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The Structure and Competitiveness of South African Trade

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Introduction

Since the early 1980s South Africa's trade policy regime has shifted from one of import substitution towards one of export orientation. This shift has been encouraged by trade liberalisation which accelerated in 1994 with tariff liberalisation, export orientation policies that ranged from direct support (GEIS) to marketing related support, and the GEAR macroeconomic strategy that was explicitly expected to transform South Africa into a "competitive, outward orientated economy" (GEAR, 1996). Accompanying each of these policies is some instrument that is used to gauge the effectiveness of the policy in raising the competitiveness of South African exports. For example, the trade liberalisation and export promotion policies aim to reduce the anti-export bias associated with South Africa's history of protection (Holden, 1992, Bell *et al*., 1993, IDC,1997). The GEAR strategy aims to enhance the competitiveness of South African production by stabilising the real effective exchange rate at a competitive level over time.

The success of these policies has been mixed. Manufacturing exports have grown rapidly since the mid 1980s and now account for 43.8 % of total exports. Export orientation has also risen with the share of production rising from 6.6 % in 1984 to 22 % in 1998. While some of this growth was driven by surplus domestic production capacity in the 1980s and early 1990s, the continued rise in exports since 1993 as domestic demand recovered suggests that shift towards export markets has become permanent. Yet the structure of trade is still very capital and skill intensive (Bell and Cattaneo, 1997, Edwards, 2001b) and appears out of norm with other middle income countries (Tsikata, 1999). Some of this is due to number of capital biased domestic supply side policies, but the inability of labour intensive sectors to compete has also played a role (Edwards, 2001b). Employment in manufacturing has also continued to fall since many of these policies were implemented. Finally, while exports have grown, this growth is not significantly greater than other dynamic emerging countries (Golub, 2000).

This paper evaluates the competitiveness of South African production during the 1990s. Through this some insights into the mixed performance of South African exports can be achieved. The paper is structured in three parts. The first part provides a detailed review of measurements used to analyse the changing competitiveness of South African exports. The second part utilises a variety of classifications to present an overview of the changing commodity and regional structure of South African manufacturing trade. The third part utilises a 'dynamic' Revealed Comparative Advantage measure to analyse the changing competitiveness of South African exports at a sectoral level.

1. Review of SA export competitiveness

Approaches to the analysis of competitiveness in South Africa

Attempting to measure the changing competitiveness of an economy is further made complex by the diversity of measures that are available. As Turner and Van 't dack (1993) quoted in Kahn (1998) note: "*..no single, comprehensive measure of competitiveness can be regarded as the appropriate indicator. Some measures are clearly defective, and all are incomplete*". The choice of measurement is thus influenced by the particular question or facet of

competitiveness that one wishes to deal with. Thus Bell, Farrell and Cassim (1999) focus on macro-competitiveness and exam the historical relationship between GDP growth and the ratio of the current account deficit to GDP.[1] Other papers, including this one, utilise measures that focus on the cost or price competitiveness of South African production. The choice of measure is also frequently constrained by the availability of suitable data. Given this it is not unexpected that the literature on competitiveness in South Africa is diverse and covers a broad range of competitiveness measures.

This section of the paper presents an overview of the literature on competitiveness in South Africa. Its objective is to highlight the various measures used, with an emphasis on their results, their limitations and their relationship with export performance. The measures used in the analyses of South African competitiveness can be grouped into the following categories: (a) real effective exchange rates, (b) wage - productivity relationships, (c) structure of trade analyses, (d) revealed comparative advantage indicators and (e) other composite indicators. In the following section each of these will be discussed.

Real effective exchange rates (REER)

A narrowly defined notion of competitiveness is that of international cost and price competitiveness which measures the comparative prices or costs across countries in a common currency (Golub, 2000: 9). This measure, the real exchange rate, is calculated as $q = ep/p^*$ where the exchange rate, e, is the foreign currency per unit domestic currency), and p/p^* is the ratio of domestic prices (costs), p, to foreign prices (costs), p^*. Assuming imperfect substitutability between traded goods[2], if domestic prices, p, rose faster than foreign prices, p^*, the real exchange rate, q, would appreciate (rise) reflecting a decline in competitiveness of domestically produced goods.

Depending on data availability and the theoretical approach taken, the choice of p will vary between consumer price (CPI) indices, wholesale price indices, GDP deflators, export and import unit values and unit labour costs. Each have their drawbacks (see Kahn, 1998, Walters and de Beer, 1999, and Golub, 2000) although the latter are widely accepted as the most appropriate measure of a country's productivity, domestic production costs, real factor incomes, and therefore competitiveness (Kahn, 1998: 18).

The real exchange rate above is useful to analyse bilateral competitiveness. To analyse competitiveness of a country vis-à-vis all trading partners these bilateral real exchange rates are weighted and combined into a composite index called the real effective exchange rate (REER). The choice of weights varies widely in the literature, although the bulk utilise a combination of export and import shares, with some (IMF, 1998, Walters and de Beer, 1999) including the impact of third country competition.

The analysis of REER has dominated the literature on international competitiveness in South Africa. The debate has largely centred on the appropriate choice of both prices and weights utilised in the calculation of the REER (IMF, 1998, Kahn, 1998, Walters and de Beer, 1999, and Golub, 2000). Less work has dealt explicitly on the relationship between REER

[1] Macro-competitiveness refers to the ability of a country to realise economic goals without running into balance of payment difficulties (Bell *et al*., 1999).
[2] If traded goods were perfect substitutes or purchasing power parity held, then q would not vary over time (Golub, 2000: 10).

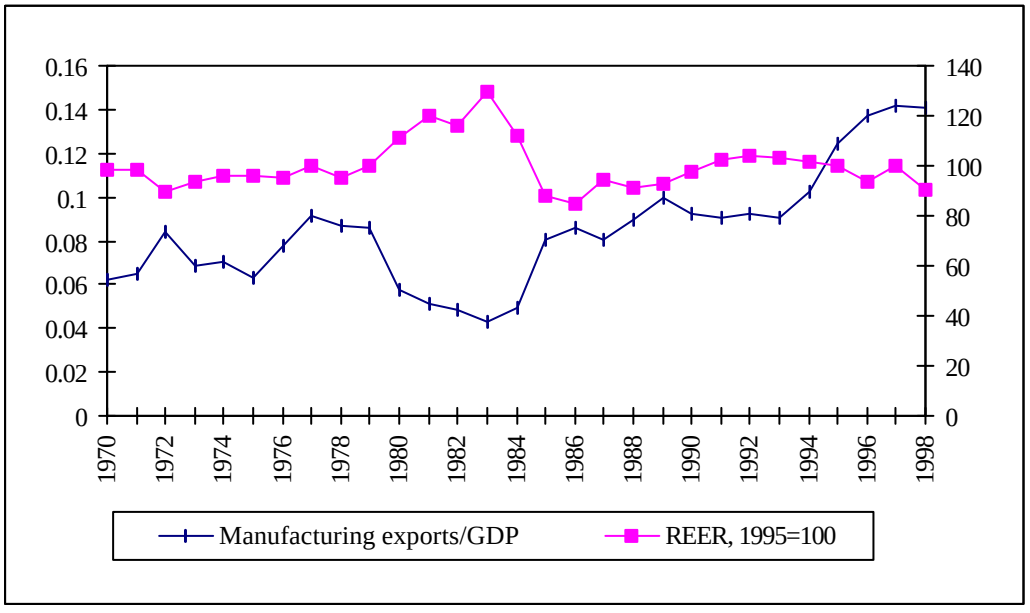
movements and international trade flows, with Fallon and Pereira de Silva (1994), Tsikata (1999) and Golub (2000) the exceptions.

The bulk of the work on the correct measurement of REER arose from criticisms arising from the inadequate weighting of prices by the Reserve Bank. The Reserve Bank calculated REER using CPI indices but used only 4 regions - Europe (31.6 %), USA (42.8 %), UK (16.7 %) and Japan (8.9 %) - in deriving it. These weightings (in brackets) and regions inadequately mapped trade flows from either the import or export side. As result, the IMF (1998) argued, the extent of the improvement in competitiveness, particularly in recent years, was overstated. Using a variety of more realistic weights Kahn (1998), Walters and de Beer (1999) and Golub (2000) have re-estimated the REER and have in general confirmed the IMF (1998) criticism. Yet, while differences emerge under different weightings, in the long run these are largely marginal. From the perspective of changes in the direction of competitiveness the choice of weights used in the South African debate does not appear critical.

This is not the case in the choice of price indices. Golub (2000) notes that the REER calculated using CPI indices shows a long term decline over 1970-98 that is less apparent when using the GDP deflator, manufacturing value added deflator, wholesale price index and the unit labour cost indicators. Kahn (1998) also finds that the Reserve Bank PPI based REER overstates competitiveness in comparison with a unit labour cost based REER. Despite these differences there is a substantial correlation in the turning points of the REERs, especially after 1970 (Golub, 2000). Further, in all cases the general trends are similar, with each measure, for example, showing an improvement in South African competitiveness between 1992 and 1998.

While the debate on the correct measurement of REER is important, from a competitiveness perspective what is really important is the extent to which the improvement in competitiveness since 1994 as outlined by the REER series has increased South African exports.

Figure 1: Export performance and real exchange rates.



Source: TIPS for data on trade and Reserve Bank Quarterly for the REER series. The REER is calculated using CPI indices and is based on weights used by Walters and de Beer (1999).

Figure 1 compares the REER using CPI indices with manufacturing exports/GDP calculated using current prices. As shown in the figure, the REER exchange rate appreciated during the 1970s with the rise in the gold price, but declined sharply in the mid 80s driven largely by the collapse in nominal exchange rate. The REER appreciated subsequently, driven by the relatively higher inflation in SA and large inflows of portfolio capital (Tsikata, 1999). Since 1992 the REER once again declined, although its movements have been highly volatile, particularly in 1996 and 1997.[3]

Although the high volatility of the REER means that it fails to provide a consistent signal to exporters (Tsikata, 1999), exports do appear to have responded to changes in the REER. As shown in Figure 1, a negative relationship between REER and manufacturing exports/GDP exists. Declines in the REER increased the competitiveness of South African exporters resulting in significant increases in the exports of South African products. This relationship is confirmed in the econometric analyses by Fallon and de Silva (1994), Tsikata (1999) and Golub (2000) who estimate REER elasticities of exports between 0.63 and 1.4. A one percent decline in REER (1 % improvement in competitiveness) is estimated to raise manufacturing exports by between 0.63 % and 1.4 %.

Despite this relationship, it is unclear to what extent (a) a depreciation of the real exchange rate will alone stimulate exports, and (b) the decline in REER since 1992 can account for the significant growth in exports since 1994. Turner and Van 't dack (1993) (cited in Kahn, 1998) note that the link between economic performance and movements in REER is not unambiguous, in that a change in the REER can both be a *cause* and a *result* of its economic performance. For example an appreciating exchange rate (interpreted as a decline in competitiveness) can be caused by strong growth, increased demand for domestic goods, improvement in terms of trade or an overvaluation of the domestic currency. Further, even if competitiveness according to the REER improved, the ability of firms to respond depends on a number of structural issues such as the availability of good infrastructure, access to finance (particularly for SMMEs), access to foreign markets which are frequently negotiated at government level, and established long term linkages with export markets. In a recent survey of knowledge intensive industries, it was found that foreign tariffs, regulations affecting export shipments and foreign licences limiting access to export markets were obstacles to the operations of the firms, particularly for large machinery and equipment producers. Further, these firms found the reliability and cost of transport services in harbours and airports an obstacle to their operations (Edwards, 2000).

These points relate to the relationship between the decline in REER and the growth in exports since 1993 mentioned in point (b). While the REER declined between 1993-97, this change appears too small to account for the large increase in exports that took place during this period. Other structural changes such as the ending of sanctions (IMF, 1998) and the reduction of the anti-export bias (see Belli *et al*., 1993, and Tsikata, 1999), account for much of this growth. [4] This makes the interpretation of the upward trend difficult as many of these changes will merely have resulted in a once-off, and not long term, growth in exports. The slow down in export growth since 1996 shown in Figure 1 suggests that this may be the case.

[3] Much of this volatility has been induced by large portfolio flows moving in and out of the economy.
[4] In the export demand function estimated by Tsikata (1999) tariff reductions had a positive impact upon export growth.

A further problem in utilising REER movements as an indicator of international competitiveness is its failure to capture changes in competitiveness at a sectoral and regional level. This may not be problematic in the standard developed – developing country model where the structure of trade is largely inter-industry trade, but in middle income countries where the structure and composition of trade differs according to who one trades with, it may become more problematic. For example South African exports to developed countries are in general more low tech than their exports to Africa. Although, the importance of each trading country is captured in the weights the aggregate index does not adequately reflect the diversity of competitiveness at the regional level. Because South African trade is dominated by developed regions, an export weighted REER may be biased towards the competitiveness of low technology and natural resource based products. In addition, because of the greater weighting attributed towards developed country trade, an improvement in competitiveness as revealed by a decline in the REER, is entirely consistent with declining competitiveness vis-à-vis developing countries.

A complementary analysis would be one that separately analysed the competitiveness of South African production vis-à-vis developed and developing regions or analysed bilateral real exchange rate. Tsikata (1999) compares bilateral real exchange rates vis-à-vis South Africa since 1994 for a number of developing countries. She notes that although South Africa had gained competitiveness against most of the selected countries, much of these gains were lost in 1997 as South Africa's real exchange rates appreciated. This effect and the greater weighting attributed to developing countries explains the less optimistic improvement in competitiveness displayed in the IMF (1998) REER series than in equivalent Reserve Bank weighted REER series.

The inherent problems in using an aggregated index to analyse competitiveness at a sectoral level are also expounded by Wood (1995) and Bell *et al*. (1999). As Wood (1995: 70) notes: "*modelling at the aggregate level is likely to be misleading unless the trends in all the disaggregate categories are the same*". A high proportion of South African manufacturing exports consists of natural resource based products which are subject to fluctuations in the commodity price cycle. Thus during the 1970s rising world prices of natural resource intensive products insulated producers of these products from adverse effects arising from the gold price driven increases in the REER (Bell *et al*., 1999). In contrast, the more downstream, non commodity manufacturing sectors experienced significant declines in competitiveness. Since the mid 1980s, the competitiveness of natural resource intensive products has declined while that of the non-commodity sectors has risen and, according to Bell *et al*. (1999), explains the relative rise in share of non-commodity products in total manufacturing exports. Wood (1995) disputes the similar conclusion reached in an earlier paper (Bell, 1993), and in his sectoral regressions explaining the share of exports in world exports finds no support for Bell's (1993) view that real or nominal exchange rates have influenced exports of 'non-traditional' exports. His results do support the view that exports of natural resource intensive products are related to nominal and real exchange rate movements.

It appears then that an improvement in the aggregate REER is neither a necessary nor a sufficient indicator of export competitiveness. A policy that solely focuses on REER as a tool for stimulating export growth, without dealing with the capacity of domestic firms to respond to the changing incentives is likely to be inadequate. Further, important commodity and regional level information is lost in the composite REER index. Nevertheless, the close relationship between exports and REER shown in Figure 1 suggests that a competitive REER

are will complement other strategies implemented to improve South Africa's export performance.

Wage-productivity relationships

A further problem with REER series as indicators of competitiveness is that while they reveal changes in competitiveness over time, they do not compare absolute levels of competitiveness as based on price or cost comparisons (Golub, 2000). One approach is to compare unit labour costs which reflect the labour costs per unit output. In this approach competitiveness is a function of wages relative to productivity. Thus a country in which labour is half as productive vis-à-vis a competitor in the production of a commodity can still compete if its wages are not greater than half the competitors wages.

Golub (2000) compares South African wages and labour productivity in aggregate manufacturing relative to a number of industrial and developing countries. His results suggest that South African labour costs in the 1990s were competitive vis-à-vis industrial countries. Although South African labour productivity is low, in most cases relative labour wages are even lower (Golub, 2000: 34). The competitiveness of labour costs vis-à-vis industrial countries also improved between 1990 and 1998, which is consistent with the downward trend in REER highlighted earlier. In contrast, labour costs in South Africa are not competitive vis-à-vis almost all developing countries that are major exporters of manufactures.[5] While South African labour productivity is generally relatively high, relative wages are even higher. Some improvement is evident between 1990-96 as relative wages declined with the real depreciation of the rand during 1996. However, the large depreciations in Asia and Latin America since 1997 will have substantially reversed some of these gains.

The poor competitiveness of South African labour costs relative to middle income countries is supported by anecdotal evidence provided by Schlemmer and Levitz (1998). Although no formal comparison between wages and productivity are made, they note that labour productivity in South Africa increased at broadly similar rates to some middle income countries (Malaysia), but wage growth in South Africa was not as restrained. Compared to other middle income countries, average metropolitan industrial wages in South Africa were effectively 1.7 times higher.

The analysis of unit labour costs in aggregate manufacturing suffer some of the same criticisms as that of REER, particularly the failure to analyse competitiveness at the sectoral level. Analyses of unit labour costs in South Africa at the sectoral level are unfortunately not widely available. Nordas (1996) compares the ratio of relative wages over relative labour productivity, $(W_{US}/W_{SA})/(VA_{US}/VA_{SA})$, where W_i and VA_i are the wage bill and value added for country *i* respectively, with the U.S. for 22 industrial sectors using 1990 data.[6] A value greater than 1 signals that South Africa is competitive relative to the U.S.

Nordas (1996) finds that the index is greater than 1 only for non-ferrous metals (1.67) with iron & steel (0.76) and printing & paper (0.71) close to 1. The least competitive sectors are chemicals (0.3), food, beverages & tobacco (0.4) and computers & office equipment (0.42). By categorising manufacturing along a number of dimensions she concludes that South Africa is relatively (but not absolutely as shown in the competitiveness index) competitive in

[5] SA unit labour costs were higher than the following countries in 1990 and 1996: India, Indonesia, Korea, Malaysia, Thailand, Chile, Brazil, Mexico, Mauritius, Zim, and Poland.

[6] It is not necessary to utilise average wage and productivity per labour as the labour input cancels out.

medium wage, low technology and resource intensive industries. In general these conform with the pattern of South African trade in the 1990s.

The approach and results are interesting, but given changes in the economy since 1990 are difficult to extrapolate to recent years. For example, the depreciation of the real exchange rate since 1990 would have improved our cost competitiveness. Also in 1990 South Africa was in a recession which tends to lower the unit labour costs for each sector. As Golub (2000: 13) notes labour productivity may exhibit short-run counter-cyclical movements as firms "hoard" labour in recessions. The poor competitiveness across all sectors may, thus, be over-exaggerated.

While the approaches by Nordas (1996) and Golub (2000) provide some insight into the cost competitiveness of South African labour, it is unclear from their analysis whether changes in this variable are linked to changes in South African trade with these regions. We would expect a rise in cost competitiveness vis-à-vis a particular country to result in an improvement in the trade balance with that country. An interesting study would be one which directly tackled the relationship between export performance and unit labour costs both at a sectoral and aggregate level.

It is also not clear what is driving the general improvement in the wage productivity relationship in the 1990s shown in Golub (2000). Ideally, as productivity in labour surplus economies improved through greater access to technology directly or imbedded in imported capital and intermediate goods, there will be a positive impact on employment growth (the Lewis model). However, in South Africa's case the rise in productivity has corresponded with a decline in employment, suggesting that productivity increases have been achieved through raising the marginal productivity of labour by "artificially" raising the K/L ratio through shedding labour. Whether this is due to demand side (trade and technology) pressures or labour market forces that are increasing the cost of employment needs further analysis. However, if it were the latter, this would not signal an improvement in international competitiveness as to remain competitive in the face of higher wages the firm has been forced to reduce its labour force, and thus potential output. As Golub (2000: 39) notes"*ex post* correlation of labour costs and productivity does not itself prove that labour costs are not too high."

Revealed comparative advantage measures

A third common measure used to analyse the competitiveness of South African exports are a range of revealed comparative advantage (RCA) measures. Given the difficulty in analysing pre-trade prices, indirect methods using post-trade data have been used to 'reveal' a country's comparative advantage (see Greenaway and Milner, 1993). Various forms of these RCA measures have been used to analyse the existing and changing comparative advantage of South African trade (Edwards, Mlangeni, and Van Seventer, 2000, Valentine and Krasnik, 2000, and GESP, 2001).

The primary measure used in South Africa is one in which the share of commodity *j* in a country's total exports is compared to the share of that commodity in world exports. Using this approach the RCA of commodity *j* is defined as:

$$RCA_j = \frac{X_{i.j}}{\sum_j X_{i.j}} \Big/ \frac{X_{w.j}}{\sum_j X_{w.j}} \quad (1)$$

where *i* refers to countries 1,.....,n, (total of n countries in world), *j* stands for commodities 1, ..., m and *w* stands for world, thus $X_{w.j} = \sum_{i=1}^{n} X_{i.j}$. In this equation we are comparing the share of commodity 'j' in country 'i's total exports, $\frac{X_{i.j}}{\sum_j X_{i.j}}$, with the world share of commodity 'j' in total world exports, $\frac{X_{w.j}}{\sum_j X_{w.j}}$. All values greater than 1 signal that the country has a revealed comparative advantage in the production of that product. For example, if paper constitutes 10 % of South Africa's exports, but constitutes 5 % of world trade then South Africa would have a RCA (=2) in the production of paper. Numerous other measures are also used, but the results of these are very similar. Edwards *et al*. (2000) find that correlation coefficients between these measures generally exceed 0.8.

The results of the studies by Edwards *et al*. (2000) and Valentine and Krasnik (2000) are broadly similar, although the latter is more extensive and uses SITC data at the 4 digit level (as opposed to an aggregated 26 commodities in the former). South Africa is revealed to have a comparative advantage in the production of agriculture, mining and manufacturing products relating to these sectors (Table 1). These results appear consistent with those of Nordas (1996) and suggest that South Africa is relatively competitive in the production of mineral and agricultural resource intensive products. South Africa is revealed to have a comparative disadvantage in the production of the more high technology products such as electrical machinery, apparatus & appliances (Edwards *et al*., 2000, and GESP, 2001).

Table 1: Top 5 RCA commodities for South African exports

Valentine and Krasnik (2000) for 1995	Edwards *et al*. (2000) for 1996	GESP (2001) for 1998
Coal, coke and briquettes	Sugar, sugar preparations and honey	Minerals
Inorganic chemicals	Pulp and waste paper	Basic manufacturing
Metalliferous ores and metal scrap	Crude materials, inedible	Fresh food
Animals, live, zoo animals, dogs, cats, etc.	Iron and steel	Wood products
Non-metallic mineral manufactures, n.e.s.	Beverages	Processed food

Notes: All sources utilise SITC data provided by the Canadian world trade analyzer. Differences arise from alternative measures used, aggregation procedures and different years analysed.

A problem with this measure is that the indicator is static and does not take into consideration changes in RCA over time. Valentine and Krasnik (2000) extend the static use of RCA measures and interpret growth in RCA as reflecting a countries changing competitiveness in particular commodities. Thus, commodities with rising RCA measures are those that are becoming increasingly competitive. Using this approach they find that for many of the SADC countries it is the relatively high technology sectors that are revealed to be 'dynamically' competitive between 1986-95.

In a further attempt to identify sectors that offer the greatest export potential, Valentine and Krasnik (2000) create a composite RCA indicator calculated as the weighted sum of the static

RCA value, the natural log of the RCA growth rate, and the growth in share of world trade. If the latter was positive then this raised the RCA composite indicator as it was interpreted as reflecting a greater export potential. This is an interesting approach to measuring the competitiveness of a sector, although the somewhat arbitrary construction and weighting of the elements within this indicator make it difficult to interpret. The bulk of the top 25 sectors for SADC as a whole can be classified medium technology intensive or resource intensive.[7] However, 7 of the top 25 sectors are high tech sectors.[8] These results contrast starkly with the static RCA results (none of these sectors showed a positive RCA in 1995), but more importantly contradict what we would expect given the natural resource endowments of these economies. Their inclusion partly reflects the strong world growth of these commodities, but may also arise from the strong growth in exports of these commodities from SA into other SADC countries during the 1990s. Some of this is merely re-exports suggesting that the RCA composite indicator may over-exaggerate the potential for export to the rest of the world.

Composite and other indicators of competitiveness

Other measures attempt to capture the multi-faceted dimension of competitiveness by creating a weighted composite index of a number of different variables believed to influence the competitiveness of a country. One such measure is the Trade Performance Index (TPI) developed by the International Trade Centre (GESP, 2001). The composite indicator is a weighted index of a number of country ranking indices falling under two main components: (a) a static snap shot of the country's most recent export performance (the *position*), and (b) *changes* in the export performance which capture major trends over the recent past. The criteria used to create the composite ranking are the position and change of: (a) value of net exports, (b) per capita exports, (c) world market share, (d) the diversification of products, (e) and the diversification of markets. Rankings are based on 184 participants and composite indicators are provided for 13 aggregated commodity groupings. Their results are for SACU as a whole.

Their results are remarkably similar to Valentine and Krasnik (2000) in that the traditional exports feature prominently on the static front, but the non-traditional exports feature prominently in the dynamic indicator. The composite ranking of *position* related indicators give relatively high rankings (out of 184 countries) to transport (9), minerals (9), and basic manufactures (11). Low rankings are evident in textiles (44), electrical components (36) and non-electrical machinery (33). The dynamic or *change* indicator ranks miscellaneous manufacturing (8), transport equipment (15), consumer electronics (18) and chemicals (17) relatively highly. Minerals (64), clothing (63), processed food (54) and wood products (44) are ranked relatively poorly.

As with most composite indicators the choice of what to include and how much weight to give each variable is largely arbitrary, particularly if the rankings differ widely across the variables. Rankings also fail to tell us the magnitude of the competitive advantage, although the GESP (2001) paper includes the values as well as the rankings of the competitiveness variables. The rankings are useful in that they provide a measure of competitiveness relative to other exporters.

[7] Although the data is for SADC, South Africa dominates the results.

[8] Arms of war, electrical machinery & apparatus, chemical materials & products, n.e.s., medicinal & pharmaceutical products, general industrial machinery & equipment, telecommunications & sound recording apparatus, and office machinery & automatic data processing equipment.

Shift-share analyses of South African exports

A final approach to analysing the competitiveness of South African production is to analyse the changing commodity structure of South African exports and imports. The use of this approach is widespread (Bell and Cattaneo, 1997, Tsikata, 1999, IMF, 2000, Edwards, 2001b). By using a variety of classifications, these studies attempt to highlight changes in the composition of South African trade and then infer conclusions regarding competitiveness. As in the RCA analysis, this approach uses post-trade data to derive conclusions regarding competitiveness.

These studies generally point to the paradoxical structure of South African exports. Using a classification of manufactures by factor usage, Tsikata (1999) notes that South Africa has a high share of human capital and technology intensive exports in total manufacturing exports relative to other countries such as China, Indonesia and Korea. The share of unskilled labour intensive exports in total exports is low, "*which suggests that South Africa is failing to make effective use of the comparative advantage that an abundant supply of labor provides*" (Tsikata, 1999: 25).

The paradoxical structure is in part related to the dual structure of trade of South Africa vis-à-vis developed and developing countries. Net trade is positive in natural resource and basic manufactures, but is negative in sophisticated products for middle and high income countries (IMF, 2000). In contrast, net trade is negative in natural resource goods, but positive in sophisticated products for low income countries. Using the Heckscher-Ohlin-Vanek model, the IMF (2000) further show that South Africa is revealed to be capital as opposed to labour abundant relative to high, middle and low income countries. When using a skilled-unskilled categorisation, South Africa is revealed to be unskilled abundant relative to middle and high income countries, but high skilled relative to low income countries.

The paradoxical capital intensity of trade has not diminished since the early 1980s. Levy (1992) and Bell and Cattaneo (1997) find that South Africa shifted towards a more capital intensive export structure during the 1980s and early 1990s. This trend has continued since trade liberalisation accelerated in 1993, but the structural shift towards capital intensive net exports is not due to a rise in capital intensive exports, but rather a decline in ultra-labour intensive exports combined with strong import growth in this sector. Between 1984 – 97 the capital intensive share of total manufacturing exports remained at 58 %, while the ultra-labour intensive share fell from 11.8 to 6.8 % (Edwards, 2001b).

Using a different classification, Tsikata (1999) finds that South Africa has a rapidly declining share of exports using unskilled labour with the share in total exports declining from 55.3 % in 1992 to 20.8 % in 1996. The implied shift towards high skilled exports is supported by Edwards (2001a) who finds a positive relationship between skill intensity of production and export growth between 1993-97. This, however, may be due to a combination of growth off a low base as well as the rapid growth of high skilled exports into SADC in the mid 1990s. Further, using updated data that was unavailable to Tsikata (1999), Lewis (2001) finds that the decline in share of unskilled labour intensive exports is exaggerated and that the share fell from 8.9 % in 1992 to 6.8 % in 1999.[9] This appears to contradict the conclusions reached

[9] The classification system also appears to be different. The motor vehicle sector SIC (3rd edition) 3840 was not allocated in the Tsikata (1999) breakdown, but was presumably allocated to the unskilled labour intensive category in her classification. In the Lewis (2001) breakdown, this appears to have been allocated to the human capital intensive sector.

when analysing the structure of trade in terms of capital-labour ratios and highlights the difficulty in using factor content categories in the analysis of trade flows. The uncertainty in the debate leaves much room for more in-depth research.

Other classifications based on international market share have also been used to measure the changing competitiveness of South African exports (Wood, 1995, Tsikata, 1999, and GESP, 2001). These studies analyse the changing share of South African exports in world exports, which is a more intuitive approach to evaluating the competitiveness of South African exports. Tsikata (1999) decomposes changes in world market share to create a dynamic classification of South African exports. In this approach South African exports are allocated according to their penetration into growing or declining world trade sectors. Rising stars or dynamic/competitive products are those products where the country's share in international trade is rising in a market which is also expanding internationally (the latter is defined as a market with a rising world export shares). "Lost opportunity" products are those where the world share of the country's exports in dynamic world markets are declining. The country's world share of a commodity may also be rising or falling in world markets experiencing declining shares of world trade. The former, referred to as "falling stars", reflect a shift in exports to stagnating world sectors which may limit future export growth. The latter, "retreat" products, reflect a dynamic adjustment of a country's exports away from these stagnating products.

The results indicate that the bulk of South African exports fall within stagnating world product markets. However, competitiveness has been on the rise generally, with a restructuring of the economy towards the rising stars and the more vulnerable falling star categories between 1992-96. The domination of trade in the latter (over 50 %) is still a concern and specialisation in these products may reduce long term export growth.

The GESP (2001) use a more complex approach and decompose the change in world share of South African exports into (a) the changing share of SA exports in foreign imports - competitiveness effect; (b) the changing share of partner countries in world trade - initial specialisation effect; and (c) adjustment in the regional supply of South African exports in response to changes in world demand. They find that the traditional sectors have lost market share while the less traditional (consumer electronics, electronic components, non-electrical machinery have gained). As the same data (although till 1998) to Tsikata (1999) was used, the results are similar.

It is difficult to infer from post-trade data what is causing structural changes in trade flows. There are a number of possible causes giving rise to the high (and possibly increasing) capital intensity of net trade. Firstly, trade liberalisation combined with the entry of large labour intensive countries such as China and India into the world market has increased competition in labour intensive sectors. To what extent this is an influence is unknown, as in-depth analyses of the changing regional composition of trade at a commodity level are scarce. Some evidence that trade liberalisation has raised the capital intensity of trade is provided by Hayter *et al*. (1999) who find that the prices of capital intensive products have risen relative to labour intensive products. However, much more in-depth analysis at the sectoral level on the relationship between relative price changes and export and import performance is required prior to any conclusion on the relationship between trade liberalisation and the capital intensity of trade can be made. There is substantial scope to extend this type of analysis initiated by Bell *et al*. (1999).

Secondly, the ending of sanctions and the re-integration of the South African economy into the world market since 1994 has resulted in significant expansion of exports into the SADC region. As these exports are skill and capital intensive, this growth is expected to have raised the capital and skill intensity of South African trade. Again, however, the lack of an in-depth analysis of the commodity composition of regional trade prevents a conclusive answer.

Finally, a number of developments on the domestic front, suggest that it is not international trade but domestic factors that lie behind the capital intensity of South African trade (Edwards, 2001b). Firstly, a history of past protection and support has created an economic production structure biased towards capital intensive sectors. Secondly, while government support such as the Regional Industrial Development Programme (RIDP) and the Simplified RIDP (for SMMEs) have attempted to promote labour intensive industries (DTI, 1997: 67), massive investment support programmes for large-scale capital-intensive projects have continued. Between 1993-97 the bulk of IDC funds were utilised in the basic metals sector and covered projects such as the Alusaf expansion, Columbus Stainless Steel and Saldahna Steel (DTI, 1997). Thirdly, GEIS support, particularly during its final years, was biased towards capital and intermediate capital intensive sectors. Fourthly, changes in labour legislation, particularly the extension to non-participants of wage agreements arrived at within the bargaining councils, may negatively affect the competitiveness of low wage low productivity labour intensive industries within each industrial sector (Nattrass and Seekings, ??).

2. Analysing the competitiveness of SA exports

In this section of the paper we present two approaches to the analysis of the competitiveness of South African exports. The first is a brief analysis of structural changes in South African exports. The second presents detailed results of a 'dynamic' decomposition of the RCA measure in equation (1).

Structural changes in South African manufacturing trade

While the analysis of structural changes in trade is common, much of the existing analysis has focussed on commodity breakdowns to the neglect of a regional breakdown. As South Africa is a middle income country its trade with developing and developed countries may differ sharply. As a result the aggregation of these regions may give an incorrect view of the changing competitiveness of South African trade. Little focus has also been placed on the restructuring of SA trade in accordance with its regional comparative advantage. A more detailed analysis of the changing commodity composition of regional trade may give some sectoral insight into the changing competitiveness across regions highlighted by Golub (2000).

This section complements other work also currently analysing the regional and commodity structure of South African exports (GESP, 2001). By classifying manufacturing along dimensions similar to Nordas (1996), Tsikata (1999) and Lewis (2001) the results are directly comparable to earlier work. The World Bank studies utilise a factor content classification system for manufacturing drawn originally from Krause (1988). The factor classifications are as follows: Agriculture resource intensive, mineral resource intensive, unskilled labour intensive, technology intensive, and human capital intensive (see the Appendix for details). Regional data will be classified according to the following categories: Rich, rest of SADC (referred to as RSADC) and rest of world (ROW).

Unfortunately, disaggregated commodity data is only available for SACU as a whole, although some Botswana data is available. The analysis that follows thus presents data for SACU and not South Africa. Some of the importance of inter-regional trade patterns between SACU members is thus lost. Further, any classification using aggregated data hides much of the diversity occurring within the sectors. The factor classification analysis in this paper is thus only illustrative of possible changes in the relative use of factors and the competitiveness of various sectors. The insights derived from the aggregate analysis are useful in directing further research on competitiveness at the sub-sectoral level. This comment is also relevant to the analysis of regional trade flows.

The regional and commodity structure of exports

Table 2 presents an intertemporal view of SACU's manufacturing exports by region as well as the value and growth of total SACU exports in current US$. As shown in the table South African exports grew strongly during the 1990s, particularly as it re-entered the international market with the ending of sanctions in the mid 1990s. Since then export performance has been mediocre and has not exceeded growth in world trade. As result the share of South African exports in world trade, which initially rose from 0.25 % in 1990 to a peak of 0.29 % in 1995, has remained constant in recent years.

Table 2: Intertemporal view of SACU's manufacturing exports by region, share total SACU exports

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999[1]
Rich	62.10%	57.15%	52.26%	50.67%	49.11%	48.72%	51.78%	48.74%	48.30%	55.12%	53.44%
RSADC	14.48%	16.12%	18.39%	17.37%	18.88%	19.79%	18.88%	20.02%	18.80%	17.53%	na
ROW	23.42%	26.73%	29.36%	31.95%	32.01%	31.49%	29.35%	31.24%	32.90%	27.35%	46.56%
Total value (US$ bill)	7.13	7.62	8.23	9.45	9.14	10.40	13.37	13.77	14.61	13.74	14.61
Growth	16.22%	6.83%	8.03%	14.74%	-3.21%	13.80%	28.47%	2.99%	6.12%	-5.92%	6.27%
World trade (US$ bill)	2644.9	3019.2	3121.8	3407.5	3488.1	3894.3	4641.0	4878.5	5051.7	4970.9	
Growth	9.00%	14.15%	3.40%	9.15%	2.37%	11.64%	19.18%	5.12%	3.55%	-1.60%	
SA share world trade	0.27%	0.25%	0.26%	0.28%	0.26%	0.27%	0.29%	0.28%	0.29%	0.28%	

Source: South African data is obtained from TIPS and is based on Customs and Excise Harmonised System classification. World data is UNComTrade data as published by Statistics Canada's World Trade Analyser.
Notes: 1. RSADC data for 1999 is included in ROW.

The geographical composition of manufacturing exports indicates a general restructuring of trade from rich countries to RSADC and the rest of the world. While rich countries still dominate, their share declined from 62 % in 1989 to 53 % in 1999. This decline has been driven by a rising importance of exports to RSADC and the ROW, particularly between 1989 and the mid 1990s. Between 1989 and 1994 the share of exports accounted for by RSADC and the ROW rose from 14.48 % to 19.79 % and 23.43 % to 31.49 %, respectively. Interestingly, the rise in share to RSADC appears to be largely a once off increase arising from the re-integration of South Africa into the regional market. The relatively strong growth of exports into RSADC during the early 1990s has not been sustained resulting in a decline in share to 17.53 % in 1998.

Table 3 presents the share distribution of manufacturing exports according to factor usage. Because of the lack of sectoral deflators, nominal data is used to calculate the share structure of trade. This implicitly assumes a common deflator for all products and may over-estimate the importance of natural resource intensive products which have experienced rising prices in

the latter part of the 1990s.

Table 3: Structure of South African exports according to factor usage classification

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Agriculture intensive	19.3%	19.3%	18.9%	17.0%	17.0%	18.3%	19.2%	18.1%	16.1%	17.2%	15.9%
Mineral intensive	17.9%	15.2%	14.9%	13.1%	12.1%	10.2%	10.3%	14.6%	13.7%	12.5%	12.9%
Unskilled labour intensive	12.1%	13.7%	14.4%	17.2%	18.2%	15.5%	15.0%	16.0%	17.0%	18.4%	22.0%
Technology intensive	15.7%	16.8%	17.9%	22.1%	21.8%	24.4%	26.7%	25.0%	26.0%	24.9%	25.3%
Human capital intensive	35.0%	34.9%	33.8%	30.6%	30.9%	31.5%	28.8%	26.5%	27.3%	27.0%	23.9%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Notes: Nominal data is used to calculate the share structure of trade.

Looking at the composition of total South African exports we first note the paradoxical low percentage of unskilled labour intensive exports relative to the technology and human capital intensive exports. Whereas the former accounts for less that 20 % of total exports, the latter categories exceed 50 % of total exports for most years. As Tsikata (1999) notes, this structure starkly contrasts that of many other labour abundant economies. Agricultural and mineral resource intensive exports are also important making up approximately 30 % of total exports and reflect South Africa's natural resource endowment.

It is also evident that the structure of exports has changed over the past decade. In particular the role of unskilled labour intensive and technology intensive exports have risen, while the importance of resource intensive and human capital intensive exports have fallen. This result contrasts sharply with that of Tsikata (1999) who notes a decline in importance of unskilled labour intensive exports, as well as Nordas (1996) who argued that the reintegration of South Africa into the world economy was likely to reinforce dependence on resource intensive industries.

The dual shift towards both technology intensive and unskilled labour intensive products is unexpected, although the rise in importance in the latter has been noted in the competitiveness results of the GESP (2001) study and the 'dynamic' RCA measures of Krasnik and Valentine (2000). Of importance, however, is whether these shifts reflect the restructuring of export production in the face of trade liberalisation (gains from trade effect) or whether they merely reflect a number of domestic policy distortions. A closer look at the commodity composition of regional trade can provide some insight.

The following table presents a breakdown of manufacturing exports by region and factor usage classification. The objective is to highlight whether significant structural differences exist with respect to the composition of regional exports that may explain the relatively low unskilled labour intensity of total exports shown earlier. Apriori we would expect South Africa to export relatively high value added products to developing regions such as RSADC, and low value added products to rich countries. A further interest is to see whether these structural differences (if any) have changed over the past decade as trade liberalisation has taken place.

Table 4: Intertemporal view of SACU's manufacturing exports by region and factor usage classification, share total regional exports

Rich	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999[1]
Agriculture intensive	18.9%	18.7%	19.6%	17.9%	17.1%	17.9%	19.3%	17.8%	15.6%	15.1%	13.3%
Mineral intensive	21.6%	18.9%	18.2%	15.2%	13.8%	11.4%	9.6%	13.2%	11.1%	12.3%	9.3%
Unskilled labour intensive	12.4%	15.2%	15.1%	17.2%	18.4%	17.4%	16.4%	17.9%	19.6%	21.7%	29.3%
Technology intensive	13.6%	16.3%	18.3%	24.1%	23.2%	26.3%	28.2%	24.4%	26.5%	23.5%	24.3%
Human capital intensive	33.5%	31.0%	28.8%	25.6%	27.5%	27.0%	26.5%	26.7%	27.3%	27.4%	23.9%
RSADC											
Agriculture intensive	13.9%	16.0%	19.3%	18.2%	18.1%	16.1%	17.4%	17.2%	16.8%	18.2%	Na
Mineral intensive	15.0%	11.9%	10.1%	10.6%	10.5%	7.5%	7.1%	9.2%	9.4%	8.6%	Na
Unskilled labour intensive	18.1%	18.7%	21.1%	20.7%	21.9%	21.4%	19.6%	21.0%	22.4%	19.4%	Na
Technology intensive	30.8%	32.6%	29.6%	32.0%	31.2%	29.4%	30.0%	33.0%	31.4%	31.1%	Na
Human capital intensive	22.3%	20.9%	20.0%	18.5%	18.4%	25.6%	25.8%	19.6%	20.1%	22.7%	Na
ROW											
Agriculture intensive	23.6%	22.6%	17.6%	15.1%	16.4%	20.4%	20.3%	19.1%	16.5%	20.9%	18.8%
Mineral intensive	9.9%	9.4%	12.0%	11.2%	10.4%	10.2%	13.6%	20.1%	19.9%	15.3%	17.0%
Unskilled labour intensive	7.7%	7.5%	9.0%	15.2%	15.6%	8.9%	9.5%	9.6%	10.1%	11.1%	13.7%
Technology intensive	11.9%	8.6%	9.9%	13.5%	14.1%	18.3%	21.9%	20.7%	22.1%	23.9%	26.4%
Human capital intensive	47.0%	51.9%	51.4%	45.0%	43.4%	42.2%	34.6%	30.4%	31.4%	28.9%	24.0%

Notes: Data obtained from TPS and converted from HS8 to SIC coding. The factor classification mapping was obtained from Tsikata (1999).
Notes: 1. RSADC data for 1999 is included in ROW.

As shown in the table, the structure of trade across regions generally conform to that of SACU as a whole with the dual structure of trade evident in each region. Some differences, such as the relatively greater share of mineral intensive exports and the relatively smaller share of technology intensive exports to rich countries, are evident and are consistent with the forces of comparative advantage. Of interest, however, is the adjustment in export patterns arising from trade liberalisation during the 1990s.

There is some evidence to suggest that changing regional comparative advantage has played a role in the re-structuring of exports. The share of unskilled labour intensive exports to rich countries rose from 12.4 % in 1989 to 21.7 % in 1998, while human capital intensive exports declined from 33.5 % to 27.4 % over the same period. Interestingly, exports of agricultural and mineral resource intensive exports to rich countries declined from a combined 40.5 % in 1989 to 27.4 % in 1998.

Looking at exports to RSADC, one is struck by the relatively constant structure of exports during the last decade. The expected shift towards a more high technology export structure has not emerged, although the growth in exports between 1994-95 appears to have been dominated by human capital intensive exports. The human capital intensive share of exports to RSADC briefly rose to over 25 % during this period. Further the rise in share of unskilled labour intensive exports to RSADC from 1989 contradicts our apriori expectations regarding the re-structuring of exports and suggests that other factors such as domestic policy have played a role.

A closer look at the sectoral level data suggests that this may be the case. The rise in share of unskilled labour intensive exports has been driven by rapid growth in exports of motor vehicles and motor vehicle parts and accessories (grouped into SIC 3rd edition 3840). The replacement of the Phase VI programme with the MIDP program in 1995 which due its import-export trade balance rebate system has boosted both exports and imports of products

from the motor industry (Tsikata, 1999). The effect has been a rise in the share of manufacturing exports accounted for by this sector from 2.24 % in 1989 to 7.18 % in 1998 (14.99 % in 1999). For RSADC countries the share rose from 7.46 % to 8.99 % over the same period.

The regional and commodity structure of imports

Table 5 presents a share breakdown of total imports according to region. Import growth, like export growth was strong after the ending of sanctions, but low during the early 1990s and late 1990s as result of poor economic growth during these periods. Over 70 % of imports are made up of intermediate and capital goods, implying a close relationship between output growth and import growth. Substantial depreciations in the currency in 1996 also help depress import growth.

As shown, the bulk of imports are sourced from rich countries, although the share accounted for by labour intensive countries such as China and India has risen over the last decade. Between 1988-1998 the share of total South African manufacturing imports purchased from China and India rose from 0.79 % to 4.5 %. The share of imports sourced from RSADC has also more than doubled, but remains less than 1 % of total imports. The effect is a widening trade imbalance with the region as a whole.

Table 5: Intertemporal view of SACU's manufacturing imports and net trade ratio by region.

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Rich	85.02%	84.84%	82.48%	79.81%	79.54%	79.57%	79.46%	77.69%	76.76%	77.17%	71.98%
RSADC	0.29%	0.26%	0.27%	0.38%	0.46%	0.45%	0.40%	0.38%	0.55%	0.63%	0.00%
China &India	0.79%	0.96%	1.25%	1.67%	2.20%	2.40%	2.81%	3.43%	4.23%	4.50%	4.99%
ROW	13.90%	13.94%	16.00%	18.14%	17.81%	17.58%	17.33%	18.50%	18.46%	17.70%	23.03%
Total value (US$ Billl)	13.53	13.43	14.11	15.38	15.43	19.00	23.85	23.69	23.79	23.83	21.35
Growth	0.57%	-0.75%	5.08%	9.01%	0.27%	23.15%	25.55%	-0.67%	0.40%	0.16%	-10.39%
SA share world trade	0.51%	0.44%	0.45%	0.45%	0.44%	0.49%	0.51%	0.49%	0.47%	0.48%	
Net trade ratio (X-M)/(X+M)											
World	-0.31	-0.28	-0.26	-0.24	-0.26	-0.29	-0.28	-0.27	-0.24	-0.27	-0.19
Rich	-0.44	-0.45	-0.46	-0.44	-0.46	-0.50	-0.47	-0.47	-0.44	-0.42	-0.33
RSADC	0.93	0.94	0.95	0.93	0.92	0.92	0.93	0.94	0.91	0.88	
ROW	-0.09	0.01	0.00	-0.01	-0.03	-0.07	-0.10	-0.09	-0.06	-0.17	0.06

Notes: China and India are included as it is widely believed that the integration of these economies into the world market has substantially altered the relative competitiveness of middle income countries such as South Africa.

The structure of trade according to factor content is presented in Table 6. Unlike the structure of exports the aggregate structure of imports has remained relatively constant over time. The structure of imports is biased towards high technology products suggesting that South Africa behaves as a developing country in relation to the import market. Unskilled labour imports are also high, but have not risen dramatically over the past decade. Although trade liberalisation may have raised international competition in unskilled labour intensive sectors, this has not resulted in enormous increases in imports of these products. The share of unskilled labour intensive products in total imports actually declined from 27.1 % in 1993 to 24.4 % in 1998.[10]

[10] There may still have been an impact on both wages and output. Firms may have had to reduce wages and increase productivity in order to compete

Table 6: Structure of South African imports according to factor usage classification

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Agriculture intensive	7.4%	7.5%	7.2%	8.3%	7.4%	8.6%	8.6%	8.1%	8.7%	7.7%	7.6%
Mineral intensive	3.1%	3.2%	3.1%	3.3%	3.2%	2.8%	3.8%	4.5%	3.9%	4.4%	4.6%
Unskilled labour intensive	28.0%	27.0%	26.9%	25.9%	27.9%	27.1%	27.5%	27.6%	25.5%	24.3%	27.1%
Technology intensive	46.9%	47.5%	49.0%	48.5%	47.1%	45.9%	44.7%	43.2%	44.4%	42.6%	42.0%
Human capital intensive	14.6%	14.8%	13.8%	14.1%	14.4%	15.5%	15.5%	16.6%	17.5%	21.0%	18.7%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Looking at the commodity structure of regional trade presented in Table 7, shows that imports are sharply defined along regional lines, a result not found in the analysis of exports. Imports from rich countries largely fall within the technology and human capital intensive sectors, although labour intensive imports are also very high. In contrast, imports from RSADC are largely agricultural resource intensive. As expected, imports from China and India are dominated by unskilled labour intensive products which exceeded 50 % during the early 1990s.

Table 7: Intertemporal view of SACU's manufacturing imports by region and factor usage classification, share total regional imports

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Rich											
Agriculture intensive	5.0%	5.5%	5.2%	6.1%	5.7%	6.3%	6.4%	6.0%	6.4%	5.7%	5.8%
Mineral intensive	3.0%	3.0%	3.0%	3.0%	3.1%	2.7%	3.6%	3.6%	3.5%	3.5%	3.7%
Unskilled labour intensive	27.8%	26.1%	25.2%	25.0%	27.1%	26.5%	27.4%	27.4%	24.3%	23.1%	27.3%
Technology intensive	50.1%	50.8%	53.4%	52.1%	50.0%	49.3%	47.4%	46.6%	48.0%	46.0%	45.0%
Human capital intensive	14.1%	14.5%	13.1%	13.8%	14.0%	15.2%	15.3%	16.4%	17.8%	21.7%	18.2%
RSADC											
Agriculture intensive	30.7%	43.0%	54.5%	52.1%	44.4%	24.9%	18.3%	21.2%	20.7%	17.0%	
Mineral intensive	39.0%	21.3%	11.8%	7.9%	7.4%	17.0%	13.2%	9.1%	8.1%	10.9%	
Unskilled labour intensive	19.8%	24.4%	21.8%	24.1%	23.5%	41.2%	43.1%	52.8%	48.2%	48.4%	
Technology intensive	7.3%	3.3%	4.8%	6.7%	7.7%	7.7%	8.3%	8.3%	16.7%	18.4%	
Human capital intensive	3.1%	8.1%	7.1%	9.2%	17.1%	9.2%	17.1%	8.7%	6.3%	5.2%	
China & India											
Agriculture intensive	7.3%	8.1%	8.4%	16.9%	10.5%	12.4%	13.4%	12.4%	14.2%	11.6%	11.1%
Mineral intensive	17.6%	16.5%	9.5%	9.4%	7.1%	6.0%	5.7%	6.0%	6.3%	7.7%	6.7%
Unskilled labour intensive	56.5%	52.9%	60.1%	51.2%	54.0%	48.4%	43.1%	40.8%	39.2%	35.9%	35.4%
Technology intensive	10.3%	10.4%	8.4%	11.6%	15.0%	17.4%	22.9%	25.0%	25.8%	29.0%	30.4%
Human capital intensive	8.3%	12.1%	13.6%	10.9%	13.4%	15.8%	14.8%	15.8%	14.6%	15.8%	16.5%
Row											
Agriculture intensive	21.1%	18.6%	16.6%	16.3%	13.4%	18.4%	17.7%	15.9%	16.7%	14.8%	12.7%
Mineral intensive	2.7%	2.8%	2.8%	3.5%	2.8%	2.4%	4.3%	8.2%	4.9%	7.5%	7.2%
Unskilled labour intensive	28.1%	31.0%	32.6%	27.5%	28.6%	26.7%	24.7%	25.6%	26.7%	25.9%	24.4%
Technology intensive	29.9%	30.9%	30.1%	37.1%	39.0%	35.2%	36.8%	32.8%	34.5%	32.3%	35.0%
Human capital intensive	18.3%	16.8%	17.8%	15.6%	16.1%	17.3%	16.4%	17.4%	17.2%	19.5%	20.7%

Sharp shifts in the structure of imports have also occurred since the ending of sanctions and the acceleration of trade liberalisation in 1993. Imports of human capital intensive products from rich countries and the rest of the world have risen reflecting the declining competitiveness of many of the knowledge intensive industries in South Africa. Changes in the structure of demand towards more high tech automation equipment, the expansion and digitalisation of the telecommunications networks, the building of the cellular phone network infrastructure and the recapitalisation of many industries during the 1990s have also raised

imports of human capital and technology intensive products (Edwards, 2000). Substantial restructuring of imports from RSADC has also occurred with the share of unskilled labour intensive imports rising from 23.5 % in 1993 to 48.2 % between 1993-98. During the same period the share of agricultural resource intensive imports fell from 44.4 % to 17 %. While the growth of unskilled labour intensive imports from RSADC reflects the significant positive impacts South Africa can have on the development of the region, the very small share of imports sourced from RSADC highlights the extent of further possible gains.

The structure of trade with China and India has also changed significantly since trade liberalisation and the ending of sanctions in 1993/94. Although unskilled labour intensive imports continue to dominate its importance has declined (share fell from 54 % in 1993 to 35.9 % in 1998) as technology and human capital intensive imports have grown. In 1989 these two categories only accounted for 18.6 % of total imports from the region. By 1998 they accounted for 44.8 %. These trends may signal relative declines in South African competitiveness vis-à-vis these countries in the production of high technology products. The results also suggest that the difficulties experienced in many labour intensive industries such as the clothing and textile sectors may not be a direct result of trade with these countries.

SACU share of world trade

The above analysis presented a picture of the changing structure of South African exports and imports. While inferences are made with respect to the changing competitiveness of South African production, these fail to consider the changing dynamics of world trade. A more informative approach is to analyse the changing shares of South African exports and imports in world exports and imports. For example, a rise in share of South African exports of a particular commodity does not necessarily indicate a rise in competitiveness as the share of this commodity in world trade may have increased at a faster rate. In this case South Africa is lagging world competitiveness. In this section the share of SACU exports and imports in world trade is presented according to factor usage classification (Table 8). These results also serve as an introductory insight into the dynamic analysis that follows.

Table 8: Intertemporal view of SACU's manufacturing exports as share of world exports by factor usage classification

	1990	1994	1998
Exports			
Agriculture intensive	0.48%	0.48%	0.52%
Mineral intensive	0.32%	0.34%	0.44%
Unskilled labour intensive	0.13%	0.15%	0.19%
Technology intensive	0.13%	0.19%	0.19%
Human capital intensive	0.52%	0.44%	0.38%
Total	0.25%	0.27%	0.28%
Imports			
Agriculture intensive	0.33%	0.42%	0.40%
Mineral intensive	0.12%	0.17%	0.27%
Unskilled labour intensive	0.44%	0.47%	0.43%
Technology intensive	0.63%	0.65%	0.56%
Human capital intensive	0.39%	0.39%	0.52%
Total	0.44%	0.49%	0.48%

Source: South African data is obtained from TIPS and is based on Customs and Excise Harmonised System classification. World data is UNComTrade data as published by Statistics Canada's World Trade Analyser. World trade is balanced implying exports equal imports.

The results from this approach present a different picture from the simple share structure analysis of exports and imports. Although the share of agricultural and mineral intensive products in SACU exports declined since 1990 (see Table 3) export growth still exceeded world export growth. As a result the share of SACU exports in agriculture and mineral intensive products in world trade rose from 0.48 % and 0.32 % to 0.52 % and 0.44 % between 1990-98, respectively. The trends in world shares of the remaining classifications are consistent with the changing share structure of SACU exports presented in Table 3. These results indicate that when compared to world trade the shift towards more high skilled and capital intensive exports discussed by Bell and Cattaneo (1997) and Tsikata (1999) may be over exaggerated. South African exports have become more concentrated in natural resource intensive products

On the import side the trends in world share are similar to the changing structure of SACU imports. Significant increases in world share of mineral intensive and human capital intensive products occurred between 1994-98. These are largely driven by rising petroleum imports as well as the importation of TV, radio and communication equipment to supply the burgeoning cellular phone industry.[11]

The 'dynamic' competitiveness of South African exports

As discussed earlier a common indicator of competitiveness is the RCA measure presented in equation (1). The measure provides insight into the static competitiveness of commodities through a comparison of the share of the commodity in domestic exports with that of world as a whole. The indicator is, however, less suitable for the analysis of changing competitiveness over time. As result various attempts have been made to either create composite or 'dynamic' RCA indicators (Valentine and Krasnik, 2000), or to decompose changes in domestic share of world trade (Tsikata, 1999, and GESP, 2001).

As with all competitiveness measures, there are serious shortcomings in each of these. The approach within this paper is derived from the attempt by Valentine and Krasnik (2000) to create a 'dynamic' RCA indicator of competitiveness. In their approach commodities with rising RCA measures are interpreted as those that are becoming increasingly competitive. A number of problems are evident in the Valentine and Krasnik (2000) study. Firstly, their analysis combines both static and change variables in deriving their composite competitiveness index for commodities. Interpretation of their results is, thus, difficult. Secondly, RCA measures can be influenced by changes in both the numerator and denominator of the RCA measure. By only focussing on the change in the RCA indicator, but not the forces driving this change, a lot of important information is lost. For example, South Africa may be specialising in a particular commodity '*i*' (rising numerator) that is diminishing in importance in international trade (falling denominator). The dynamic RCA indicator will 'reveal' this as an increasingly competitive commodity. However, from a longer term more dynamic perspective South Africa is specialising in a declining industry – a 'falling star' according to Tsikata (1999). Similarly, a rising RCA will also be 'revealed' for commodity '*k*' if its share in South African exports is rising faster than its share in world exports. This is similar to what Tsikata (1999) refers to as a 'shooting star' and reflects rising competitiveness in a growing market. Without decomposing growth of the RCA measure into its constituent shares, it is not possible to differentiate the 'shooting stars' from the 'falling stars'.

[11] The share of TV, radio and communication equipment in total trade rose from 3.45 % to 11.47 % between 1990-98.

By taking the logs of equation (1) and then totally differentiating, growth in RCA can be decomposed into the following:

$$\frac{\Delta RCA_j}{RCA_j} = \frac{\Delta\left(X_{i.j} \Big/ \sum_j X_{i.j} \right)}{X_{i.j} \Big/ \sum_j X_{i.j}} - \frac{\Delta\left(X_{w.j} \Big/ \sum_j X_{w.j} \right)}{X_{w.j} \Big/ \sum_j X_{w.j}} \qquad (2)$$

The first term on the RHS reflects the growth in share of commodity *j* in total South African trade while the second term reflects the growth in share of commodity *j* in world trade.[12] The following scenarios are possible.

Table 9: Market position of exports

	Share *j* in SA exports		Share *j* in world exports	
Increasing RCA	-	>	-	Rising stars
	-		−	Falling stars
	−	>	−	Lagging retreat
Decreasing RCA	−		-	Lost opportunity
	−	<	−	Leading retreat
	-	<	-	Lagging opportunity

This approach is a variant of the work by Tsikata (1999) who uses a similar categorisation, but allocates South African exports according to their penetration into growing or declining world trade sectors. The results differ in the following respects. Firstly, the methodology provides insight into the competitiveness of South African exports using the standard RCA measures. Secondly, Tsikata's (1999) analysis only extends to 1996, while this project extends the analysis to 1998. Thirdly, the paper provides insight into the regional and commodity composition of these categories. It is recognised that strong exports to RSADC have helped raise export growth since 1994. It is not known how this has affected the competitiveness of South African exports from the dynamic perspective incorporated in the approach set out above.

Data

Again, data was only available for SACU as a whole. Trade data for SACU and the world are drawn from Customs and Excise 8-digit Harmonised System (HS) data and UNComTrade SITC data as reported by Statistics Canada's World Trade Analyser, respectively. HS data was used for SACU as it (a) is available up to 1999 as opposed to 1998 for the SITC data, (b) HS manufacturing data to RSADC countries is available prior to 1992 while the UNComTrade data prior is unreliable as SACU did not report data between 1974-1991, and (c) data was missing for a number of SITC categories and would have to have been found from alternative sources.

In the calculation of the RCA values, world trade data first had to be converted into SIC 3rd edition categories. Concordance files obtained from Jon Haveman (http://www.eiit.org/) were used, although adjustments had to be made at times. The SIC and HS 8 digit concordance and

[12] Note that equation 2 can be decomposed further. For the purpose of this study this level of decomposition is adequate.

name file were utilised to ensure consistency in cases which were unclear. Further, the SIC category share breakdown using the SITC data was compared to that of the HS converted data. All cases exceeding a 2 percentage point difference were re-analysed and changes were made when concordance errors were found. