

INDUSTRIAL STRATEGY AND SOUTH AFRICA'S INTERNATIONAL TRADE POSITION: THE INFLUENCE OF STRUCTURAL CHANGE AND INDUSTRIAL LOCATION

C. M. Naude and C. Harmse

Department of Economics

University of Pretoria

ABSTRACT

The success of the South African government's Global Economic Strategy (GES) depends to a significant extent upon the ability of the economy to export in key sectors (e.g. manufacturing), thereby enhancing the country's international trade position and its competitiveness in the global market. However, the formulation of an Industrial Strategy which facilitates structural change in the South African economy is a prerequisite foundation for that success. The location of industry to maximize the contribution of industry to export competitiveness is also a fundamental component of success for this initiative.

With these linkages in mind, it is significant that the GES contains references to the need for coherence between industrial strategy and international trade, through a number of industry cluster studies for key industries. It also points to a Regional Industrial Location Study (RILS) designed to link industrial and trade policies between regions inside and outside South Africa. Finally, GES includes a programme of attracting industries into Export Processing Zones (EPZs) and Industrial Development Zones (IDZs) where firms will be able to gain various advantages in terms of reduced tariffs on inputs and export incentives.

The aim of this paper is to examine the relationship between industrial strategy and international trade. Therefore, the paper examines the linkages between trade theory and location theory and then proceeds to a review of relevant economic theory. The theoretical review covers Marshall's agglomeration theory, Weber's location theory and the Heckscher-Ohlin theory of international trade. Key government programmes which have a spatial component are examined in terms of their capacity for improving exports and ultimately output and employment. These programmes include the Spatial Development Initiatives (SDIs), Export Processing Zones/Industrial Development Zones (IDZs) and the Regional Industrial Location Study (RILS). Finally, conclusions are drawn regarding the potential of these programmes to enhance export-led growth in the country. It is concluded that the economic sectors identified in these programmes have not demonstrated an ability to generate exports and, in turn, output and employment.

INTRODUCTION

The government's Global Economic Strategy (GES), put forward by the Department of Trade and Industry (DTI) (see Department of Trade & Industry, 2001), has identified a number of initiatives as part of their trade strategy which have a spatial or geographic element. These components are the Spatial Development Initiatives (SDIs), Export Processing Zones (EPZs)/Industrial Development Zones (IDZs)¹ and the Regional Industrial Location Strategy (RILS). This paper evaluates each of these elements of the GES trade strategy in the context of the possible linkages between trade theory and location theory.

The research hypothesis examined in this paper is that the key components of the government's GES, namely the aforementioned SDIs, EPZs/IDZs and RILS, ought to lead to increased manufacturing exports in certain locations. Put another way, the question is whether the location of industry in South Africa could be an impediment to the country's plans concerning international trade and competitiveness.

LINKAGES BETWEEN TRADE THEORY AND LOCATION THEORY

A key component of the paper explores the linkages between industry location and agglomeration effects, as first proposed by Weber (1929) and Marshall (1920) respectively, and the Heckscher-Ohlin theory of international trade. The linkages between the theory of international trade and industry location are strong, even according to no less an authority than Bertil Ohlin himself:

"Trade theory verges on location theory. Instead of asking why certain countries exchange certain goods with one another, one can ask why production is divided between these countries in a certain way" (Ohlin, 1967: 307) (see also Ohlin, *et al*, 1977 & Johnson, 1981).

The implication of this is that if the Heckscher-Ohlin relative factor endowment theory of international trade is considered, this is virtually the same as industry location. Krugman (1993) examines location theory and trade theory in terms of their key assumptions to determine the extent of the common ground between them, while taking his lead from Ohlin: "Ohlin's *Interregional and International Trade* was in principle written in order to demonstrate that the two branches of economics are essentially the same. If one steps back from the global economy and views it from a distance, it is hard to see why one should draw any sharp distinction between trade theory and location theory" (Krugman, 1993: 110).

Krugman then proceeds to identify the assumptions of each and then explore the implications of the linkages between each (see Table 1):

Table 1: Key characteristics of International Trade Theory and Location Theory

Trade Theory	Location Theory
General Equilibrium Perfect Competition Constant Returns to Scale Immobile Factors Zero Transportation Costs	Partial Equilibrium Imperfect Competition Increasing Returns Mobile Factors Transportation Costs

(Source: Krugman, P.R. 1993. "On the Relationship between Trade Theory and Location Theory." *Review of International Economics* 1(2): 110-22)

In terms of finding common ground between the two theoretical areas, Krugman addresses each of the areas.

Equilibrium

If trade theory and location theory are to be linked, the approach ought to be in terms of general equilibrium which takes account of all market interactions.

Competition

Trade theory has moved since 1980 to take account of imperfect competition so no conflict looms in this area.

Returns to scale

Increasing returns ought to be part of any trade-location theory approach.

Factors

The location theory view of mobile factors and immobile land should dominate, although barriers to the movement of factors exist, e.g. borders.

Transportation costs

Transport costs ought to be included, as it is apparent that the magnitude of trade between countries is a function to a large extent of the distance involved.

