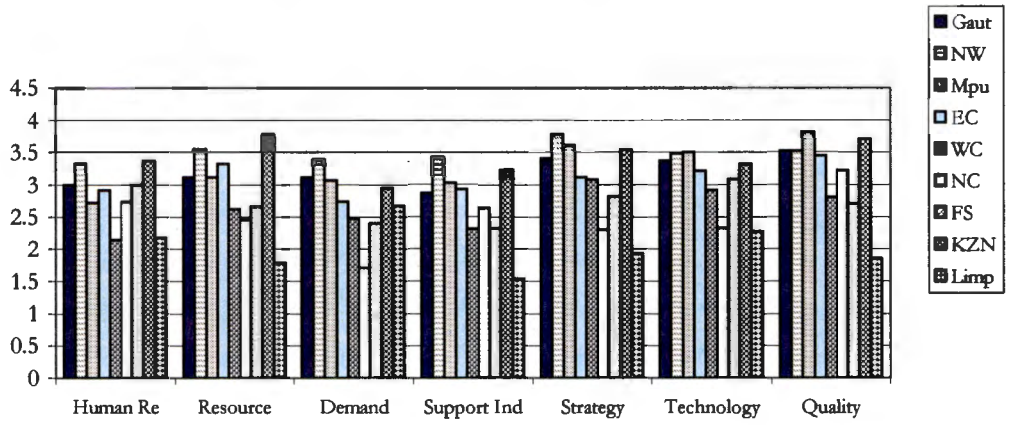
Figure 5.16 Human Capital of Provinces



The main aspects studied in this chapter are summarised in figure 5.17, which is similar to figure 5.15 but compare the various sections of the questionnaire regarding competitive strengths of the various provinces. From figure 5.15 it can be seen that ***physical resources*** in Gauteng are rated a little higher than its human resources, but still not as high as most of the other provinces. Most factors were rated as fair where the province's strongest points are the level, cost and reliability of the communication services and electrical supply, the level of development of the financial and banking sector and their market and

product information. Sea transport and traffic at harbour and boarder posts are rated very low, while the imports of inputs, poor road and rail networks and poor project development and financial support retard the growth in competitiveness of Gauteng firms.

Figure 5.17 Provinces: Strengths and Opportunities



Demand conditions in Gauteng are on average rated as fair. Their strongest points are a fairly sized local market, which is well structured with fairly sophisticated consumers. Aspects of disadvantage are high market or sales prices, the population growth rate and HIV/AIDS and limited export opportunities to Africa and the Middle East.

Related and supporting industries and institutions in Gauteng are on average rated as poor. This is in the first instance due to a non-supporting and inefficient government sector with low competence, and poor policies and interventions. Dependence on expensive imports and inefficient legal institutions are of the worst problems in Gauteng regarding support services and institutions. Business associations and local suppliers are, however, presenting fair support.

Factors related to ***firm strategy, structure and rivalry*** are on average all rated between fair and good and none as bad in Gauteng. Managerial skills in integration and innovation of business activities receive the highest rating by respondents in this category followed by co-operation with clients and suppliers. The worst factors are low growth in profits and exports and weak co-operation with competitors, which is probably due to laws prohibiting such behaviour.

Technology and innovation are also rated as fair in Gauteng and the only factor that is seen as poor is in relation to new patents. New innovations within the firms, however, received the highest rating in this

category, which probably indicates that firms neglect further development and registration of new innovations. The use of cell phones and other communication technology and the upgrading of their production and input mix also received the highest ratings. The weakest points concerning technology are the low utilisation of the internet and poor utilisation of technological and knowledge spill-overs from other firms. These factors are, however, still rated as fair. No factors related to the utilisation of technology are, however, on average rated as good or excellent by Gauteng firms.

The ***quality*** of final products produced in Gauteng both for the local and export markets were rated as fairly good. Unclear ***environmental*** protection legislation and a lack of proper guidelines are regarded as the factor with the largest negative impact on competitiveness in this section.

In Gauteng 36.8 per cent of the manufacturers specialise in the production of only some part or phase of the final production. Co-operation within the industrial districts of Gauteng is, however, low and technological and knowledge spill-overs are rarely utilised sufficiently. Delivery times are declining but there was still not sufficient evidence found to confirm that production runs are becoming shorter and the technology of producers are such that it can easily change their processes to suit specific demand of individual buyers with small orders. The most important ***aspects relating to location*** are proximity to main road links, reliable water supply and available courier services and semi and unskilled labour. Gauteng is a landlocked province and proximity to harbours and harbour facilities will obviously be a restriction to competitiveness. Investments in Gauteng coming from abroad are poor, as are import tariffs and other trade restrictions. Gauteng also suffers from a shortage of cold storages facilities and the availability of intermediate inputs also presents some problems. The usual complaints regarding the absence of incentives and aid from government was also large obstacles to competitiveness in Gauteng

Individual manufacturers also suggested several other types of industries, which they presume would do well in their industrial areas and provinces due to forward and backward ***linkages*** that possibly exist. Some of these include the manufacturing of tin products and packaging material manufactured for other manufacturers like wheat milling, and mining chemicals and equipment, plastic bags and plastic household goods, printers, rubber products and paint. Gauteng has the potential to develop various technological advances and some respondents indicated the need and opportunities for research and development institutions. Plastic and metal smelters in Gauteng and North West could link with various industries, as do the electrical and electronics industries. Cable harnessing and assembly, and the manufacturing of container shell production and mechanical parts could link to electronic and other firms. There are also further opportunities for the manufacturing and assembly of electronic equipment in Gauteng. Battery

manufacturers in Gauteng and the Eastern Cape have a need for local packaging and chemical manufacturing, especially acid.

Foundries that can manufacture high technology castings of high quality and the manufacturing of spring steel with high chromium content were suggested for Gauteng, North West, the Eastern Cape and Free State. It is suggested that this can link with robotic technology assembling products on production lines and that this also offers several backward linkages to other manufacturers. Forge and foundry can also link to the motor vehicle assembly, while increased availability of vehicle and other equipment components are needed in Gauteng. Possible linkages are the manufacturing of clutches made from asbestos-free materials, and the manufacturing of heavy industrial products and factory machinery like CNC machines, these capital goods are becoming too expensive to import.

Other possible manufacturing activities indicated by respondents that could be established in the vicinity of their existing plants in terms of further processing suggested by respondents included enhancement of mining products, integrating mining and the chemical industry to a larger extend, providing more storing facilities especially for mining, agriculture and beverages.

Other potential investments and linkages that exist in Gauteng are bricks and backfill plants, wood and wood products and agro-industries like increasing milling capacity and packaging speed. It was suggested by some respondents that animal and animal by-products could be utilised locally, for instance in the production of pet food. These are currently imported at high cost while it is locally available from the large farming community and the meat industry. These suggestions were made by individual manufacturers in the survey and cannot be generalised. These suggestions should be well researched before implementation. There might be good reasons why these products are not yet produced. Gauteng does not have a comparative advantage in the textiles and clothing compared to the Western Cape and plastic products might do better near the Sasol and coal clusters in Mpumalanga.

Regarding the ***perceptions and expectations of business conditions and costs*** of manufacturers in Gauteng, most had a negative perception of current business conditions and did not think it was going to improve in the near future. The situation is also aggravated by poor political and policy instability. It is expected that unfilled orders relative to total assists will increase and the number of factory workers is going to decline, probably due to shorter working hours and other new labour legislation. The largest increase in cost factors were the average total cost per unit and the average purchasing price per unit of raw material. These are also expected to increase marginally in the near future.

A slight shortage of raw materials is the only shortages experienced in Gauteng. The availability of managerial staff, skilled and unskilled labour is deteriorating. The same applies to packaging and marketing material and maintenance and supporting services. Short-term interest rates are hampering manufacturing activities and respondents expect the situation to deteriorate in future. Other obstacles are the availability of medium-term finance and high municipal levies, taxes and permit costs. Respondents in Gauteng also believe that the non co-operative civil service, bribery and corruption are deteriorating.

5.5.6.3 Competitive Platform of North West Province

It can be seen in figure 5.15 that the competitiveness of manufacturing industries in the North West Province seems to be slightly higher than many of the other provinces. On average, all aspects relating to competitiveness are rated higher than those of Gauteng. This will be verified later in the chapter where competitiveness indices are calculated and compared.

Respondents rated all factors relating to ***human resources*** are as fair except the inefficient civil service and the availability of artisans that is poor. High wage rates, an unproductive workforce, and restrictive workplace regulations all have a fair impact on the competitiveness of firms; while the strongest factor relating to human capital is the availability of managerial staff.

Except for a poor air transport network in North West ***physical resources*** ranging between fair and good contributes to competitivety. The availability and quality of the telecommunication services, market and product information, the availability of capital, research facilities, resources and support services and the support from trade and business associations are all strong factors enhancing the competitiveness of manufactures. Although still considered to be fair, the costs of electricity and credit are limiting factors. Being a landlocked province, North West also experiences some costs to reach harbours and problems with traffic at border posts and harbours.

The most positive ***demand conditions*** in North West are the structure and size of the local market. Consumers are sophisticated and demands quality, while markets are characterised with high levels of differentiation and saturation. Negative factors that weaken competitiveness are first HIV/AIDS, followed by market or sales prices and limited export opportunities, although these factors are still rated as fair.

All factors regarding ***related and supporting industries and institutions*** in North West are rated between fair and good. The most important component of supporting services are the availability and quality of other sub-contracting manufacturers, co-operations in the value chain and sharing critical activities. From these also follows good co-operation in respect to technological linkages, information access, joint solving of problems and the exchange of research. Low co-operation with competitors, poor government policies, interventions and competence are the factors diminishing competitiveness most.

Managerial strategy, competence and practices are rated very high in North West. Other ***firm strategy, structure and rivalry*** factors enhancing competitiveness most are their co-operation with their clients, suppliers and the government. Companies' relation with and perspective of the government are notably better in North West than in the other provinces. Low growth in exports is the only factor rated as poor in this category.

The competitive advantage presented by ***technology and innovation*** is the highest in North West Province. Their use of cell phone and other communication technology are good, 87.5 per cent of the companies utilise the internet and have an e-mail address. They have good information concerning products and the market, all indicating a more sophisticated level of competitive intelligence. Most companies from North West use computers in their production processes, invest large amounts in new production technology and upgrade their input and production mix, continually ensuring a high level of competence and competitiveness. Although still fair, research within the firms creating innovations and new technology are limited and new patents are seldom developed and patented. Research and the advantages of technological and knowledge spill-overs are not utilised to the full and was never rated as excellent by any of the respondents in North West.

Respondents rate the ***quality*** of their products as very good with a very low standard deviation (only 0.5 on a five-point scale) both for local and exported produce. They use material inputs of good quality and their levels of pollution are fair. Guidelines and laws protecting the natural ***environment*** are unclear and often lacking. It is remarkable that firms in the less competitive provinces also do not plan to expand their activities within the next three years. In more competitive provinces like North West, most firms are planning to expand their activities within the following three years, as can be seen in table 5.14.

The strongest factors ***relating to location*** in North West are like in most provinces, the high reliability and availability of water, electricity and communication services. Availability of cold storage facilities is also a problem in this province; while close harbours facilities is always a problem to landlocked provinces.

Other obstacles are a lack of international airport facilities, import tariffs and other international trade restrictions, insufficient aid from government and inadequate housing for employees and key personnel. Other factors enhancing competitiveness to some extent are the availability of business support services, skilled labour, container services and investment from abroad. None of these factors were, however, rated as good by respondents. All the respondents were aware of SDIs in their vicinity but none indicated that it had enhanced their businesses in any way nor did it led to increasing returns or economies of scale.

Some respondents suggested potential and ***linkages*** for foundries that can manufacture high technology castings of spring steel with high chromium content, forge and foundry industries and the availability of vehicle and other equipment components. New ranges of wooden furniture and possible linkages with steel sectors, and also homeware and textiles, were suggested. Plastic and metal smelters manufacturing especially plastic household goods could also ink with existing industries in the North West Province.

The ***perceptions and expectations of business conditions and costs*** of respondents in the North West Province are on average unsatisfactory and political and policy stability is seen as being poor. It is expected that investment in land and building will decline during the next twelve months, while investment support, market demand and the availability of managerial skill are going to deteriorate slightly during that period. Unfilled orders relative to total assets have declined during the resent past and it is expected that this trend will continue and delivery time is going to decline even further. Export orders and sales are, however, expected to decline during the next quarter.

The averages increase in the unit costs of raw materials was the cost factor that experienced the highest increases during the past quarter and this trend is expected to continue in North West. Other costs that are expected to raise most are the average labour cost and average total costs per unit of production. Manufacturers in North West experience no serious shortages although there are slight problems with the availability of managerial staff, machinery, equipment, and technology, knowledge, maintenance and support services. The availability of raw materials and semi-skilled labour are also deteriorating. The level of short-term interest rates and insufficient demand is a slight problem and it is deteriorating slightly, together with municipal levies, taxes and permit costs.

5.5.6.4 Competitive Platform of Mpumalanga

It can be seen from figure 5.15 that competitiveness of firms in Mpumalanga compares well with that of Gauteng and North West. It can be seen that the quality of human capital is lower though but support services are remarkably better. Although it will be further verified it seems as if the level of technology and the quality of production are higher in Mpumalanga than in any other province. Mpumalanga Firms that participated in the survey were on average mostly large firms with a turnover in excess of a million Rand, overheads of R152.2 million and on average more than 2500 workers.

The only factor concerning ***human resources*** that was rated as fair was the availability of unskilled labour. The poorest factors were the inefficiency of civil servants and the availability of technically skilled labour and managerial staff. Wage rates, unit labour costs and low productivity also have a negative impact on competitiveness.

The best factors related to ***physical resources*** in Mpumalanga are the application of modern technology, the availability of capital and the costs and reliability of electricity. With no universities in the province, scientific infrastructure, research facilities, resources and support services are considered to be poor factors retarding competitiveness of firms. Air transport is a problem, social infrastructure poor and support from trade and business associations insufficient.

The size of the local market and export opportunities are good, while demand from government is regarded as very poor. ***Demand conditions*** in Mpumalanga are on average perceived as fair although not as good as in Gauteng and North West.

Local suppliers are the strongest factor consider among ***related and supporting industries and institutions,*** while government competence and interventions are rated as poor. With regard to ***firm strategy, structure and rivalry*** co-operation with the government is also the only factor rated as poor. The best factors enhancing competitiveness are managerial skills in integration and innovation of business activities, managerial practices and co-operation with clients and suppliers.

On ***technology and innovation*** Mpumalanga firms are good at producing new innovations within the firms but also neglect the further development and registration of such new patents. Computers are intensively utilised in the production process and production technology are constantly upgraded. The **quality** of production for the export market is rated as good and high quality inputs are employed but the

cost of compliance to standards is considered to be high. Pollution emissions are fair but legislation concerning **environmental** protection is unclear and lacking. This should be addressed as Mpumalanga with its scenic beauty should be protected and has large tourism potential.

Although the Maputo Development Corridor (MDC) is the best developed SDI in Africa, only half of the respondents have any knowledge of it. Of those only a quarter indicated that the MDC enhanced their production in any way and none gained any increasing returns or economies of scale or scope from it. The proximity to main road links is, however, a very positive aspect relating to ***aspects relating to location*** in Mpumalanga and the upgrading of the N4 toll road probably contributed to this. The quality and reliability of water and other utilities and the availability of courier services are also strong factors enhancing competitiveness in Mpumalanga. The availability of other manufacturing industries and supporting services within industrial districts are rated as fair and at least 40 per cent of the manufactures are specialising in the production of some part or phase of the final product.

Negative factors related to location having a major impact on competitiveness are the distance from semi-processed materials and low levels of investments from abroad. The availability of industrial training facilities, few government incentives, and inefficient health services are presenting problems. As Mpumalanga is also landlocked, the availability of harbour facilities are an obstacle and this is made worse by the lack of container services and international airport facilities. Import tariffs and other international trade restrictions are regarded to be so restrictive to firms in Mpumalanga that respondents rated this factor as failing.

Sugar producers in Mpumalanga and Natal suggest that opportunity exist for sweets factories as well as paper pulpers for the manufacturing of packaging material. Respondents identified various forward and backward ***linkages*** relating to packaging, transport, spares and support industries in Mpumalanga. Potential exist for wood and agriculture, and there exists a close linkage between the furniture sub-sector and plantations. Some respondents indicated further expansion of the furniture industry and others more opportunities for plantations that can supply wood especially for furniture but also for building. It is felt that steel prices are too high because there are an inadequate number of suppliers. More competition between suppliers of steel could be to the advantage of the existing firms in the province. Mechanical manufacturing and maintenance can also still expand in Mpumalanga.

Perceptions and expectations of business conditions and costs of respondents in Mpumalanga are unsatisfactory and this includes their low perceptions of political and policy stability in the country. Export

sales are slightly declining as well as the average hours worked per factory worker and this trend is expected to continue in the near future. Production volumes are expected to rise with higher local orders. Export sale prices are increasing slower than cost factors, while the average labour cost per unit and purchasing price per unit of raw material are rising the fastest and it is expected to continue. The availability of raw materials is deteriorating and shortages are already experienced. Shortage of machinery, equipment, maintenance and supporting service also presents obstacles to manufacturers in Mpumalanga. Insufficient demand and high short-term interest rates presents some obstacle to production and it is expected that the situation is going to deteriorate slightly during the following twelve months.

5.5.6.5 Competitive Platform of the Eastern Cape Province

Manufacturers from the Eastern Cape that participated in this survey were mostly large companies with an annual turnover and overheads above ten million Rand and employment averaging 236 people. In general, competitiveness in the province seems to be above average looking at figure 5.15, although most firms do not consider expansion of their businesses during the next three years.

Respondents rated all factors related to ***human resources*** in the Eastern Cape as poor, except the availability of artisans and technically skilled labour that were fair and unskilled labour that was available abundantly. The worst factors were inefficient civil servants, high labour costs per worker, and low work ethics and productivity of the labour force.

Aspects of ***physical resources*** limiting competitiveness most are low scientific infrastructure and the high cost of capital. All other factors are seen as fair. The strongest factors are telecommunication services, the application of modern technology, access to finance and the sophistication of the financial and banking sector although still rated as fair.

Export opportunities for firms in the Eastern Cape are good but respondents rate all other ***demand conditions*** as poor. The worst factors are low government demand, population growth, and HIV/AIDS, the structure of local demand and low levels of sophistication among consumers.

The strongest factors enhancing competitiveness with regard ***related and supporting industries and institutions*** are membership of business associations, although contact with organisations and firms in other countries are poor. Other factors that received a poor rating by respondents in the Eastern Cape are

poor government interventions and legal institutions, followed by low government competence and poor policies.

The strongest ***firm strategy, structure and rivalry*** factors are the co-operation that exists between Eastern Cape manufacturers and their clients and suppliers and the quality of their managerial practices. The worst factors are low employee performance incentives, an inability to enter foreign markets and low growth in profits.

Most factors relating to ***technology and innovation*** in the Eastern Cape are rated as fair, especially their application of computers in the production process and upgrading of their input mix and production processes. Research within the firm creating innovations and new technology and the utilisation of technological and knowledge spill-overs from other firms are, however, poor. The quality of inputs used is rated high and the ***quality*** of their products, both for the local and international market, are seen as good. Pollution by manufacturers in the Eastern Cape is, however, a problem. Cost involved complying with environmental legislation is high, while legislation concerning environmental protection is unclear.

Most landlocked provinces have a competitive disadvantage being so far from the coast, but this does not seem to benefit the Eastern Cape Province much as they rated their availability of harbour facilities and ocean freight services as poor and transport costs to be high. Import tariffs and other international trade restrictions also present obstacles. The quality and availability of water, electricity and other utilities, main road links, courier and container services, corporate financial services and the availability of health services are all regarded as good. The worst factors ***relating to location*** are low investments from abroad, little government aid and incentives, and inefficient cold storage facilities and international airport facilities. Only 11.1 per cent of the responding firms in the Eastern Cape knew about any SDIs and IDZs in their vicinity and of those none considered it to present any advantage to their businesses.

Individual manufacturers also suggested several other types of industries, which they presume would do well in their industrial areas. Some of these include the manufacturing of blankets, textiles and shoes in the Eastern Cape, food and beverages. Motor vehicle related engineering and outsourced services have large possibilities in the Eastern Cape as well as steel works, especially steel, rods and auto component manufacturers.

The ***perceptions and expectations of business conditions and costs*** of Eastern Cape manufacturers are unsatisfactory and deteriorating, and political and policy stability is regarded as poor. The best factors

are raising export volumes and orders, which respondents believe will continue. Local orders and sale volumes are, however, expected to decline in the near future. Average sales prices of output are rising, as the average purchasing price of raw materials is also rising rapidly and respondents expect this trend to persist. Eastern Cape manufactures do not experience any shortages currently, except for skilled labour, excluding managerial staff. The availability of raw materials is deteriorating though and also that of maintenance and support services, skilled and semi-skilled labour. The only other factors that hamper operations of manufacturers in the Eastern Cape are low market demand and high short-term interest rates and municipal taxes, levies and permit costs, which respondents also believe will increase slightly during the next twelve months.

5.5.6.6 Competitive Platform of the Western Cape Province

Competitiveness of manufactures in the Western Cape Province seems remarkably lower than those provinces discussed above when figure 5.15 is considered. This is unexpected as the Western Cape is a large contributor to South Africa's GDP. Being the place where colonialisation started in South Africa the average age of those firms that participated in this survey were also the oldest of all provinces, ranging between 50 and 101 years of age and averaging 71.3 years. The responding firms were remarkable small though with an average employment of 21.7 persons, no annual turnover exceeding R10 million and average annual overheads of only R1.13 million.

Although many activities in the Western Cape are very labour-intensive, ***human resources*** are not very well developed and all the factors considered in the survey ranged between poor and very poor. The most severe problems are the unavailability of managerial staff and artisans, while the availability of unskilled labour was rated best although it is still poor.

Even though the Western Cape has many tertiary institutions, scientific infrastructure is poorly developed according to respondents and firms have poor market and product information. Factors related to ***physical resources*** that are poorly developed are air and sea transport networks even though the province has some large airports and a long coastline. Respondents also rated harbour and ocean freight facilities as failing. Assess to finance was the factor rated strongest although the cost of capital is poor, the levels of short term interest rates deteriorating and this trend expected to persist during the following twelve months.

Low government demand and the effects of HIV/AIDS are the factors weaken ***demand conditions*** most. The strongest factors are the size of the local market and export opportunities to Africa and the Middle East.

Respondents rated ***related and supporting industries and institutions*** in the Western Cape very low. Their dependence on imports and contact with other organisations and firms overseas are very poor and government interventions and policies too. Sub-contracting was rated as very poor by the respondent firms and all indicated that the manufactureof the whole product and flexible production are thus nearly non-existent in the Western Cape. As it was seen in the previous chapters of this thesis, some firms in the province do utilise modern technology, this fact might be limited to the firms that responded to the survey and be due to the fact that only smaller firms in the Western Cape participated in this survey. In fact, linkages to technology, information, exchange of research, joint solving of problems and co-operation were the only factors rated as fair by respondents.

Employee performance incentives was the ***firm strategy, structure and rivalry*** factor rated best, with a very low standard deviation (0.58), followed by client co-operation and managerial skills and practice that was rated fair. Co-operation with government, the inability to enter foreign markets and to enjoy export growth are the largest factors depressing competitiveness. New innovations within the firm were the strongest factor related to ***technology and innovation,*** although specific research within the firm creating innovations and new technology is rarely done. While all the firms responding have access to internet and e-mail their utilisation of the internet and computers in the production process are poor. The ***quality*** of production output in the Western Cape is rated between fair and good, both for the local and world market. Pollution in the production process is a problem though and the costs to comply with standards and ***environmental*** legislation high. Respondents also indicated that legislation and guidelines for environmental protection are lacking and unclear.

Although the WCII is a SDI where much development has already occurred none of the responding firms are aware of any SDIs in their vicinity. None therefore saw any advantage from SDIs. The best factors related to ***aspects of location*** were the reliability of the telecommunications services, availability of semi-skilled and unskilled labour and housing for key personnel. The availability of support services and trucking is also rated fair, but a shortage of cold storage facilities, container services, the distance from suppliers of spare parts, low levels of foreign investment, high import tariffs an other trade restrictions, rates and taxes all causes serious problems.

In the wood and furniture industries joiners are required in the Western Cape, where winemakers also need more bottling plants. It was suggested by some respondents that these industries could also ***link*** to quality cupboard manufacturing.

Perceptions and expectations of business conditions and costs of responding firms in the Western Cape are marginally better than in other provinces, but still unsatisfactory and political and policy stability are rated as poor. It is, however, expected that business conditions will improve in the near future. Local sales volumes and orders are increasing and delivery periods are improving. The prospects for investment in new capacity, machinery, equipment, land and buildings over the next twelve months are positive for all respondents in the Western Cape. Slight shortages in raw materials and all levels of employment present problems. Most production costs and taxes are escalating and it is assumed that this trend is going to persist at least over the next twelve months. This includes the availability of medium term finance, the cost of credit in general, and especially the level of short-term interest rates, which cause slight problems and are expected to escalate.

5.5.6.7 Competitive Platform of the Northern Cape Province

The number of responses in some provinces was not enough to be of any significance. Report on the manufacturers of provinces where responses were less than five per cent, like Northern Cape and Limpopo (see figure 5.5), cannot be generalised for that particular province, and is only given here for the sake of comprehensiveness and should purely be interpreted as an academic exercise. On average, those manufacturing firms in the Northern Cape that participated in the survey have about 310 employees and half of them have an annual turnover in excess of R10 million. These firms are solid establishments aging between 45 and 65 years but as can be seen from figure 5.15 they are on average of the least competitive in South Africa. ***Quality*** of production output was the only category of factors that were rated as fair by respondents of the Northern Cape; all other categories were rated as poor.

Inefficiency of civil servants and a lack of available technical staff are the poorest ***human resources*** factors followed by a shortage of artisans and managerial staff; an absence of vocational and industry related training facilities, and a workforce with a low ethics and low productivity. The only aspects rated between good and excellent is the supply of unskilled labour.

Availability of suitable land is the only ***physical resources*** that the Northern Cape has in abundance, while the cost of capital is reasonable and market and product information are fair. Only halve of the

respondents have access to e-mail and internet and they rate their utilisation of the internet and computers in the production process as poor. Being landlocked, the Northern Cape sea and air transport networks and the cost of transport present huge problems; and being far from any universities, research facilities, resources, and support services and scientific infrastructure are failing manufacturers in the Northern Cape. Membership from business associations, and the utilisation of sub-contractors and ***support services*** are, however, rated as fair. Half of the responding firms specialise in the manufacturing of only part, or a phase, of the final product, which indicate large co-operation within their manufacturing networks. Although government interventions are rated as fair, government competence and policies are poor while government aid and incentives are regarded as failing.

All ***demand conditions*** in the Northern Cape are rated between poor and very poor by responding firms. Export opportunities, low government demand and the effect of HIV/AIDS are considered to be the worst factors. Concerning ***firm strategy, structure and rivalry,*** co-operation with clients are rated between good and excellent while co-operation with suppliers is fair. All other factors are rated as poor and co-operation with the government is very poor. Investment in new production technology and new innovations within firms are fair but these innovations are rarely further developed and patented. Research within firms are, however, very low and technological and knowledge spill-overs from other firms are rarely utilised. All other factors related to ***technology and innovation*** is rated as poor.

The costs of telecommunication services and the reliability of water and electrical supply, courier services and personal contact with customers are ***aspects relating to location*** that are rated between good and excellent by responding firms. Next to air, harbour and ocean services, the availability of container services, proximity of support services, the availability of raw and semi-processed materials, and the availability of other manufacturing firms within the industrial districts, business support services, and international tariffs and other trade restrictions are all failing producers in the Northern Cape. On average, aspects relating to location are rated as poor in the province. Some respondents in the Northern Cape identified industrial ***linkages*** in the form of lead flotation plants that are needed to purify copper concentrate.

Business conditions in the Northern Cape are considered to be unsatisfactory and the political and policy stability very poor. Sales and orders are declining and the trend is to continue during the following twelve months. Sales prices are rising and so are the price of labour per unit of output and this is expected to continue to rise. The availability of labour, water and electricity are deteriorating and slight shortages are experience of skilled labour and managerial staff, machinery, equipment maintenance and support services,

as well as technological and knowledge support services. Problems with market demand; lead times for expatriate work permits, and import dumping on local markets are deteriorating and hampering activities slightly. Interpretation of tax laws also presents some problems and it is expected that tax structures and access to raw materials are going to limit their ability to invest during the following twelve months. During that time the volume of goods internationally traded are expected to decline and investment in machinery, equipment, land, buildings and new capacity in general are expected to decline in the Northern Cape.

5.5.6.8 Competitive Platform of the Free State

There is a good dispersion of responding firms from the Province of the Free State when annual turnover is considered. Only 42.9 per cent of the respondents had turnovers above R10 million and the number of employees ranged between five and a hundred, averaging 35.1 workers and average annul overheads of R4.5 million. The age of these firms averaged 21.4 years and none were older than 45. Competitiveness of firms in the Free State seems to be lower than average when figure 5.15 is studied. Supporting services seems to be remarkably low but human capital and technology looks fair.

Respondents rated ***human resource*** factors on average to be fair. The strongest factors are the availability of unskilled labour and artisans, while the availability of technically skilled and managerial staff are poor. The efficiency of civil servants is rated as very poor and low work ethics and the absence of training facilities decreases competitivety.

The availability of suitable land is the only ***physical resource*** factor rated as good by respondents followed by electrical and telecommunication services and a well developed financial and banking sector that are rated as fair. The cost of interest rates is, however, a problem and high interest rates are expected to persist during the following twelve months. The worst factors are very poor access to air and sea transport networks that leads to very high transport costs. Traffic at boarder posts and harbours is a matter of concern while support from trade and business associations is virtually non-existent.

Demand conditions and ***related and supporting industries and institutions*** are all rated as poor except government competence, which is rated as very poor. Local suppliers were the factor rated as best but still poor. Co-operation with competitors scored the lowest among ***firm strategy, structure and rivalry*** factors, followed by co-operation with the government. The best factors enhancing competitiveness in this category are co-operation with clients and managerial skills and practices.

In the category concerned with ***technology and innovations*** the use of cell phones is rated as good followed by fair investment in new production technology, new innovations within the firm, and fair upgrading of their production processes and input mix. The utilisation of computers in the production processes and research within Free State firms are, however, poor. Only half of the firms have access to the internet and market and product information are poor, indicating inadequate competitive intelligence by the responding firms of the Free State.

Respondents rate the ***quality*** of their products and the material inputs as fair, but the quality of products intended for the export market are poor. Cost to comply with standards is high and ***environmental*** protection legislation and guidelines are very poor.

Only 14.3 per cent of the responding firms in the Free State are aware of SDIs and none thought that it presented any advantage to their operations. Being a landlocked province, airport and harbour facilities present a huge problem together with high import tariffs and other international trade restrictions and very low investment from abroad. As the Free State is landlocked, an advantage point to the province is the good proximity to main road links and railheads and the availability of trucking and container services. The quality and reliability of water, electricity and other utilities are rated high, semi- and unskilled labour are in good supply and the availability of housing for employees and key personnel are good. Other factors ***relating to location*** that presents problems are the lack of aid from government and other incentives, high rates and taxes, the unavailability of cold storage facilities, the distance from markets, local environmental considerations, the cost of telecommunication facilities and high investment risk.

Although the utilisation of sub-contractors and supporting services are poor, 42.9 per cent of the respondents indicated that they specialise in the production of a part or phase of the final product. The availability of other manufacturing firms within the industrial districts is poor and technological and knowledge spill-overs from other firms are not utilised, but their specialisation might lead towards more sophisticated ***flexible production*** in future. Other possible manufacturing activities that could be established in the vicinity of their existing plants in terms of further processing and ***linkages***, suggested by respondents, included enhancement of mining products, the manufacturing of heavy industrial products and the treatment and recycling of waste material. High technology metal castings and plastic bags were also noted as well as agro-industries in the Free State, like components for agricultural machinery and storage facilities especially for agricultural and agro-industrial products.

Perceptions and expectations of business conditions of respondents are unsatisfactory and political and policy stability are poor. The average purchasing prices of raw material are escalating, its availability is deteriorating and slight shortages often occur. Local sales prices of products are also increasing rapidly, having a negative effect on market demand and this trend is expected to continue in the near future. The availability of machinery, equipment, maintenance and support services are also deteriorating. Other factors that are hampering the activities of manufactures slightly are lack of demand, municipal taxes, levies and permit costs, bribery and corruption and a non co-operative civil service. The negative effect caused by the lack and cost of credit and tax structure is expected to persist during the following twelve months.

5.5.6.9 Competitive Platform of KwaZulu/Natal

Three quarters of the firms in KwaZulu/Natal that responded to this survey were large firms with an annual turnover in excess of R10 million, average employment of 567.5 workers and annual average overheads of R37.7 million. All responding firms were older than six years averaging 27. Looking at figure 5.15 gives the impression that KwaZulu might be the most competitive province in South Africa. It rates the highest on human capital, physical resources and product quality and only demand are rated poor on average, due to high market or sales prices, low government demand and the effects of population growth and HIV/AIDS. All other factors relating to demand and export opportunities ranges between fair and good.

Respondents in KwaZulu rated all factors relating to **human resources** as fair except the availability of unskilled labour that ranged between good and excellent. Wages, work ethics and productivity do have some negative effect on competitiveness though. The efficiency of the civil service and relations between the government and manufacturers in KwaZulu seemed better than in most other provinces, although all manufacturers would prefer more aid and incentives from government.

Physical resources all ranged between fair and excellent. The only factors rated as poor were the importation of inputs and the cost of capital. The availability of credit and interest rates does not, however, present problems and it is not expected to limit investment decision during the following twelve months. KwaZulu/Natal seems to be the only province to gain from their proximity to the sea. Respondents rated their sea transport network, the availability of harbour and ocean freight facilities ranging between good and excellent. In fact, most factors related to their location were rated very high. Other aspects of physical resources rating high are telecommunication services, support from trade and business associations, and their application of modern technology.

Dependence on imports and poor local suppliers are the only factors in the category of ***related and supporting industries and institutions*** that are considered to be poor, all others are fair. Sub-contracting of other manufacturers is rated between fair and good, while the utilisation of supporting services; government competence and the quality of the legal institutions are enhancing competitivity in KwaZulu.

Respondents in KwaZulu rated factors of ***firm strategy, structure and rivalry*** between fair and good. Managerial skills, practices and business contacts are regarded as good and so are their co-operation with clients and suppliers and their employee incentives. Most factors concerning ***technology and innovation*** are rated between fair and good. Their use of cell phones and other modern communication technology are good. All responding firms have access to the internet and e-mail and their market and product information are good indicating some proficiency in competitive intelligence. They upgrade their production processes and input combinations regularly and continuously find new innovative applications of existing technology. No aspect relating to technology and innovation received a low or poor rating.

Manufacturers in KwaZulu rate the ***quality*** of their production output as high, both for products intended for the local and international markets, and they utilise materials of good quality. Manufacturing emissions of pollutants are fair but the costs to adhere to production standards and ***environment*** legislation rage between fair and high while the legislations and guidelines are unclear.

Some of KwaZulu's strongest factors ***relating to location*** are its proximity to main roads, excellent airline facilities (harbours were already mentioned), reliable water, electricity and telecommunication services, and proximity of supporting, professional, and corporate finance facilities. Aspects that undermine competitiveness are the high cost of industrial land, low investment from abroad, low government assistance, the unavailability of other manufacturing firms in the industrial districts, cold storage facilities and high rates and taxes. Most firms do not consider expansion within the next three years but when they do it would probably be at the same location where they are now. Respondents identified ***linkages*** and potential for sweets manufacturers and wood pulpiers for the manufacturing of packaging material in KwaZulu/Natal, and also saw the need for cross-linked foam, transport and courier services.

Even though the availability of other manufacturers in the industrial districts of the responding firms in KwaZulu is limited, half of the respondents indicated that they do specialize in the production of only a part or phase of the final product. They also do utilize sub-contractors and other supporting services fairly well and technological and knowledge spill-overs from other firms are utilized fairly well, which implies

some measure of ***flexible production***. The main elements of the ***new economic geography*** are all present in KwaZulu to some extent contributing to their competitivity. They have a fair pool of skilled labour, intermediate inputs and technological and knowledge spill-overs, while historical factors and transport cost advantages also enhance the competitiveness of the province.

Firms in KwaZulu also perceive ***business conditions*** and political and policy stability to be unsatisfactory, but not as bad as in the other provinces. Local and export orders and sales are down and the trend is expected to continue. Average costs per unit of production for raw materials, labour and total costs are escalating and increases are expected to continue. This survey was also conducted before the high production inflation figures of 2002 were published. This might have aggravated their expectations regarding production costs and business conditions.

Manufacturers in KwaZulu are not experiencing any shortages currently and do not expect this situation to change in the near future. The lead time for expatriate work permits and import dumping on the local market are deteriorating and this together with the decline in demand are hampering manufacturing activities slightly. With the expected decline in business conditions and lower demand during the following twelve months, firms do not consider investment in new capacity during this time. Tax structures are also expected to limit the ability of firms to invest within this period.

5.5.6.10 Competitive Platform of the Limpopo Province

Competitiveness of firms in the Limpopo province seems to be very low when considering figure 5.15. On average factors relating to ***human resources*** are rated as poor. The availability of unskilled labour is excellent and technical staff is good but artisans and managerial staff are unavailable. Civil servants are considered inefficient, while low work ethic, low productivity, high wage rates and the absence of training facilities provide serious problems.

Respondents in Limpopo rate most ***physical resources*** as very poor. Suitable land is available in abundance and the cost and reliability of electricity and telecommunication services are rated as good. Local market and government ***demand*** are very low and the population growth and HIV/AIDS have a large impact on demand conditions. The structure of local demand is sophisticated but the market is already well differentiated and saturated.

All factors concerning ***related and supporting industries and institutions*** are rated as very poor and only local suppliers and co-operation in the value chain and sharing of critical activities are rated as being good. ***Firm strategy, structure and rivalry*** factors are also rated as very poor. Only employee performance incentives and co-operation with competitors are rated as fair, while co-operation with clients and suppliers are perceived as good.

Most firms in the Limpopo Province have access to the internet and utilise cell phones and other modern communication technology fairly, but their market and product information are still very poor. They have poor contacts and networks with other manufacturers, no related industries in their industrial districts, poor utilisation of technological and knowledge spill-over and membership to business associations are nearly non-existent. This implies that the competitive intelligence of manufacturers in the Limpopo is failing. Other factors relating to ***technology and innovation*** that are rated as fair by respondents are their utilisation of computers in the production process and new innovations are developed and patented. Upgrading of their input and production mix is seldom done.

Manufacturers in Limpopo rates the ***quality*** of their products produced as being poor, both those produces for the local and international market. Materials used in the production prices are also poor and the costs of complying with standards are very high. The ***environment*** is being polluted during their production processes and the cost of complying with the environmental legislation is very high while legislation and guidelines are vague and unclear.

As explained above the responding firms are not involved in flexible production and final products are made without any specialisation. No export opportunities are currently considered, as most factors ***relating to location*** are rated as failing. Of the worst locational factors are the environmental protection legislation, the high cost of water and the unavailability of industrial training facilities. Being far from the sea, airports, and railheads, all these factors related to proximity and availability is to the competitive disadvantage of most firms in Limpopo. For this reason respondents consider the development of SDIs as an asset to their activities. All respondents in Limpopo indicated that SDIs enhanced their manufacturing activities and led to increasing returns and/or economies of scale and scope.

Positive factors relating to location in Limpopo that are rated between good and excellent are the quality and proximity to main road links, availability of courier services, industrial land, schools and colleges, housing for employees and key personal and the cost and high quality of electricity and communication services.

Limpopo firms are the only ones that regard ***business conditions*** as satisfactory and feel that political stability and policy have no influence on them. Respondents find it difficult to enter international markets and export growth is dwindling. They expect that this trend will persist in the coming months but expect local orders and sales to expand. Fixed investment is, however, declining and will continue to do so as the prospects for investment in new capacity are expected to remain constant. Investment in land and buildings is expected to decline during the next twelve months, but investment in machinery and equipment is going to expand during the same period. The lack and cost of credit is going to have a serious effect on companies' ability to invest and inefficient demand and tax structures will also present a slight limitation. Short-term interest rates and the availability of medium- term finance have a serious effect hampering manufacturing activities and respondents expect this situation to continue.

5.6 SUMMARY AND CONCLUSIONS

This first part of this chapter utilised various studies that were undertaken in the recent past and databases that currently exist to determine how competitive the various regions and industries in South Africa are. The chapter first studied the methodology that IMD, WEF and AT Kearney employ to determine the various indices. Emphasis was given to the World Competitiveness Index, the Global Competitiveness Index and the Globalisation Index. The problems that exist when these indices are determined and criticism that are expressed, were then discussed.

The following section considered the competitiveness of South Africa by studying the provincial cluster potential that was identified in the various provinces, linkages and competitiveness identified by the RILS study and the local comparative advantages of the various regions and municipalities that can be derived from PIMMS database. This gave a picture of the country's competitiveness on a national, provincial, regional, industrial and local level. The same methodology was followed in the next section.

The last section considered competitiveness and focused especially on the obstacles to competitiveness on a national, provincial and local level by considering various surveys. The National Enterprise Survey was first considered and the World Bank Survey on the Greater Johannesburg Metropolitan Area was considered.

The second part of the chapter reported on a survey on the competitiveness platform of South African manufacturing firms. The study commenced by reporting the results of the responding firms that were received. This was followed by a study of the competitiveness of firms differentiated according to firm size, according to the nine provinces, and according to the ten major manufacturing sub-sectors.

This survey highlighted the reliability and quality of communication services, electrical supply, water and other utilities, which are rated very high by all respondents. The study revealed much detail, like the need for cold storage facilities that presents a problem to nearly all manufacturers, most firms experience a shortage of artisans and there exists a need for more training facilities, especially for vocational and industry related training. Respondents rated harbour and ocean freight facilities as failing. It was also seen that although distance from the sea presents a competitive disadvantage to landlocked provinces, firms that have a long coastline do not gain competitive advantages from it. KwaZulu is the only province that enjoys some benefit from its harbours. The same applies to the province with large airports.

Poor perception of the government and the civil service was the strongest factor depressing competitiveness according to the respondents of this survey. Manufacturers see civil servants as inefficient, the civil service as non co-operative and the government as incompetent. Unsatisfactory business conditions are mainly ascribed to government action, policies and interventions. Irresponsible political conduct by the government and policy instability cause investment risk to deteriorate, business confidence and foreign investment to decline, which leads to sustainable deterioration of business conditions, pushing up costs and prices while the local currency continually depreciate.

Very few respondents were aware of SDI developments in their vicinity, highlighting that government's communication network in the country is inefficient. Firms feel that the government should provide all kinds of subsidies, aid, incentives, loans and other support, including managerial skills and investment support, if the government is sincere in its effort to stimulate industrial development, economic growth and job creation. Currently respondents indicate that such assistance is lacking. With the GATT agreements and stipulations of the WTO this is a major problem, but manufacturers feel that government has to do something to level the playing field. Industrial standards, workplace regulations and laws, and environment protection legislation and guidelines are seen as very costly and mostly lacking and unclear. It is important that guidelines, regulations and legislation are clear and explained to all involved.

On the firm level it was found that firms are proficiently producing new innovations within the firms but neglect the further development and registration of such new patents. This is a problem with most

manufacturers. If more could be done to assist companies in this regard, it would improve the competitive platform of the whole country. New innovations can produce technology that is better suited to the local situation than imported technology, and improve profit growth and employment.

It was found that competitiveness increases with firm size. The most competitive provinces are the North West, KwaZulu and Mpumalanga. Although Gauteng is the largest contributor to South Africa's GDP it is not the most competitive. Each province has its own set of problems but those stated above occur in all. It is logical that rising costs would also present problems to all. Rising input costs, taxes and high interest rates are of concern to all firms and none expect the situation to improve in future. When the competitiveness of ten major manufacturing sub-sectors was studied it was found that the competitiveness of the different sub-sectors is about equal. No industry was significantly more competitive than others and no sub-sector much weaker than others. Food processing and transport equipment manufacturers seem the most competitive, but the others not much worse. An alarming aspect was the low level of technological proficiency, expertise and innovation in the science- and technology-based industries like chemicals and electronics. If South Africa is to prosper in the new economy, its level of technological expertise, capabilities and capacity will have to be improved considerably.

No factors regarding the competitive platform were on average rated as good or excellent. High and rising labour costs were a point of concern, together with workplace regulations, unproductively, and low work ethics of the workforce with regard to motivation, neglect and conscientiousness. More investment in human capital is very important in order to improve productivity and competitiveness.

Local demand conditions are unsatisfactory but it is assumed that this problem can only be addressed in the long-run following industrial development and job creation, but also economic development of the people in all facets of their lives including income equity, education and better health to name a few.

Although infrastructure, roads, and railway networks are well developed firms often find it difficult because links and railheads are too far from their premises. Proximity and availability of airports and airport facilities is also a problem, it presents serious problems, especially in some provinces and particular industries. Supporting services are still absent in many areas and where they do exist it is not sufficiently utilized. Most manufacturers do specialize in the production of a particular part or phase of the final product but evidence of modern flexible production is still absent. The level of expertise in and access to modern production technology and innovations found within firms were much higher than expected from a less developed country, especially those manufacturing transport equipment, but still, the county's

technology platform is on average only rated as fair and disappointingly low in those science and technology-based industries that need it the most like electronics and chemicals.

Firms do not experience serious shortages of any kind except with raw and intermediate materials and some levels of skilled labour that sometimes causes slight problems. In most places the pool of skilled labour is inadequate, intermediate inputs are sometimes difficult to find, non-tradable factors do not enhance competitiveness adequately and technological and knowledge spill-overs from other firms are poorly utilised. On the Porter Diamond, input factors do not present serious obstacles, except those mentioned above, demand conditions are poor, firm strategy, structure, rivalry and management are rated between fair and good while support services and institutions are inadequately provided and not sufficiently utilised.

The study calculated competitive indices for the nine provinces of South Africa, the ten sub-sectors of manufacturing and the various firm-sizes. The most important value of these indices was that it confirmed the information obtained from the analysis of the questionnaire, and the sub-sectors provided additional insight and information about aspects like economic performance, internationalisation, productivity, government and institutions, business efficiency and management. It was confirmed that competitivity rises with firm size. The most competitive provinces are KwaZulu Natal, North West and Mpumalanga, while food processing, transport, textiles and furniture are ranked as the most competitive industries with the highest competitiveness indices. Provinces or sub-sectors that rank high in the total competitiveness index usually also perform well in the sub-categories, while those with weak indices also perform below average in most sub-categories as well.

The significant Cronbach-Alpha values suggest that the response from firms is significant. When considering the theory of production in chapter 2 it was shown that the most important aspect in enhancing industrial competitiveness was in addressing the cost structures of firms. An important extension to this study will be the calculation of cost competitiveness like the studies done by Siggel (2000 & 2001), Van Seventer (2002) and Van Seventer & Molate (2002). These studies could, however, be contradictory and focus only on productivity as comparative unit cost ratios are calculated as the ratio between total costs and the value added (Siggel, 2000:13). A problem when determining cost competitiveness is the availability of detailed data and the estimation of shadow prices.

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CHAPTER 6

SUMMARY AND CONCLUSIONS

6.1. INTRODUCTION

The ability of the South African competitiveness platform to support and promote industrial development in South Africa was studied in this thesis. Manufacturing was identified as an engine of growth and received the main focus of this study. South Africa has economic challenges typical of a less developed country (LDC). About half of the population live below the absolute poverty line, income distribution is the worst in the world and about one third of the workforce is unemployed. The creation of employment is generally seen as a possible way to create income and increase the welfare of people. Ordinary work programmes are too expensive and would not be sustainable. Government expenditure causes various negative externalities like rising interest and higher inflation rates, which eventually harm the people that the expenditure was supposed to help. Industrial development on the other hand is regarded as a profitable and sustainable way to create employment and economic development to all. Industries will, however, only succeed if there is a sustainable demand for their products and services and this is only possible if industries are internationally competitive. This puts the emphasis on the improvement of the competitiveness platform in South Africa.

Chapters 2 and 3 gave attention to the theory of industrial development and policy. It focused on the theory of industrial policy and practice in chapter 2, and considered spatial aspects of development focussing on industrial location in chapter 3. The different components that are usually included in industrial policies, how countries set about acquiring the necessary elements of a competitive platform and the experience of the fast growing Southeast Asian economies were studied. Chapter 4 then studied the policy framework of the authorities, which has an influence on the South African competitive platform and industrial platform. In Chapter 5 the competitiveness and obstacles to industrial development investigated by studying previous surveys, reports and databases of research already done in South Africa. The last section of chapter 5 then reports on an empirical analysis of a survey that was conducted during 2002 among manufacturing firms throughout South Africa. The first

the study that covered the theory on industrial development and competitiveness will now be discussed below.

6.2 THEORY AND PRACTICE OF INDUSTRIAL DEVELOPMENT AND COMPETITIVENESS

The study commenced with an investigation into the theory of production and industrial policy. It was shown that industrial development requires a shift in the long-term supply curve towards a higher economic equilibrium. This will create employment and can capture a larger share of world demand on a sustainable basis. For such a shift a stable and supporting macroeconomic environment is necessary. Interest rates and the exchange rate must be stable and not over valuated. This study has shown that demand conditions in South Africa are not conducive to industrial development and eventually the market becomes saturated and industrial development reaches a ceiling. This highlights the need for international trade and international competitiveness.

International trade also provides a source of modern technology, knowledge, investment funds, credit, and various other positive externalities that is necessary for industrial development. International trade is only possible if firms align their cost structures, prices and quality in accordance to international standards. This will make local firms more efficient and productive and ensure development of local industries. It was shown that growing global trade could create employment, raise welfare an increase living standards. The value of an export-orientated policy was illustrated and contrasted with import substitution. The value of imports for industrial development of less developed countries was also considered. Strategic trade policy and market protection was considered. Tariffs were shown to be sub-optimal policy, and the removal of trade restrictions will at least in the short and medium-term lead to higher economic growth and welfare. Market failures do, however, often force authorities to apply second-best policies in less developed countries.

The aim of industrial development policy should be to move the individual marginal cost curves of individual firms permanently to the right as these adds up to create the market supply curve and it is in the first instance firms that compete and not countries. This requires the enhancement of productivity in individual firms and lowering of their cost structures. It was shown that industrial policies could be applied to the existing theory as it can have an effect on cost and competitiveness of firms. The theory of industrial policy is not a separate theory, but is in the first instance economic theory showing what the influence of the authorities could be.

Attention was also given to resource allocation and the choice of factor intensity. It was shown that proper research on the specific situation is necessary as capital-intensive production technology could also be an advantage to a less developed country with an abundant supply of unskilled labour where labour-intensive production is usually preferential. Capital formation is important to less developed countries as there is usually a scarcity of capital and modern technology and higher efficiency is mostly embedded in capital goods. This section also indicated the value of technology and innovation for industrial development. Economic theory predicts that output and industrial development could be increased disproportionally in relation to the input factors of production when modern technology is applied.

To move the marginal cost down and to the right requires production to address supply conditions, making production cheaper and more productive. Government policy can, for instance, improve infrastructure that would lower transport costs, the availability and costs of raw materials, and capital goods could be addressed, financial assistance could be provided, regulations on labour could change wage costs, and the average price level could decrease production costs to name a few. The most important aspect of industrial policy would be to assist firms in the utilisation of modern technology. The productivity of the factors of production of firm's will increase with the acquisition of:

- Higher technology embedded in capital goods and
- Higher skills and knowledge embedded in labour enabling it to handle modern technology.

Considering the theory of production it was shown that the productivity of both capital and labour should improve simultaneously as production factors are complimentary to each other. When production can increase while prices remain constant or preferably decline, it will create employment and create sustainable wealth.

The second chapter gave a rationale for governments to implement industrial policies. In South Africa and other less developed African countries, economies are characterised by market failures, market imperfections, inefficiency, risk and uncertainty and a lack of private initiative often leading to the absence of markets. This puts a responsibility on the governments to address these market imperfections in order to move the economies and firms operating in those economies towards the point where the markets could work as free competitive markets. The objective of industrial policy should thus be to attempt to transform the LDC economies into perfect functioning free market capitalism. As economic development is only achieved in the long-term, this objective cannot be realised immediately and the theory of second best will often force policy makers to intervene in the economy along the development process. Government policy has to address these failures to the point where they could leave the economy on its own, but until that point is reached government interventions would be required.

The advantages of international trade and globalisation are often emphasised without considering any problems that it can cause. The study then considered quandaries in trade and industrial development policy. The static and dynamic effects of international trade was then noted as well as factor mobility, and policy dilemmas such as the choice between efficiency and equity. This section considered various criticisms sometimes expressed against industrial development, especially development with a trade focus. Special attention was given to the fact that global trade could harm the poor and the unskilled.

A stable macro-economy is essential for the micro-economic production and development of firms within an economy. The role of fiscal, monetary and financial policies in support of industrial policy was discussed followed by a section on exchange rate policy. It was shown that a devaluation of the exchange rate and a consistent macro-economic policy is required in the case of most LDCs. Firms cannot be internationally competitive if inflation causes them to be priced out of the market, inflation should therefore be addressed to obtain and maintain international competitiveness. Price control was also discussed followed by aspects of foreign investment, multinational corporations and the advantages and disadvantages of privatisation were noted.

It was illustrated in this chapter that industrial policy will not function in practice as the theory predicts if other related issues are neglected. Industrial policy cannot stand alone, but should involve various other policies and state departments in an integrated strategy. Better utilisation of modern capital goods requires a pool of skilled labour, which is the responsibility of the Departments of Labour and the Department of Education and Training, for example. An integrated strategy would require the participation of all role players and a well-planned propaganda effort will be to some advantage in getting everyone to participate in the building of the economy.

Globalisation, the new economy, and modern technology are changing the international competitive regime by altering the way production and marketing are conducted. Globalisation has a significant potential and influence on industrial development and the way policies and strategies are formulated to handle these new developments. Industrial development policy has to take note of modern global developments, and should be designed to exploit that to the full extent. Globalisation was studied in the first chapter demonstrating the rational for this study.

Globalisation is transforming the world from the industrial age to an information age with definite effect on cost, production and markets, creating a new global hierarchy and altering the spatial geography. This has an influence on industrial competitiveness.

The development of competitiveness, the driving forces behind it, and how it is enhanced were studied. The competitiveness platform, the stages of industrial development and Porter's approach to competitiveness were then studied in chapter 2. The next part of chapter 2 considered the components that are usually included in industrial policies, the ways they build their competitive platforms, and the success countries experienced. This chapter has shown that need for industrial policy still exists in the new globalised economy. It was shown that industrial policy could be divided in the categories of:

- Active interventions and incentives
- Functional policies
- Selective interventions.

Traditionally, active interventions and incentives formed the main core of industrial policies. Following the endorsement of the GATT agreements at Marraches in 1995 the international paradigm shifted in favour of trade liberalisation. Government actions are being restricted and active interventions and incentives cannot be applied as before. At the same time, modern technology that includes communication, computer and information technology and engineering expertise is advancing the effect of globalisation. The movement of goods, services and information are being accelerated, regardless of national borders and all these developments are rendering governments powerless to manage trade and industrial development through traditional means. The contribution of industrial policy to development does not, however, consist only of subsidies and trade restrictions. There are more that the authorities can do to promote industrial development.

What is required is the designing of smart policies that can utilise the advantages of globalisation and liberalisation in their favour. Regional industrial policy must strive actively to develop modern technological competence in that region so that it would be able to compete on the international platform. Less developed countries should not only be able to absorb Western technology, but have to develop their own and preferably reach the stage where they are the new innovators of technology themselves.

Countries that already use modern technology and find themselves in the innovation-driven stage of competitiveness enjoy increasing returns to scale. This could imply that the rich are getting richer and the poor even poorer. The intention of economic liberalisation is to improve the welfare of everyone in the world, and the liberal paradigm is built on the assumption that the income of all nations will converge to a higher level if the global economy was a perfectly free capitalist system. Whether that is possible in Africa with the large influence of modern technology and stronger global competition, is questionable.

A case was made out for the role of functional and selective industrial policies, but it also has limitations. Special attention was given to the lack of clear objectives, inefficient information, the lack of skills, inflexibility, agency problems, sectional interests and corruption that are often disadvantages associated with this type of policy interventions.

The focal point of industrial development policy must be to create an economic climate conducive to free economic activity. Assistance in finding information and obtaining funds are typical examples. But in today's global environment, most attention has to be given to making the industrial sector internationally competitive. The core of an economic development policy should focus on the development of skills and the acquisition of modern technology. This chapter therefore studied the acquisition of capacity, stimulation and financing investments in technological development and the technological infrastructure. The most important aspect here is the development of a skill base for modern industrial development. Much attention has to be given to education, training and the development of skills, especially in the scientific, technical and engineering fields.

Globalisation causes firms to face more competition in local and foreign markets. The pace of globalisation is tied to technological change. Declining computing, communications, transport and logistics costs; trade and investment liberalisation; and regulatory reform facilitate entry by new firms and diversified cross-border activities. This leads to new options for lower costs, better quality, more choices for consumers and new forms of exchange between countries, but also increases the importance for economies of being able to spur and adjust to change. Issues relating to firm competencies have to be addressed in a holistic and multi-disciplinary manner.

The theoretical factors that influence industrial location were surveyed in chapter 3. The main focus was on what the so-called *'New Economic Geography"* can contribute to industrial location theory in the context of the modern generation regional policies. The quality of labour, knowledge and social institutions has become fundamental in the explanation of spatial economic development.

The first section gave attention to traditional factors that are important when industrialists decide on a location to settle. In this section attention is given to the economic environment, services and essential infrastructure provided by the authorities, government regulations, the natural environment, and factors specific to the site, the corporate objectives and proximity to headquarters, uncertainty, ambience and quality of life.

To survive in the global economic world the optimal location is the one where manufacturing and marketing efforts will result in the highest gains. The location will affect the costs at which raw material

inputs are obtained, costs of production, wage rates, the power of the trade unions, personal and product transport, costs of marketing, and the amount of products demanded by the market. An optimal location has to be found between resources and markets, which will generate the highest possible profit margins.

The standard factors of the *"new economic geography"* of labour market pooling, supply of intermediate goods, and technological and knowledge spill-overs, forms the basis of this study in chapter 3. In this sections attention was also given to agglomeration, transportational advantages, and history. Manufacturers have to consider a combination of factors and make a thorough cost benefit analysis of all these factors before deciding on a location to establish a plant. The final outcome will have to be an optimal location.

The *"new economic geography"* abandoned constant returns and perfect competition. It gave new insight to economic spatial development and can also be utilised in less developed regions. The new economic geography literature confirms what economists were already saying in the 1930s and even Marshall in 1890. With the event of globalisation and the new economy those theories are still true and relevant, and should not be neglected. Economics today possesses the mathematical tools and *"technical tricks"* to handle spatial problems that were not possible in the past and it is now possible to shed more light on spatial science utilising new economics' mathematical models.

It was found that once a few companies had determined a profit maximising location, it becomes more profitable for others to locate in the same area. By clustering with existing companies, the benefits of the location are amplified by the benefits that the cluster or industrial district provides to every company at that point of growth. Companies interact with one another and their decisions influence each other. The interaction of companies lead to technological and knowledge spill-overs, higher innovation and at the end larger profits margins. At the agglomeration point of growth manufacturers can share in the benefits of shared infrastructure, a large labour pool, especially skilled labour, as well as specialised intermediate inputs and services that will move their profits even further.

Companies must strive to be most competitive and would select a location that would contribute to its' competitiveness. Clustering of manufacturers leads to competitive advantages as external economies of scale or location economies are achieved. Supplies of capital or service are often cheaper, for example. The agglomeration process reduces costs by lowering transport costs and maximising access to supplies, and enables companies to achieve increasing returns to scale. Large urban areas attract companies because of its infrastructure, urban amenities that include both cultural and recreational facilities, large and diverse labour pools, and the presence of educational and research institutions.

Chapter 3 also focused on spatial development patterns of a region and how it interacts with the development of manufacturing in a region. Attention was first given to the practical factors and the stages of the product cycle model. This introduced the stages that a geographical region goes through during development according to the regional cycle model. The last part of this section examined the spatial influence that new infrastructure, like a new highway, has on a region's spatial development patterns. Through its' influence on the locational decisions of firms it correlates with the factors that the literature of new economic geography regards as important for manufacturing development. The spatial development patterns in this instance are quite similar to the previous two sub-sections and are important when a spatial development strategy has to be constructed.

The role of policies in spatial development was also considered in this section. New generation policies are required to address modern patterns in manufacturing location. Mass production fordism had reached its limits and the era of smaller flexible production runs in industrial districts and networks has begun. The first generation policies were designed to assist neo-classical economic development patterns. In the majority of cases the assumption was that government intervention was necessary because economic growth did not occur simultaneously in all regions. The assumption further was that inequality would eventually decline in all regions over time. Policies were aimed at smoothing the playing field for all regions in order that regions can compete fairly in the free market. Policy objectives were to ease the mobility of production factors and remove monopolistic elements. The national government was the major role player in those policies. Regulations and financial incentives influenced the location of industries. The provision of infrastructure was viewed important to overcome regional disadvantages.

By the late 1970s and 1980s the opening up of national economies and the restructuring and internationalisation of production, which started to alter the regional economic landscape, led to scepticism about the effectiveness of traditional regional policy instruments and alternative regional development policies were searched for. Restructuring seriously effected growth point and core regions, while new growth regions emerged elsewhere known as industrial districts that were capable of competing internationally.

The objectives of second-generation regional development policies were to increase the development capacity of regions and to mobilise the specific resources and innovative abilities of regions in order to become internationally competitive. Instead of emphasising endogenous development, the focus moved to inter-firm co-operation, with business associations, unions and the government as a minor role player.

As the third millennium commenced it became apparent that regional productions system are now competing against each other instead of only companies competing due to globalisation. It was realised that third-generation regional development policies have to consider the positioning of regional productions system within a global context. Horizontal co-operation among a variety of actors has to be complimented by vertical co-ordination between levels, sectors, regions and internationally. Third-generation policies seek to enhance systems or systemic rationality in the utilisation of existing resources and programmes. Competitiveness does not only depend on company's own actions but also on that of their suppliers and the business environment. The collective efficiency, supporting systems, innovative milieu and industrial atmosphere is becoming increasingly important for the competitiveness of a region.

Government policies are shifting from direct intervention in firm behaviour like price control and foreign exchange allocations towards facilitating changes in structure and basic conditions, like infrastructure and the macro economic environment, leaving most actions to companies and business associations. The role of government is only seen as a facilitator in the background creating a climate for free and fair economic development with the objective to ease flexible specialisation, especially in industrial districts and networks. Most factors that attract manufacturers to a region also apply to the service industries.

The last section of chapter 3 studied recent research on spatial economics. It considered how and why spatial concentrations occur and develop. The economy is a system of cities created mainly by the actions of manufacturing industries and trade. It forms hierarchical structures and interacts with one another and the rural periphery. The same manufacturing and urban patterns of development are also applied in a global setting influencing and creating international trade and specialisation. This section surveys and summarises spatial economic development in detail and puts the preceding sections of the chapter in perspective. Modern research does not contradict traditional theories and new economic geography, but affirms it. It provides more insight in the role of manufacturing in the development of the spatial economic geography.

Knowledge about the effect of locational factors on the establishment of manufacturers in an area is important. It provides an understanding about the factors which could contribute to the creation of employment, especially among the poorer people of the country. Once growth commences at a new location or an existing one expands, manufacturers need more workers, skilled and unskilled, as well as more physical inputs from various other companies. These linkages and the higher demand for more factors of production causes those suppliers to expand as well. The higher income of the newly

employed workers and higher output of suppliers lead to higher demand in general in the region. The rise in private income together with the growth of industries will lead to the migration of more people and the establishment of more businesses in an area and its surroundings, increasing the agglomeration effect and the economic and spatial development of the areas around this development. Through the advantages of economic development and spatial agglomeration, more people will find employment, gain income and obtain a position where they can break out of the poverty trap and start enjoying the fruit of their labour.

The study done on the structure and development level of South Africa's industrial competitive platform will be discussed in the following section.

6.3 THE INDUSTRIAL COMPETITIVE PLATFORM OF SOUTH AFRICA

Chapter 4 investigated the policies and strategies of the authorities, which influence, and direct the development of South Africa's industrial competitive platform. The study commenced with a historical overview of industrial policy in South Africa between 1910 and 2002, as well as the historic development of regional industrial development policy in South Africa up to the acceptance of the SDI strategy and GEAR, which provided the necessary contextual setting. The macroeconomic environment of industrial development, GEAR, spatial development, SDIs, IDZs and LED were studied. Then, the most important section of the chapter followed, studying the government's industrial policy, trade policy, technology policy, strategic and informational leadership, and labour policy.

South Africa's *Integrated Industrial Strategy* took recognition of the impact that globalisation and the new economy have on the development of less developed regions and is not only intended to repair weaknesses but also build an economy that can reap the benefits that participation in the new economy can offer. The strategy focuses on the pillars that intend to create a regulatory framework, set the rules of conduct and address market failures. The strategy recognises that the country needs to have a modern and efficient technological platform and the skills and expertise to handle modern technology. To accomplish this, human capital has to be developed with a focus on technological learning and employment. The *Integrated Manufacturing Strategy* emphasises the microeconomic focus on firms that is necessary to ensure industrial development and enjoys special attention from the authorities. Investment has to increase, especially in modern technology, while capacity and capabilities are enlarged. The strategy considers increased competitiveness and productivity as the keys to sustained industrial development. Emphasis is placed on the empowerment of SMMEs, the development of markets, and competition and international trade liberalisation with the accent on export promotion.

The authorities realise that in the complex economic environment of today, independent policies will be inefficient and that policies and the effort involved in the creation of an efficient competitive platform has to involve the participation of all role players. It is therefore important that the industrial development policies and strategies form an integrated approach which involves all the various disciplines, state departments, and interlink with the other policies. It is, however, necessary for the South African authorities to provide adequate direction and therefore the country has policies in place regarding their strategic and informational leadership. Other policies that support industrial development like trade, technology and labour policies, were also studied. The assumption of this thesis is that development of the country's competitive platform will promote industrial development. Competitiveness is, however, not concerned with production but with the sales of that produce. This implies that the country's industrial development policies should be integrated with the technological policy while emphasis has to be placed on the country's trade policy as well. The intention of industrial development is ultimately to increase employment and wealth. Labour policies therefore have to ensure that the quality of human resources improves, making people employable, but should also ensure that people would also be able to improve their living conditions and they are not locked into jobs that would let them remain part of the working poor. All this implies that with industrial development a large array of other supporting policies have to be integrated and linked.

Chapter 5 studied the competitiveness of South African industries by first studying the ways competitiveness are calculated and determined and considered various surveys and databases that were compiled in the recent past. The methodology IMD, WEF and AT Kearney employed to calculate the various indices, was investigated. Emphasis was given to the World Competitiveness Index, the Global Competitiveness Index and the Globalisation Index. The problems that exist when these indices are determined and criticism that are expressed, were then discussed.

The following section considered the competitiveness of South Africa by studying the provincial cluster potential that was identified in the various provinces, linkages and competitiveness identified, and the local comparative advantages of the various regions and municipalities that can be derived from PIMMS database. This gave a picture of the country's competitiveness on a national, provincial, regional, industrial and local level. The same methodology was followed in the next section.

In the following section consideration was given to competitiveness, and it focused particularly on the obstacles to competitiveness on a national, provincial and local level by considering various surveys. The National Enterprise Survey was first considered, followed by the World Bank Survey on the Greater Johannesburg Metropolitan Area.

Studying the various surveys and databases in this chapter was disappointing in the sense that it did not clearly reveal South African industries' proficiency to cope and prosper in the new economy. Globalisation and modern technology have a decisive influence on industrial development. The surveys studied in this chapter only showed South Africa's capability to function in the *"new economy"* to a limited extent. It was shown in the previous chapters that the *"new economy"* is characterised by high levels of market and trade liberalisation, modern technology (especially electronic and information technology) and increasing returns. Production processes are shorter and more specialised and easily adaptable. Mass production (*Fordism*) is being gradually substituted by flexible production, and the *"New Economic geography"* indicates that maximum profits are no longer limited to processes within the firm. The *"New Economic Geography"* shows that competitive industrial districts and industrial clusters, with a variety of supporting services, networks, pools of skilled workers, available intermediate inputs, knowledge and technological spill-overs are becoming increasingly important in the production process, and in the achievement of increasing returns to scale and higher profits. All these aspects of the so-called *"New Economy"* have an influence on the international competitiveness of industries and regions and their ability to create employment, alleviate poverty and to increase everyone's welfare. Government policies can have an excruciating influence on industrial development and modern policies should enhance the competitively of industries in the *"new economy"* and ensure that people receive the necessary skills and that the country obtain the capabilities and technology that it needs. In the surveys and data studied in this chapter, very little information relevant to the aspects discussed in these paragraphs was found. The level and extent of skills and technology, and what is being done to enhance it, was not adequately shown in these surveys. It is specifically these aspects that the next chapter attempted to investigate. The following section discusses the findings of a survey that was conducted on the South African competitive platform during 2002.

6.4 THE SURVEY OF THE INDUSTRIAL COMPETITIVENESS PLATFORM: THE EMPIRICAL FINDINGS

Chapter 5 reported on a survey conducted during 2002 on the competitiveness platform of South African manufacturing firms. The study commenced by first reporting on the results of the responding firms that were received as a population. This was followed by studying the competitiveness of firms differentiated according to firms-size differences, according to the ten major manufacturing sub-sectors, and according to the nine provinces.

Although manufacturing firms do not rate as very highly competitive, the results were much better than would have been expected, especially with regard to their managerial proficiency, product quality

and technological resources and expertise. This survey highlighted the reliability and quality of communication services, electrical supply, water and other utilities, which are rated very high by all respondents. The study revealed much detail, like the need for cold storage facilities that presents a problem to nearly all manufacturers, most firms experience a shortage of artisans, and there exists a need for more training facilities, especially for vocational and industry related training. Respondents rated harbour and ocean freight facilities as failing. It was also seen that although distance from the sea presents a competitive disadvantage to landlocked provinces, firms near a long coastline do not gain competitive advantages from it. KwaZulu is the only province that enjoys some benefit from its harbours. The same applies to the provinces with large airports.

Poor perception of the government and the civil service was the strongest factor depressing competitiveness according to the respondents of this survey. Manufacturers see civil servants as inefficient, the civil service as non co-operative, and the government as incompetent. Unsatisfactory business conditions are mainly ascribed to government action, policies and interventions. Irresponsible political conduct by the government and policy instability causes investment risk to deteriorate, business confidence and foreign investment to decline, which leads to sustainable deterioration of and business conditions, pushing up costs and prices while the local currency continually depreciate. In order to improve the competitive position of industries in South Africa this problem should be addressed. Government should make a sincere attempt to improve its efficiency and competence, improve communication and show commitment. A large propaganda campaign is further needed to improve perceptions and show that the country has a most modern and sophisticated government sector, which is efficient and benefits everyone. Much have to be done to improve the image of the government and civil service.

Very few respondents were aware of SDI developments in their vicinity, highlighting that the government's communication network in the country is inefficient. If people are better informed of what the government are doing, a lot of the wrong perceptions will disappear. Expectations and business confidence will then also be promoted. Many companies wish for government's assistance to increase. Currently it is felt that aid from government fails them and that the government does not care, especially with regard to factors that can move their marginal cost curves to the right. Private citizens got major tax relief in the beginning of 2002, while the plight of companies was only aggravated by all kinds of levies and regulations, like the Skills Levy Act and several others. Firms feel that the government should provide all kinds of subsidies, aid, incentives, loans and other support, including managerial skills and investment support, if the government is sincere in its effort to stimulate industrial development, economic growth and job creation. Currently, respondents indicate that such assistance is lacking. With the GATT agreements and stipulations of the WTO this is a major

problem, but manufacturers feel that government has to do something to level the playing field. Industrial standards, workplace regulations and laws, and environment protection legislation and guidelines are seen as very costly and mostly lacking and unclear. It is important that guidelines, regulations and legislation are clear and explained to all involved.

On the firm level it was found that firms are proficiently producing new innovations within the firms, but neglect the further development and registration of such new patents. This is a large problem with most manufacturers. If more could be done to assist companies in this regard, it would improve the competitive platform of the whole country. New innovations can produce technology that is better suited to the local situation than imported technology and improve profit growth and employment.

It was found that competitiveness increases with firm size. Large firms are significantly more competitive compared to small firms. The competitiveness indices of large firms are higher than small firms for all sub-categories. Large firms produce better quality and are superior with regard to strategy, structure, management and the utilisation of related and supporting industries and institutions. Larger firms can achieve scale economies; they are more efficient and therefore more competitive. According to their competitive indices, large firms are the most competitive with regard to internationalisation, management, science and technology. Medium firms are, however, the top performers in the categories of local economy, government, finance, infrastructure and people. The productivity index that was calculated also revealed that productivity correlated with firm size.

The most competitive provinces are the North West, KwaZulu and Mpumalanga. Although Gauteng is the largest contributor to South Africa's GDP it is not the most competitive. Each province has its own set of problems, but those stated above occur in all. It is logical that rising costs would also present problems to all. Rising input costs, taxes and high interest rates are of concern to all firms and none expect the situation to improve in future. When the competitiveness of ten major manufacturing sub-sectors was studied it was found that the competitiveness of the different sub-sectors is about equal. No industry was significantly more competitive than others and no sub-sector much weaker than others. Food processing and transport equipment manufacturers seem most competitive, but the others not much worse. An alarming aspect was the low level of technological proficiency, expertise and innovation in the science- and technology-based industries like chemicals and electronics. If South Africa is to survive in the new economy its level of technological expertise, capabilities and capacity will have to be improved considerably.

No factors regarding the competitive platform were on average rated as good or excellent. High and rising labour costs were a point of concern, together with workplace regulations, unproductively, and

low work ethics of the workforce with regard to motivation, neglect and conscientiousness. More investment in human capital is very important in order to improve productivity and competitiveness.

Local demand conditions are unsatisfactory but it is assumed that this problem can only be addressed in the long-run following industrial development and job creation, but also economic development of the people in all facets of their lives including income equity, education, and better health to name a few.

Although infrastructure, roads, and railway networks are well developed, firms often find it difficult because links and railheads are too far. Proximity and availability of airports and airport facilities are also a problem, it presents serious problems, especially in some provinces and particular industries. Supporting services are still absent in many areas and where they do exist it is not sufficiently utilized. Most manufacturers do specialize in the production of a particular part or phase of the final product, but evidence of modern flexible production is still absent. The level of expertise in and access to modern production technology and innovations found within firms were much higher than expected from a less developed country, especially those manufacturing transport equipment, but still the county's technology platform is on average only rated as fair and disappointingly low in those science and technology-based industries that need it the most, like electronics and chemicals.

Firms do not experience serious shortages of any kind except with raw and intermediate materials and some levels of skilled labour that sometimes causes slight problems. Of the trilogy of the new economic geography all aspects still fail competitiveness. In most places the pool of skilled labour is inadequate, intermediate inputs are sometimes difficult to find, non-tradable factors do not enhance competitiveness adequately, and technological and knowledge spill-overs from other firms are poorly utilised. On the Porter diamond input factors do not present serious obstacles, except those mentioned above, demand conditions are poor, firm strategy, structure, rivalry and management are rated between fair and good, while support services and institutions are inadequately provided and not sufficiently utilised.

The study computed competitive indices for the nine provinces of South Africa, the ten sub-sectors of manufacturing, and according to firm size. The most important value of these indices was that it confirmed the information obtained from the analysis of the questionnaire, and the sub-sectors provided additional insight and information about aspects like economic performance, internationalisation, productivity, government and institutions, business efficiency and management. It was confirmed that competitivity rises with firm size. The most competitive provinces are KwaZulu Natal, North West and Mpumalanga, while food processing, transport, textiles and furniture are ranked

as the most competitive industries with the highest competitiveness indices. Provinces or sub-sectors that rank high in the total competitiveness index usually also perform well in the sub-categories, while those with weak indices also perform below average in most sub-categories as well.

The subjective nature of this survey can be criticised. When managers are, for instance, asked to evaluate their skills and performance, most will rate themselves very high and all will usually complain about their lazy workers and severe taxes. The ease with which the questionnaire could be completed and the good response did, however, provide a very large amount of useful information that would not have been possible to gather otherwise. The exceptionally high Cronbach alpha values do suggest that the response from firms is significant. Subjective evaluation of industry and business conditions is also important, as investment decision is made based on expectations and perceptions. When considering the theory of production in chapter 2, it was shown that the most important aspect in enhancing industrial competitiveness was in addressing the cost structures of firms. This survey found that high costs, taxes and interest rates do hamper industrial activity slightly. Although it falls outside the scope of this thesis, an important extension to this study will be the calculation of cost competitiveness. A problem when determining cost competitiveness is the availability of detailed data and the estimation of shadow prices.

To conclude, the elements of the competitiveness platform in South Africa that presents obstacles and impede industrial development which were highlighted in this survey can be summarised as:

- Poor human capital
    - Especially low productivity, motivation and work ethics
    - Insufficient vocational and industry related training facilities
    - A shortage of artisans
- Inefficient support services, like a shortage of cold storage and harbour facilities for example
- Poor perception of the government
    - Inefficient and non co-operative civil service
    - A lack of government assistance, information, aid and incentives
    - Political and policy instability
- A poor technological platform in some industries like electronics
- High costs, taxes and interest rates
- Shortages of raw materials; and
- Poor market demand.

6.5 RECOMMENDATIONS

The development of an industrial competitive platform for South Africa that will ensure sustained growth and development will require active and dynamic strategies and leadership from the government in co-operation with the private sector. South Africa needs an industrial platform which is technologically advanced and supported by an appropriate labour force that could support industrial development and eventual growth in competitiveness, productivity, income and living standards. The collective nature of the industrial competitive platform prevents the private sector mostly from taking the initiative in the development of the industrial sector. Strong leadership from government is therefore essential. The publication of the new Integrated Industrial Strategy of the government that aims to develop an industrial sector that would be globally competitive in the new economy is a step in the right direction. The strategy is, however, vague and idealistic and requires much more detail to succeed. The authorities have to initiate a programme of action, while the private sector also does their share in developing the competitive platform.

In the first place, government should initiate a productive drive that will improve the efficiency of its civil servants and transform the civil service into a professional body that is user-friendly, putting their primary clients first. Unnecessary bureaucratic hindrances should be eliminated and co-operation with the public and firms should be promoted, while an image of friendliness and commitment are portrayed. Transactions with the government should be conducted with speed and correctness.

At the same time government officials should refrain from political actions that can endanger the business climate and investment flows. The country should be portrayed as a risk free environment where peace and stable policies ensure positive investment gains. The authorities should seek out ways to enhance production and help manufacturers where possible.

Direct subsidies and tariffs are becoming less of an option but the competitive platform can be enhanced in an active campaign. Actions that would address cost structures, enhance the factors of production, and develop the technological platform should receive priority. Technical training facilities should, for instance, be built and promoted and where the private sector provides training subsidies on training could be given. The Skills Development Act is a step in the right direction. The acquisition of raw material and intermediate inputs can be assisted, while infrastructure is supplied where it could be to the advantage of manufacturers. The government can also help firms in the acquisation of information and assist in finding export markets and learn the procedure. Unfortunately, where such schemes and aid are available, no one ever knows about it. The ignorance concerning the development of SDIs in South Africa is one example that shows that government's communication with the public

and industries is insufficient. Sometime funds are available for job creation or export promotion, but no applications are made because people do not know about it or do not know how to go about obtaining such funds. Government will have to improve its communication and ability to distribute information.

The government has to its disposal departments with highly skilled research units, like the Department of Trade and industry, and can utilise the expertise of organisations like the Productivity Institute, IDC and the CSIR to conduct research and develop a technological base, well-organised efficient civil service and an efficient competitive platform. The country also has universities and engineers that can develop such a base further. What is needed however, are commitment, direction and leadership.

The first step in improving the industrial competitive platform in South Africa is for government to start a propaganda campaign to improve the negative perspective people have of the government and spread information. Government must set perspectives right. Were government and the civil service are inefficient, it should be rectified and positive image building should be conducted. This can also include motivation towards a higher motivated, productive and professional civil service, but should also be directed to the private sector and its workforce.

Higher skills are needed and training should be given. Compulsory school education for children is a step in the right direction but more should be done in the direction of technical training. Firms are experiencing a shortage of artisans and this problem should be addressed immediately. A shortage of artisans might be an indication of neglect in technical training in favour of managerial and professional staff. This might be an indication of shortages in the supply of technicians and engineers in future. As artisans, technicians and engineers are the people that are practically involved in the handling of modern technology on a daily basis, technological proficiency and innovations will mostly be coming from these people.

Technical personel are the people that daily adopt technology and equipment to suit their needs, leading to new innovations and new technology that can yield high profits. Usually these innovations are not known to management, and when they do take note of it is not further developed and patented, and if it does the intellectual property rights and the profits spreading from it are taken by the company. Workers at shop floor level should be encouraged to make plans and find new innovative ways of doing things better and awarded for new ideas and innovations. More training will also support innovation. A body should be established that could assist people and firms in developing new plans and innovations further and put it into practice.

Where support services are inefficient the authorities can also assist in this regard. The private sector can be taken in partnership here and if good profits can be reaped by the private sector its participation will be ensured. Services that are not sufficiently supplied, like cold storage facilities and ocean fright services can also be initiated by government and organised in collaboration with private initiative. The utilisations and dissemination of technological and knowledge spill-overs can also be assisted by government involvement. Sometimes these spill-overs are not shared among firms due to competition and fear that opponents will gain competitiveness. Government involvement can assist in this regard.

The authorities can do research in certain industries where a strong technological platform is essential but lacking, like in the electronics industries. This could assist in the creation of capabilities, capacity and expertise necessary to lead South African industries successfully into the competitive modern global new economy. The import of capital goods is very expensive and frequently modern technological equipment will be too expensive to acquire. Here the authorities can assist and if profitable, even consider manufacturing such equipment locally.

In addressing cost structures the supply-side initiative initiated by GEAR should continue. When large firms prosper they could also be led to undertake some of the building of the technological base themselves. Tax alleviation to private people were given while various levies and fees were added during the past decade, and other taxes like capital gain taxes were introduced to increase the tax burden of firms. It could assist industrial development if tax relieve could also be given to industries.

It was found that there are specific differences in the competitive platforms of the various provinces and this implies that the different provincial governments should focus on different priorities. The competitive indices highlight possible development agenda for selective interventions in the various provinces. Finance, management, and infrastructure deserve special attention in Gauteng; Mpumalanga should regard development of its people, internationalisation and infrastructure as a priority; while North West has to focus on its local economy, internationalisation, and its people. While most aspects in Limpopo deserve attention, the most pressing are its human capital, local economy, business efficiency, and infrastructure. KwaZulu/Natal has high competitive indices on most sub-categories, but management, infrastructure and people, deserves much attention. The Free State has low indices for its local economy, people, infrastructure and internationalisation, while the Eastern Cape has to focus on the efficiency of its government, management, science and technology, especially to support the motor vehicle cluster and Coega IDZ in the province. In the Northern Cape the local economy, government, infrastructure, management, and science and technology need attention and in the Western Cape local economy, business efficiency, internationalisation, infrastructure and human capital. Limpopo, Western Cape and the Northern Cape have the lowest productivity indices and

much attention should be given to the development of human capital and science and technology in an effort to improve efficiency and productivity.

Spatial Development Initiatives (SDIs) and Industrial Development Zones (IDZs) initially received much attention, but since it became the responsibility of local governments some of the emphasis was lost. Provincial governments need to distribute more information on these initiatives and improve the marketing thereof. It was shown that most industrialists have no knowledge about these initiatives and the advantages and incentives they offer, even when they are situated within such a development zone or initiative. Provinces can also provide more information through investor conferences and initiate more pilot projects to illustrate the competitiveness of these areas.

The market demand will only improve if the economy in South Africa is growing and investments flow into the country due to profitable expectations. When the economy improves due to its high competitive position, investment will increase, leading to more employment, and more people receiving income ensuring high market demand that will ensure sustainable economic and employment growth.

When these recommendations are followed it might address much of the shortcomings and obstacles that were identified through the empirical analysis of the survey on the industrial competitiveness platform. The development and continuous enhancement of a modern industrial competitive platform are essential in developing a prosperous industrial sector, a growing economy, and increasing wealth for all the citizens of South Africa.

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APPENDIX

TRADE AND INDUSTRIAL SURVEY: INDUSTRIAL COMPETITIVENESS PLATFORM
POTCHEFSTROOM UNIVERSITY
2002

(For office use only)

Part 1: Classification of organisation:

(Mark the appropriate block)

1.1 Annual Turnover: (R mil.)

1	2	3	4
<1	1-5	6-10	>10

1.2 Type of Product

1. Food Process		2. Textiles		3. Paper/wood	
4. Chem & Plastic		5. No-Metal Mineral		6. Metal prod	
7. Elect Machines		8. Electronics		9. Transport	
10. Furniture		11. Other			

1.3 Location

1. Mpumalanga		2. Gauteng		3. North West Prov	
4. Limpopo Prov.		5. Free State		6. Kwa/Natal	
7. Western Cape		8. Eastern Cape		9. Northern Cape	

1.4 Foreign Trade as % of Turnover

1	2	3	4	5
<5%	5-25%	26-50%	51-75%	76-100%

1.5 Number of Employees

1.6 Annual Overhead Costs (Rand)

1.7 Age of the Firm (years)

1.8 Do you have an internet Address (e-mail)?

Yes	No

Internet Address (optional) _____

Part 2: Spatial Development Initiatives / Development Corridors

2.1 Is your firm (or subsidiaries) located within a Spatial Development Initiative (SDI) / Development corridor?

Yes	No

2.2 If "yes" in (2.1) which SDI?

2.2.1 Maputu Development Corridor (MDC along the N4)		2.2.6 Richards Bay SDI	
2.2.2 Platinum SDI (in North West)		2.2.7 Phalaborwa SDI	
2.2.3 Fish River SDI		2.2.8 Coega SDI/IDZ	
2.2.3 Wild Coast SDI		2.2.9 Mabopane/Centurion	
2.2.4 West Coast SDI (WCII) (Western Cape)		2.2.10 Potch – KOSH N12 (Treasury route)	
2.2.5 Lubombo SDI		2.2.11 Western Frontier	

2.2.12 Other: (Specify): _____

2.3 Did the introduction of the SDI / Development Corridor enhanced manufacturing in your firm in any way?

Yes	No

2.4 Did the introduction of a SDI or Development Corridor led to Increasing Returns and/ or Economies of scale for your company

Yes	No	n/a

14. In what alternative ways can the authorities enhance local manufacturing?

_____
_____
_____
_____
_____
_____
_____

15. Any comments or suggestions: _____
_____
_____
_____
_____
_____
_____

Part 3: Competitive Strengths and Investment Opportunities

Rate the factors below according to their impact on your competitiveness	*1* **Very poor**	*2* **Poor**	*3* **Fair**	*4* **Good**	*5* **Very good**
3.1 Human Resources					
3.1.1 Availability of unskilled labour					
3.1.2 Availability of artisans					
3.1.3 Availability of technically skilled labour					
3.1.4 Availability of managerial staff					
3.1.5 Wage rates					
3.1.6 Unit labour cost / output per worker					
3.1.7 Vocational / industry related training facility					
3.1.8 Work ethic of labour force					
3.1.9 Productivity of labour force					
3.1.10 Workplace regulations					
3.1.11 Efficiency of civil servants					
3.2 Resources					
3.2.1 Availability of suitable land					
3.2.2 Research facilities, resources and support services					
3.2.3 Scientific infrastructure					
3.2.4 Trade and business association support					
3.2.5 Market and product information					

Rate the factors below according to their impact on your competitiveness	1 Very poor	2 Poor	3 Fair	4 Good	5 Very good
3.2.6 Import of inputs					
3.2.7 Availability of capital					
3.2.8 Cost of Capital					
3.2.9 Project development and financial support					
3.2.10 Application of modern technology					
3.2.11 Access to Finance					
3.2.12 Level of development of the financial and banking sector					
3.2.13 Telecommunication Services					
3.2.14 Electricity Cost & Reliability					
3.2.15 Road and rail network					
3.2.16 Air transport network					
3.2.17 Sea transport network					
3.2.18 Traffic at border posts and harbours					
3.2.19 Social Infrastructure (medical facilities, schools, etc.)					
3.3 Demand Conditions					
3.3.1 Size of the domestic market					
3.3.2 Export opportunities (Africa and Middle East)					
3.3.3 Export opportunities (Other)					
3.3.4 Structure of domestic demand (consumer sophistication etc.)					
3.3.5 Levels of market differentiation and saturation					
3.3.6 Market or sales prices					
3.3.7 Government demand					
3.3.8 Population growth					
3.3.9 HIV Aids					
3.4 Related & Supporting Industries and Institutions					
3.4.1 Dependence on imports (consumer, intermediate and capital goods)					
3.4.2 Domestic suppliers					
3.4.3 Linkages to technology, access to information, exchange of research and joint problem solving					
3.4.4 Value chain co-operation (share critical activities)					
3.4.5 Sub-contracting other manufacturers					
3.4.6 Utilise support services					
3.4.7 Membership of business associations					
3.4.8 Contact with organisations and firms in other countries					
3.4.8 Government competence					
3.4.10 Government policies					
3.4.11 Government interventions					
3.4.12 Quality of legal institutions					
3.4.13 Co-operation with competitors					

Rate the factors below according to their impact on your competitiveness	1 Very poor	2 Poor	3 Fair	4 Good	5 Very good
3.5 Firm Strategy, Structure & Rivalry					
3.5.1 Co-operation with Suppliers					
3.5.2 Co-operation with clients					
3.5.3 Co-operation with competitors					
3.5.4 Co-operation with government					
3.5.5 Employee performance incentives					
3.5.6 Growth in exports					
3.5.7 Ability to enter foreign markets					
3.5.8 Growth in profits					
3.5.9 Business contacts					
3.5.10 Managerial practices					
3.5.11 Managerial skills in integration and innovation of business activities					
3.6 Technology and Innovation					
3.6.1 Upgrading of your input / production mix					
3.6.2 Use of computers in the production process					
3.6.3 Use of the internet					
3.6.4 Use of cell phones and similar modern communication technology					
3.6.5 Investment in new production technology					
3.6.6 New innovations within the firm					
3.6.7 New patents (registered and unregistered)					
3.6.8 New innovative application of existing technology					
3.6.9 Innovative application of new technology					
3.6.10 Research within the firm creating innovations and new technology					
3.6.11 Utilisation of technological and knowledge spill-overs from other firms					
3.7 Quality & Environment					
3.7.1 Quality of material inputs					
3.7.2 Quality of final product for domestic consumption					
3.7.3 Quality of final product for export					
3.7.4 Cost of compliance to standards					
3.7.5 Pollutants in the production environment					
3.7.6 Cost of compliance to environmental legislation					
3.7.7 Lack of / unclear environmental protection legislation / guidelines					

Part 4: Expansion

(4.1) What are the possibilities for your manufacturing expansion and indicate the location of such planned expansion (tick the appropriate box).

1	*2*	*3*	*4*	*5*
Expanding this year	Expanding in 1 - 3 years	Expanding in 4 - 5 years	Unsure of expansion opportunities	No expansion Opportunities

Location

1	*2*	*3*
Current Site	New Site in same area	Other area:

Part 5: Beneficiation of Product Output

5.1 What type of manufacturing activities could be established in the vicinity of your existing plant in terms of the further processing (beneficiation) of your products by yourself or any other manufacturing concern.

_____

_____

_____

_____

_____

_____

_____

5.2 Mark the appropriate:	Yes	No
Do you only specialise in the production of a part or phase of the final product?		
Or do you manufacture the whole product completely?		

5.3 What is the average level of education among the firm's labourers?	
- and the average level of education among the skilled personnel?	

5.4 What are the main reasons why employees are absent from work? (e.g. TB, AIDS, malaria, transport, laziness, unmotivated, tradition, trade actions ...)

_____

Part 6: Backward linkages with existing establishments

6.1 What type of manufacturing activities could be established in the vicinity of your existing plant in terms of other concerns supplying you with raw and semi-processed materials, packaging materials, service industries, etc.

_____

_____

_____

_____

_____

Part 7: Other manufacturing opportunities

7.1 Besides the above (i.e. Expansion and forward and backward linkages) what other types of industry, in your opinion, would do well in your industrial area/province (e.g. Wood and wood products, tobacco products, textiles, etc).

_____

_____

_____

_____

_____

Part 8: Rate the following locational aspects of your premises

5 Very Good 4 Good 3 Poor 2 Very Poor 1 Fail 0 Not Applicable

- Draw an X in the appropriate square

8.1 Availability of harbour facilities	0	1	2	3	4	5
8.2 Proximity to Professional Services	0	1	2	3	4	5
8.3 Proximity to main road links	0	1	2	3	4	5
8.4 Reliability of water supply	0	1	2	3	4	5
8.5 Availability of courier services	0	1	2	3	4	5
8.6 Availability of ocean freight services	0	1	2	3	4	5
8.7 Availability of corporate financial services	0	1	2	3	4	5
8.8 Availability of container services	0	1	2	3	4	5
8.9 Availability of trucking services	0	1	2	3	4	5
8.10 Personal contact with customers	0	1	2	3	4	5
8.11 Proximity to national airport	0	1	2	3	4	5
8.12 International airport facilities	0	1	2	3	4	5
8.13 Reliability of electricity supply	0	1	2	3	4	5
8.14 Proximity to railheads	0	1	2	3	4	5
8.15 Rates and taxes	0	1	2	3	4	5
8.16 Availability of cold storage facilities	0	1	2	3	4	5
8.17 Availability of health services	0	1	2	3	4	5
8.18 Proximity to market	0	1	2	3	4	5
8.19 Proximity to support services	0	1	2	3	4	5
8.20 Reliability of telecommunication services	0	1	2	3	4	5
8.21 Local environmental considerations	0	1	2	3	4	5
8.22 Availability of quality shopping services	0	1	2	3	4	5
8.23 Availability of schools, colleges, etc.	0	1	2	3	4	5
8.24 Availability of entertainment / recreation facilities	0	1	2	3	4	5
8.25 Availability of after-sales services	0	1	2	3	4	5
8.26 Availability of subcontractors	0	1	2	3	4	5
8.27 Availability of semi- and unskilled labour	0	1	2	3	4	5
8.28 Availability of housing for employees	0	1	2	3	4	5
8.29 Proximity to suppliers of spare parts	0	1	2	3	4	5
8.30 Availability of industrial land	0	1	2	3	4	5

Part 8 (cont.): Rate the following locational aspects of your premises

5 Very Good 4 Good 3 Poor 2 Very Poor 1 Fail 0 Not Applicable

8.31 Cost of industrial land	0	1	2	3	4	5
8.32 Proximity to semi-processed materials	0	1	2	3	4	5
8.33 Availability of skilled labour	0	1	2	3	4	5
8.34 Proximity to raw materials	0	1	2	3	4	5
8.35 Availability of intermediate inputs	0	1	2	3	4	5
8.36 Quality of water and other utilities	0	1	2	3	4	5
8.37 Cost of water	0	1	2	3	4	5
8.38 Cost of telecommunication services	0	1	2	3	4	5
8.39 Cost of electricity	0	1	2	3	4	5
8.40 Availability of housing for key personnel	0	1	2	3	4	5
8.41 Availability of industrial training facilities	0	1	2	3	4	5
8.42 Labour costs	0	1	2	3	4	5
8.43 Transport costs in	0	1	2	3	4	5
8.44 Transport costs out	0	1	2	3	4	5
8.45 Environmental protection legislation	0	1	2	3	4	5
8.46 Availability of other manufacturing firms in the industrial district	0	1	2	3	4	5
8.47 Probable investment risk	0	1	2	3	4	5
8.48 Business support services	0	1	2	3	4	5
8.49 Other government incentives	0	1	2	3	4	5
8.50 Aid from government	0	1	2	3	4	5
8.51 Investment from abroad	0	1	2	3	4	5
8.52 Import tariffs and other international trade restriction	0	1	2	3	4	5
8.53 Political and policy stability	0	1	2	3	4	5

Part 9:

Compared to the same quarter a year ago are:

	Estimated activity in current quarter			Expected activity in next quarter		
	Down *(1)*	Same *(2)*	Up *(3)*	Down *(1)*	Same *(2)*	Up *(3)*
9.1.1 Domestic Sales (Volume)						
9.1.2 Export Sales (Volume)						
9.2 Production (Volume)						
9.3.1 Domestic orders received (Volume)						
9.3.2 Export orders received (Volume)						
9.4 Unfilled order relative to total assets						
9.5 General business conditions						
9.6 Number of factory workers						
9.7 Average hours worked per factory worker						
9.8 Fixed investment						

Part 9 (cont.):

Compared to the same quarter a year ago are:

	Estimated activity in current quarter			Expected activity in next quarter		
	Down (1)	Same (2)	Up (3)	Down (1)	Same (2)	Up (3)
The rate of increase in the :						
9.9.1 Average total cost per unit of production						
9.9.2 Average labour cost per unit of production						
9.9.3 Average purchase price per unit of raw material						
9.9.4 Average domestic sale price per unit of production						
9.9.5 Average export sale price per unit of production						
9.9.6 Taxes paid as % of sales						

Compared to the same quarter of a year ago are current stock of ...	Too low (1)	Sufficient (2)	Too high (3)	Too low (1)	Sufficient (2)	Too high (3)
9.10.1 Raw materials relative to planned production						
9.10.2 Finished goods relative to expected total demand						

	Shorter (1)	Same (2)	Longer (3)	Shorter (1)	Same (2)	Longer (3)
9.11 Delivery period of orders						

	Yes	No	Yes	No
9.12 Is your current level of output below capacity				

	Satisfactory	Unsatisfactory	Satisfactory	Unsatisfactory
9.13 How do you rate business conditions				

Part 10: To what extent do the following hamper your activities:	Not at all (1)	Slightly (2)	Seriously (3)	Compared to the previous quarter have these factors: Deterio-rated (1)	Remained the same (2)	Improved (3)
10.1 Shortages of						
10.1.1 Skilled labour						
10.1.2 Semi-skilled labour						
10.1.3 Unskilled labour						
10.1.4 Managerial staff						
10.1.5 Raw materials						
10.1.6 Water						
10.1.7 Electricity						
10.1.8 Other Utilities						
10.1.9 Machinery and Equipment						
10.1.10 Maintenance and support services						
10.1.11 Packaging and marketing material						
10.1.12 Technology & knowledge support services						
10.1.13 Competition from other firms						

To what extent do the following hamper your activities:		**Not at all** *(1)*	**Slightly** *(2)*	**Seriously** *(3)*	**Compared to the previous quarter have these factors**		
					Deterio-rated *(1)*	**Remained the same** *(2)*	**Improved** *(3)*
10.2	The level of short-term interest rates						
10.3	Insufficient demand for your products						
10.4	Interface with TRA & interpretation of tax law						
10.5	Municipal levies, taxes and permit costs						
10.6	Lead time for Expatriate work permits						
10.7	Import dumping on domestic market						
10.8	Bribery and corruption						
10.9	Availability of medium term finance						
10.10	Non co-operative civil service						
10.11	Import & export restrictions and barriers						

Compared to the current activity, what do you expect the following to be in 12 month's time.		Lower *(1)*	Same *(2)*	Higher *(3)*
10.12	Volume of goods imported			
10.13	Volume of goods exported			
10.14	Investment in Machinery and Equipment			
10.15	Investment in land and buildings			
10.16	General business conditions			
10.17	What are the prospects over the next 12 months of investment in new capacity			

What factors are likely to limit your ability to invest over the next 12 months?		Not at all *(1)*	Slightly *(2)*	Seriously *(3)*
10.18	Insufficient demand for products			
10.19	Cost of credit			
10.20	Lack of credit			
10.21	Tax structure			
10.22	Access to electricity and water			
10.23	Access to raw materials			
10.24	Lack of managerial skills and investment support			

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