Ohlin sets out a number of key domestic components which influence the location of industry within a country (Ohlin, *et al*, 1977):

- total supply and prices of the mobile factors

- quantities, local spread and prices of natural resources and of other immobile or incompletely mobile factors
- transport conditions - e. g. roads, railways, canals, harbours, surface of the earth
- relative transportability of raw materials, semi-manufactured goods, machines and finished goods
- external economies from certain forms of agglomeration
- internal economies of scale
- local spread of productive units which are already in existence and either deliver goods which are used by the new factory or buy goods produced by the latter
- local spread of markets, which among other things depend on the spread of population and other demand conditions, including public purchases, foreign buyers, import duties, etc.
- institutions and cost of living in different parts of the country
- relative height of local taxes
- interregional differences in wage rates and labour qualities.

Oxley and Yeung (1998) argue that fundamental changes to the production process and the globalisation trend will have effects on the value chain through the rise of particular industries and the emergence of different centres of production. The restructuring of value chain activities has far-reaching implications for industrial processes and the way these are examined in the global context. As industries defined in terms of the 3-digit SIC classification become scattered across various locations, the “location pattern of production” might begin to be at odds with the theoretical predictions of the relative factor endowment notion (i.e. Heckscher-Ohlin trade theory). Oxley and Yeung (1998) contend that it may only be through the examination of disaggregated “sub-industries” based more on “value chain activities” than on end products that a location pattern may emerge that corresponds more closely with the traditional relative factor endowment theory. This approach may assist in bridging the theoretical gap between Marshallian agglomeration theory and the relative factor endowment theory of industry location. That is, agglomeration effects would be strongest for upscale value chain activities, whereas lower scale value chain activities could follow the Heckscher-Ohlin approach. The centre piece of the exercise could then switch from industry location to value chain activity location.

THEORETICAL OVERVIEW

Marshallian Agglomeration Theory

The first major examination of industry concentration and localisation of specialised industry was that of Marshall (1920). Having noticed the concentration of particular industries in particular centers, Marshall suggested that the localisation of industries arose through such factors as:

- physical conditions (climate, soil type and resources such as mineral deposits. Industry location followed easy access to water and mineral deposits, e.g. iron industry close to coal deposits);
- patronage of courts (the demands of a royal court for certain goods attracted skilled workers who passed on their knowledge and led to the replication of those skills even after the court had moved on);
- deliberate invitation of rulers (rulers often invited skilled artisans to settle in specific centres. These workers often passed on skills to the locals, thereby broadening the overall skills base).

Once industry has become localised, it tends to remain in that locality for a considerable time. The advantages of localisation were put forward by Marshall as: the hereditary skills nurtured over time; the growth of subsidiary activities; use of highly specialised machinery; benefits from technological spillovers and a local market for special skills. However, disadvantages could also arise: a heavily localised industry could make extreme demands for one kind of labour, e.g. the dominance of iron industries offered no employment to women so that wages and labour cost were high while average earning for households were low. Also, a region dominated by one industry was vulnerable if this industry experienced reduced demand. The localisation of industries was affected by external factors such as improvements in the means of communication, be it in technical terms or through reduced transportation and freight costs. This would obviate the need for many different industries to concentrate and enable them to rather remain localised some distance from centers of demand.

The issue of agglomeration effects was also examined and was deemed important in two respects:

- results in positive externalities on existing firms already located in an area and
- influences firms' location choice and reinforced positive externalities (positive circle of benefits).

The notion of agglomeration effects is based on the premise that firms in the same industry tend to group together or cluster in particular regions. In economic terms, agglomeration effects arise through financial and technological externalities which encourage industry localisation. In terms of empirical work on agglomeration effects, Head, *et al* (1995) argue that much empirical work needs to be done to establish the extent of the effects of these externalities emanating from geographical proximity.

Weber's Location Theory

Weber (1929) developed two regional cost factors which are fundamental to the location of industry:

- transportation costs and
- labour costs.

Although it can be argued that transport costs are themselves determined by labour costs (see Weber, 1929), they ought to be examined separately to examine their effect on industrial location decisions specifically.

Weber's analysis is extremely important in terms of its treatment of transport and labour costs, i.e. whether it held one of the two components constant while allowing the other to vary. Permitting transport costs to vary while holding labour costs constant, Weber formulated his first general rule: that the location of manufacturing industries would be determined by the ratio between the "weight of localised material and the weight of the product".

The influence of the variation in labour costs would be determined by the "labour coefficient" or the ratio between cost of labour per ton of product (labour index) and the total weight of all goods (raw materials, fuels, etc) transported. The aforementioned total weight was termed the "locational weight". This combination led to the second general rule: "When labour costs are varied, an industry deviates from its transport locations in proportion to the size of its labour coefficient".

Heckscher-Ohlin Theory of International Trade

The Heckscher-Ohlin contribution to international trade theory is so extensively documented in all the comprehensive texts on international trade that it will not be outlined in detail. For example, an excellent reference in this regard for the interested reader is Markusen, *et al*, (1995). The principal tenets of the theory are that a country will export the commodity which intensively uses its relatively abundant production factor. That is, of two countries producing two goods with two factors of production, the country with a relative abundance of labour will export the labour-intensive commodity, while the country with an abundance of capital will export the capital-intensive good. The impli-

cation of this for this paper is that labour-intensive industries will locate in the country with an abundance of labour, while capital-intensive industries will locate in the country with an abundance of capital.

The theory of the *core* and the *periphery*

The work undertaken most recently by Krugman & Venables (1998)(see also Krugman, 1991) puts forward the notion of the existence of a *core* and a *periphery* in economic development and international trade, in the context of globalisation. (The theory is also applicable in the case of regions within a country).

This model uses a world consisting of two regions, North and South, each producing two goods *viz* agricultural (characterised by constant returns to scale) and manufactured goods (characterised by increasing returns). The latter include intermediate goods used in the production process, as well as goods for final demand by consumers. Neither region has a comparative advantage in either of the goods. However, transport costs between the regions are initially extremely high. Each region will be self-sufficient and produce both goods for own consumption.

As transportation costs fall over time, trade between the regions takes place. If there are many different kinds of manufactured goods, two-way trade in these occurs between the regions. If transport costs remain high, no specialisation of activities occurs in the regions. As one region emerges with a stronger manufacturing base, so it will eventually attract more industries involved in intermediate activities (the production process - leading to backward linkages between industries). If one region produces more intermediate goods, better access to these goods will mean reduced costs of production of final goods (forward linkages). This will result in increased movement of manufacturing to that region. When transportation costs fall below a critical level, the global economy will organise itself into an industrialised *core* and deindustrialised *periphery*.

Meanwhile, demand for labour increases in the industrial region or core through the concentration and growth of industry, and a fall in the demand of labour in the periphery. Real wages then fall in the *periphery* and increase in the *core*. "Global economic integration leads to uneven development" (Krugman & Venables, 1998). If transport costs continue to fall, the advantage of being located closer to markets and suppliers begins to decline. The *periphery* then emerges with an advantage in the form of a lower wage rate, to the point where this outweighs the disadvantage of distance from markets and suppliers. Manufacturing activities then moves from the core to the periphery, enabling a convergence of wage rates and economic growth between the regions.

SPATIAL DEVELOPMENT INITIATIVES (SDIs)

The SDI process in South Africa began in 1995 and was the first attempt by the post-1994 government (primarily the Department of Trade & Industry and the Department of Transport) to take economic policy into the implementation arena. It sought to identify key areas of the country which could be the focus for economic development in the post-apartheid era and promote investment in these areas. The areas would be identified on the strength of the core economic activities (along sectoral lines) which characterised the area and then strategies could be devised, focused on these lead sectors. Anchor projects would then also be identified as being the key projects which could initiate and sustain the SDIs into the future. More often than not, the SDIs encompassed existing or proposed transport infrastructure and took the form of a development corridor. A key component would then be the active promotion by government of investment in the anchor projects in the SDIs by the private sector. The role of government would then be to identify projects and to facilitate involvement by interested parties.

An overview of some of the different types of SDIs and their respective sectoral focus is provided below (www.sdis.org.za) (see also Figure 1):

Industrial:	KwaZulu-Natal SDI Fish River SDI Richards Bay-Empangeni SDI Phalaborwa SDI
Agri-Tourism	Lubombo SDI Wild Coast SDI
Mixed sectors	Maputo Development Corridor West Coast Investment Initiative

Other initiatives are in the process of identifying projects, e.g. the Platinum SDI and Gauteng SDI. The SDIs referred to above have identified projects to the value of *R32,4 billion, creating 86 000 jobs*. A breakdown of some of the sectors, and their *direct* relative potential employment opportunities is contained in Table 2 (indirect job creation through backward and forward linkages was not examined in the programme nor in this paper). Regarding job creation, a number of issues arise. Firstly, the SDI programme does not provide a basis or reasoning for the job estimates listed in the programme. Secondly, these job estimates would suffice if there was adequate demand, but then SDIs would not be needed as the jobs would arise out of firm-level demand in any event.

Figure 1: SDIs in South Africa

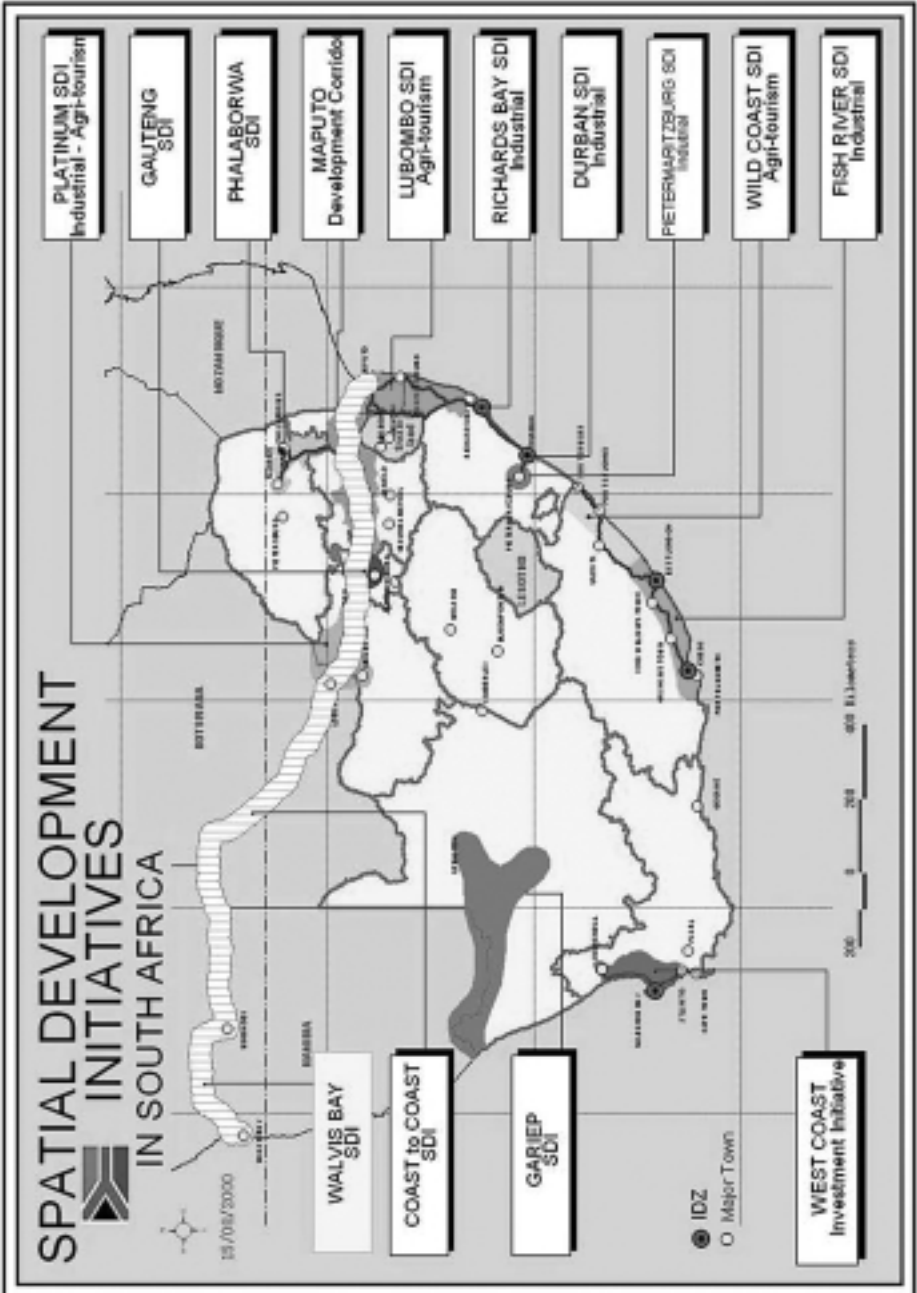


Table 2: SDI capital investment and anticipated employment creation per economic sector

Sector	Number of projects	Fixed capital (Rm)	Jobs (min)	Jobs (max)	Capital required per job (Rands) (max case)
Agriculture & agriprocessing	124	380.40	26,223	26,427	14,394
Fishing & marine products	10	5.14	495	3,460	1,486
Forestry	1	13.00	5,000	5,000	2,600
Automotive & transport	42	1,512.44	7,085	11,649	129,835
Chemicals, rubber & plastics	53	8,915.93	6,483	7,083	1,258,779
Clothing & textiles	29	30.54	2,553	2,553	11,961
Electronics	2	9.50	463	463	20,518
Energy	5	3,062.50	0	0	
Food & beverages	18	936.05	325	350	2,674,440
Furniture & wood products	23	456.66	3,030	12,000	38,055
Infrastructure	112	2,612.18	1,135	1,395	1,872,532
Leather & footwear	5	3.67	230	420	8,731
Machinery & electrical equipment	1	3.00	130	130	23,077
Metals & metal products	59	8,949.53	13,070	13,167	679,694
Mining & minerals processing	52	2,850.0	3,848	3,968	718,247
Nonmetals & non-metallic products	11	473.32	381	381	1,242,322
Other	5	31.37	0	0	
Printing, pulp & paper	2	280.00	1,200	1,200	233,333
Property development	36	121.50	1,459	1,609	75,514
Services	13	78.78	0	0	-
Tourism	165	1,728.00	3,311	3,575	483,354
Total	773	32,378.60	84,942	86,309	375,148

(Source: www.sdis.org.za)

Roberts (2000) examined the performance of various sub-sectors in the manufacturing sector in South Africa between 1990 and 1997 in terms of exports, output and employment. His finding is that even where a number of manufacturing sub-sectors, such as non-ferrous metals and transport equipment, have increased their importance as exporting industries this has been accompanied by decreases in output and employment in these sectors. This data is also useful in terms of this paper in assessing the potential of sectors included in the aforementioned SDI programme. The key data extracted for this purpose from Roberts (2000) are included in Table 3:

Table 3: Summary export, output and employment data for Manufacturing sub-sectors, 1990 to 1997

Sub-sector	% manuf. exports 1991	% manuf exports 1997	Average annual output growth 1990-97 1990-1997	Average annual employment growth
Food & processing*	6.9	3.4	-0.1	-3.5
Beverages*	1.2	1.4	-0.3	-3.1
Tobacco products	0.1	0.2	-1.1	-5.9
Textiles*	3.7	1.9	0.2	-6.4
Clothing*	0.8	0.5	0.8	0.1
Leather products*	0.6	0.7	1.1	-6.0
Footwear*	0.1	0.1	-4.8	-3.6
Wood & products*	0.8	0.3	1.9	1.1
Furniture*	0.6	0.6	1.6	0.0
Paper products*	5.4	2.9	0.6	-0.9
Printing & publishing*	0.2	0.2	0.1	0.5
Industrial chemicals*	8.2	7.5	1.7	
Other chemicals*	1.5	1.7	2.0	-2.4
Petrol & coal products	0.5	4.0	5.7	
Rubber products*	0.4	0.5	-1.3	-1.7
Plastic products*	0.4	0.5	1.2	2.5
Pottery	0.1	0.0	-4.5	
Glass & glass products	0.5	0.2	-1.3	-1.3
Non metallic minerals*	0.7	0.5	-1.0	-3.5
Basic iron & steel*	20.6	11.0	-0.4	-5.4
Non-ferrous metals*	11.8	29.4	7.9	-4.5

Sub-sector	% manuf. exports 1991	% manuf. exports 1997	Average annual output growth 1990-97 1990-1997	Average annual employment growth
Metal products*	3.9	3.4	1.1	-2.6
Mach & equipment*	4.1	5.2	0.9	-3.3
Electrical machinery*	1.4	1.9	-0.2	3.3
Motor vehicles*	3.2	3.4	0.0	-2.6
Transport equipment*	1.0	2.4	-6.2	-9.9
Prof. Equipment*	0.5	0.7	1.2	-2.5
Other Manufacturing*	21.0	15.4	-1.9	-4.0
TOTAL	100.0	100.0	1.0	-2.1

(Source: Roberts, S. "Understanding the Effects of Trade Policy Reform: The Case of South Africa". *South African Journal of Economics*, Volume 68:4. 607-38)

* denotes whether sector is included in SDI programme (see Table 2).

Roberts' finding that many of those sub-sectors which have increased their share of exports between 1991 and 1997 have seen reductions in output and employment growth (i.e increases in exports have not gone together with increased output and employment) remains pertinent when considering the potential for the SDI programme to increase employment in South Africa. As can be deduced from the list of sectors with an asterisk indicating inclusion in the SDI programme, the latter is heavily biased towards traditional sub-sectors of manufacturing. With this in mind, Roberts' finding is all the more crucial for industrial strategy in South Africa. It is apparent that, based on the traditional areas of manufacturing as the SDI programme seems to be, it is largely focused on several sectors which have not increased exports in all cases, and then without fundamental increases in output and employment. This is a major weakness of the programme if it is considered as a job creation mechanism.

EXPORT PROCESSING ZONES & INDUSTRIAL DEVELOPMENT ZONES

EPZs have been successful in several countries, particularly in the Far East. They are also included in the Department of Trade and Industry's (DTI's) Global Economic Strategy. Balasubramanyam (1988) defines an EPZ as "an enclave outside the customs territory of a country". Commodities (e.g. inputs) entering the zone can be processed or stored without incurring customs duties (e.g. import tariffs), while exports from the zones are not liable for duties either. Examples of fiscal and financial incentives

applied in the South East Asian context have included tax holidays, lenient depreciation allowances and exemptions from wage and welfare legislation. The objectives of these schemes in the developing country context include (Balasubramanyam, 1988):

- promotion of manufacturing for export
- creation of employment opportunities
- importation and subsequent usage of foreign technology in the domestic economy
- regional development.

The empirical evidence of the benefits of EPZs as applied seems to be positive both in the Far East and elsewhere. Balasubramanyam (1988) lists studies pointing to the success of EPZs in South Korea, Indonesia, India, Philippines, Singapore, Taiwan and Mauritius. More recently, Johansson and Nilsson (1997) have also argued that EPZs have a substantial role to play as catalysts for economic growth in the areas where they have been applied. In the case of the EPZ in Walvis Bay, Namibia, the verdict seems to be one of success (African Business, 1999).

In the final implementation in South Africa, it seems that the concept of Industrial Development Zones (IDZs) will be implemented. At the time of writing, the scheme has not been finalised nor published officially. However, communication with the Department of Trade and Industries reveals some core elements. Firms locating in the IDZs will be exempt from most tax elements relating to the production process, namely: value added tax, customs duties and import duties, but would still be liable for company tax. Moreover, these firms would be allocated points which would allow them rebates on the cost of assets of setting up in the IDZs if they manufacture a product new to South Africa (hitherto not manufactured), attained a value added component of 35 percent, linkages with other industries, involvement of small and medium enterprises and creation of new job opportunities. A minimum investment of R50 million would be required and reimbursements could range between 50 percent of cost of assets to 100 percent, depending upon the points attained. Possible IDZs will ideally be nominated (e.g. by local authorities) and include the areas of Coega (the only one designated so far), East London, Richards Bay and Gauteng (City Deep and another internal port facility). The IDZs would be located close to transport infrastructure, e.g. ports or airports. Finally, South African labour legislation would apply to firms in the IDZs. It is this latter point that most accurately distinguishes IDZs from EPZs as such.

Regarding the application of EPZs/IDZs in South Africa, their prospects for success in terms of a contribution to output and employment needs to be carefully considered. In several cases, EPZs have involved labour legislation being waived in respect of employers operating in these areas. In the South African case, organised labour has been an extremely important participant in the Nedlac arrangement (involving government, business and organised labour) and has been a key alliance partner of the ruling African National Congress (ANC) party in South Africa together with the South African Communist Party (SACP). It seems apparent that labour legislation would not be waived

in the case of IDZs in this country. Another important element is that of time. Thus, the issue arises of whether the firms locating in the IDZs remain in the country only for as long as the advantages of the EPZ exist. To date, South Africa has found it difficult to attract FDI (see Schoeman *et al*, 2000) and the possibility arises that it could be limited to the IDZs in future, which could be a long term weakness in the economy in that economic development could be restricted to a few pockets of the country. The question also arises as to what happens when the EPZs/IDZs are ever dismantled - is there a possibility that they will simply follow the fate of the industrial parks in the areas of the apartheid-era homelands and Bantustans, e.g. Ciskei (now in the Eastern Cape province) which were deserted as soon as the incentives in the industrial decentralisation programme were removed?² Hopefully not, if the EPZs/IDZs are established in areas with locational advantages in terms of linkages with other industries and good access to export routes which was not the case with the decentralisation programme.

REGIONAL INDUSTRIAL LOCATION STUDY (RILS)

The RILS, completed in 1997, was a comprehensive analysis of the location of South African industry, its performance in terms of exports and competitiveness generally, and an assessment of how it could perform in the future (Industrial Development Corporation, 1997).

Table 4 presents the characteristics of the various provinces in terms of their economic relationships with other provinces in South Africa and the rest of the world. On the output side, data was examined in the RILS regarding the various provinces, that is whether they produce for intermediate demand in the province, final demand in the province, exports to other provinces and international exports. On the inputs side, the provinces were examined in terms of whether they imported from other provinces, from the rest of the world or from local (within the province) sources.

Table 4 indicates that KwaZulu-Natal province is the most export-oriented province, with 18.5 percent of output being exported internationally and a resulting lesser dependence on other provinces as a market (64.9%). The province also shows a relatively high proportion of output being taken up by intermediate demand (12.1% of output). Gauteng exhibits a similar pattern in that it shows the least dependence on other provinces as a market (56% of output) and international exports of 13.6 percent of output which is supported by a high intermediate demand for output (24.5% of output) and relatively high final demand (5.9%). It is significant that the provinces of Western Cape, Northern (Limpopo) Province and Mpumalanga, all "border" provinces albeit two inland, show a high proportion of international exports (12.8%, 13.1% and 14.4% respectively) with low levels of final demand in the two inland provinces (1.7% and 0.7% for Northern Province and Mpumalanga respectively). The provinces of Northern Cape and North West have the highest proportions of exposure to other provinces as markets (89.7% and

87.8% respectively) and the lowest intermediate and final demand within the province, indicating a low level of industrial beneficiation capacity in these provinces.

In terms of inputs, Gauteng, KwaZulu-Natal and Western Cape show a strong leaning to local (within province) sources (53.8%, 40.6% and 41.1% of inputs respectively). Provinces such as Eastern Cape (18.7% of inputs) and Mpumalanga (16.9% of inputs), due to their proximity to external supplies but also as a result of their being relatively less-developed industrially. Gauteng and KwaZulu-Natal also show a reliance on international imports (15.1% and 16.1% respectively). The Northern Cape, Free State, Northern (Limpopo) Province and Eastern Cape all import from other provinces to a significant extent (67.9%, 63.5%, 59.5% and 58.9% of inputs respectively).

Table 4: Provincial economic demand for inputs and outputs (%)

Province	Demand for Total Output (%)*				Intermediate Input Demand (%)*			
	Internal Demand		External Demand		Internal Demand		External Demand	
	Intermediate Demand (%)	Final Demand (%)	Provincial Exports (%)	International Exports (%)	Imports from Other Provinces (%)	International Imports (%)	Local Sources (%)	
Eastern Cape	5.1	1.9	84.6	8.4	58.9	18.7	22.4	
Free State	3.8	3.3	80.2	12.7	63.5	8.6	27.9	
Gauteng	24.5	5.9	56.0	13.6	31.1	15.1	53.8	
KwaZulu-Natal	12.1	4.5	64.9	18.5	43.3	16.1	40.6	
Mpumalanga	6.4	0.7	78.5	14.4	47.0	16.9	36.1	
North West	2.8	1.0	87.8	8.4	55.1	8.4	36.5	
Northern Cape	1.7	0.7	89.7	7.9	67.9	8.6	23.5	
Northern (Limpopo) Province	1.7	1.5	83.7	13.1	59.5	11.0	29.5	
Western Cape	9.6	5.1	72.5	12.8	44.1	14.8	41.1	

* Each of Output and Input sum separately to 100% for each province
(Source: Industrial Development Corporation, Regional Industrial Location Study, Executive Summary, 1996)

Sectoral concentration and export competitiveness

The RILS included the calculation of two ratios aimed at categorising the various sectors in the provinces in terms of their concentration using the location quotient (product specialisation ratio or PSR) and their competitiveness (export specialisation ratio or ESR). The PSR was calculated as follows:

$$\text{PSR} = \frac{\text{(Share of a region's product/Total of all regions)}}{\text{(Share of a region's GGP/Total GDP of SA)}}$$

The ESR was calculated as:

$$\text{ESR} = \frac{\text{(Exports of sector X in province/output of sector X in province)}}{\text{(Exports of sector X in SA/Output of Sector X in SA)}}$$

The sectors in each province were evaluated in the RILS according to whether they performed well in terms of either ratio, neither or both. Those sectors which had a high PSR and ESR were termed “performers”. The categorisation of sectors per province is contained in Table 5. The table shows that only sectors in five provinces managed to attain the status of “performers” (the strongest being KwaZulu-Natal), while the situation was not much different in terms of the next category, “Small but Export focused”. Provinces such as Free State displayed a distinct inward focus, while the Northern Cape showed only “Weak Sectors” in its economic portfolio. Gauteng showed itself to have a spread of industries in all categories, indicating some level of restructuring necessary. Mpumalanga and North West failed to show themselves strongly in the “Performers” block. However, both KwaZulu-Natal and Western Cape came up with industries in all categories but the weakest.

Table 5: Sectoral performance in terms of PSR and ESR per province (Definitions of categories set out in section 3.1)

RILS Category	KwaZulu-Natal	Western Cape	Northern Cape	Free State	Eastern Cape	Mpumalanga	Northern Province	Gauteng	North West
Performers High ESR High PSR	Basic metals Chemicals Paper Wood Fabricated metals	Chemicals Food proc		Non-metallic minerals prod Fabricated metals	Textiles			Textiles Wood	
Small but Export Focus High ESR Low PSR	Food proc Fabricated metals	Fabricated metals Basic metals Textiles		Textiles Food proc Wood	Textiles Food proc Wood		Basic metals	Non-metallic minerals Chemicals Basic metals	Paper Textiles Fabricated metals
Internal Focus Low ESR High PSR	Textiles Non-metallic minerals	Non-metallic minerals Wood		Chemicals Food proc Wood Paper Non-metallic minerals	Basic metals Paper	Food proc Paper Basic metals Non-metallic minerals	Food proc Chemicals Paper Non-metallic minerals	Fabricated metals Non-metallic minerals Chemicals Basic metals	Basic metals Chemicals Food
Weak sectors Low ESR Low PSR		Paper	Wood Basic metals Textiles Chemicals Food proc Fabricated metals Paper Non-metallic minerals	Fabricated metals Basic metals	Chemicals	Chemicals Fabricated metals Wood	Wood Textiles Fabricated metals	Food proc Paper	Non-metallic minerals Wood

(Source: Industrial Development Corporation, Regional Industrial Location Study, 1997)

For the present discussion, the “Performers” group identified in the RILS has been evaluated in terms of their export, output and employment performance (as set out in Roberts, 2000), and in terms of whether they were labour- or capital-intensive (using data from International Monetary Fund, 2000).

Firstly, the contribution of these “Performers” sectors to exports has declined between 1991 and 1997, as Table 6 shows:

Table 6: Percentage contribution to exports of RILS “Performers” sectors, 1991 and 1997:

Sector	% exports, 1991	% exports, 1997
Food processing	6.9	3.4
Wood & products	0.8	0.3
Paper & products	5.4	2.9
Chemicals	8.2	7.5
Textiles	3.7	1.9
Basic metals	20.6	11.0
Fabricated metals	3.9	3.4
Non-metallic mineral products	0.7	0.5

(Source: Roberts, S. “Understanding the Effects of Trade Policy Reform: The Case of South Africa”. South African Journal of Economics, Volume 68:4. 607-38).

Table 6 shows that without exception, all of the sectors identified as “Performers” in the RILS exhibited a decrease in their contribution to total exports between 1991 and 1997, e.g. Paper and Paper Products 5.4% to 2.9%, Chemicals 8.2% to 7.5% & Fabricated Metals 3.9% to 3.4%). Next, the “Performers” sectors were then analysed in terms of output and employment growth, capital/labour ratio and skilled/unskilled labour ratio (see Table 7).

From Table 7, it is apparent that overall, the sectors identified by the RILS as “Performers” failed to acquit themselves well in terms of both output and employment growth between 1990 and 1997. In the case of output growth, there was either small annual average percentage growth per annum (the highest being 2% per annum for output in the case of Chemicals, 1.9% p.a. for Wood and Wood Products and 1.1% for Fabricated Metals) or declines in these variables (Non-Metallic Mineral Products -1% p.a., Basic Metals -0.4% p.a. and Food and Food Processing -0.1% p.a.). In the case of employment growth, only Wood and Wood Products was positive (1.1% p.a.), with reductions in employment for

the rest (e.g. Textiles -6.4% p.a., Basic Metals -5.4% p.a. and Non-Metallic Minerals -3.5% p.a.). A number of these sectors are also capital-intensive, e.g. Paper & Paper Products (K/L ratio of 1.25), Chemicals (K/L ratio of 1.18) and Food and Food Processing (K/L ratio of 1.16), seemingly going counter to the Heckscher-Ohlin framework if one is of the opinion that South Africa is labour-abundant. Some of the remainder showed a tendency towards capital-intensity rather than labour. The ratio of skilled to unskilled labour was also highest for those sectors with high capital/labour ratios, e.g. Chemicals (2.05) and Food Processing (1.42).³

Table 7: Evaluation of sectors categorised as performers by RILS

RILS "Performer" Sector	Output growth 1990-1997 (Roberts, 2000)	Employment growth 1990-1997 (Roberts, 2000)	Capital/ Labour ratio (IMF, 2000)	Skilled/ unskilled labour ratio (IMF, 2000)
Food processing	-0.1	-3.5	1.16	1.42
Wood & products	1.9	1.1	0.90	1.19
Paper & products	0.6	-0.9	1.25	1.17
Chemicals	2.0	-2.4	1.18	2.05
Textiles	0.2	-6.4	0.75	0.82
Basic metals	-0.4	-5.4	0.81	1.36
Fabricated metals	1.1	-2.6	0.76	1.29
Non-metallic mineral products	-1.0	-3.5	1.05	1.14

(Sources: Roberts, S. "Understanding the Effects of Trade Policy Reform: The Case of South Africa". *South African Journal of Economics*, Volume 68:4. 607-38 & *International Monetary Fund*. 2000. *South Africa: Selected Issues*. IMF Staff Country Report 00/42. March).

CONCLUSIONS

The analysis has shown that key components of government's Global Economic Strategy, namely the SDI programme, EPZs and sectors identified as "Performers" in the RILS exhibit fundamental weaknesses.

Firstly, the industries seeming to comprise the bulk of the anticipated SDI investment in “anchor” projects have shown themselves unable to secure output and employment gains even where they have managed to increase their contributions to exports. Secondly, the EPZ/IDZ programme, while having a strong track record in the Far East, will still require the backing of organised labour to succeed and even then there is the risk that development arising out of investment in terms of this programme will be restricted to a few pockets and areas of the country. Finally, the analysis of the “Performers” identified in the RILS indicates that they have not featured well in terms of export performance, output and employment growth. Moreover, these industries seem to be concentrated in a few provinces, e.g. KwaZulu-Natal, and seem to be largely capital-intensive, a contradiction of the Heckscher-Ohlin theory. Therefore, relating to the hypothesis posed at the outset of this paper, it is argued that the components of the GES which have some geographical aspect (SDIs, EPZs/IDZs & RILS) will not automatically result in increased manufactured exports from South Africa.

NOTES

- 1 The terms Export Processing Zone (EPZ) and Industrial Development Zone (IDZ) are used together in this paper because it is not clear which of these the Department of Trade & Industry will opt for in future. Both are mentioned in documentation, the former in the Global Economic Strategy (GES), the latter in broad declarations of incentives, e.g. on www.dti.gov.za. No final, detailed information has been released on either. Information on the IDZs was obtained through consultation with officials of DTI and relates to work in progress. The distinction between the two probably lies in the treatment of labour, dealt with later in this paper.
- 2 Maasdorp (1990) in an examination of regional industrialisation policy in South Africa between 1939 and 1979 concludes significantly that industrial dispersal did not materialise.
- 3 Analysis of the RILS categories of sectors was limited to that of the “Performers” as the most promising category. Analysis of the other categories, e.g. “Small but Export Focus”, “Internal Focus” and “Weak” was excluded from the paper as these are either not export-focused or revealed similar weaknesses to those of the “Performers”.

BIBLIOGRAPHY

- Balasubramanyam, V.N. 1988. Export Processing Zones in Developing Countries: Theory and Empirical Evidence. In *Economic Development and International Trade*. Greenaway D. (Ed). London: MacMillan.
- Department of Trade and Industry. 2001. *Global Economic Strategy*. Pretoria.
- Development Bank of Southern Africa. 2000. *Inter-Provincial Comparative Report of the Provinces of South Africa*. Midrand.
- Development Bank of Southern Africa. 1998. *Provincial Development Profiles*. Midrand.
- Industrial Development Corporation. 1997. *Regional Industrial Location Study*.
- International Monetary Fund. 2000. *South Africa: Selected Issues*. IMF Staff Country Report 00/42. March.

- Johansson, H. and Nilsson, L. 1997. Export Processing Zones as a Catalyst to Development. *World Development*. December.
- Johnson, J.T. 1981. *Location and Trade Theory: Industrial Location, Comparative advantage and the Geographic Pattern of Production in the United States*. Chicago: University of Chicago, Department of Geography Research Paper No. 198.
- Krugman, P. 1991. *Geography and trade*. Cambridge: MIT Press.
- Krugman, P.R. 1993. On the Relationship between Trade Theory and Location Theory. *Review of International Economics* 1(2): 110-22.
- Krugman, P. and Venables A.J. 1998. Globalisation and the Inequality of Nations. In *Structural Change, Industrial Location and Competitiveness*, Oxley, J.E. & Yeung, B. (Eds). Cheltenham: Edward Elgar.
- Maasdorp, G. 1990. Introductory Survey: Regional Policy in South Africa. *South African Journal of Economics*. 58(2).
- Markusen, J.R., Melvin, J.R., Kaempfer, W.H. and Maskus, K.E. 1995. *International Trade: Theory and Evidence*. New York: McGraw-Hill.
- Marshall, A. 1920. Industrial Organisation, Continued. The Concentration of Specialised Industries in Particular Localities, in *Principles of Economics, Book IV: The Agents of Production, Land, Labour, Capital and Organisation*, Chapter X, Ninth Edition, London: MacMillan & Co. 267-77.
- Ohlin. B. 1967. *Interregional and International Trade*. Revised Edition. Cambridge: Harvard University Press.
- Ohlin, B., Hesselborn, P. O. and Wijkman, P.M. 1977. *The International Allocation of Economic Activity*, (Proceedings of a Nobel Symposium held in Stockholm). London: MacMillan Press.
- Oxley, J.E. and Yeung, B. (Eds). 1998. *Structural Change, Industrial Location and Competitiveness*. London: Edward Elgar Publishing.
- Roberts, S. Understanding the Effects of Trade Policy Reform: The Case of South Africa. *South African Journal of Economics*, Volume 68:4. 607-38.
- Schoeman, N.J., Clausen Robinson, Z. and De Wet, T.J. 2000. Foreign Direct Investment Flows and Fiscal Discipline in South Africa. *South African Journal of Economic and Management Sciences* 3(2), June.
- Weber, A. 1929. *Theory of the Location of Industries*. (Friedrich, C.J. Ed). Chicago: University of Chicago Press.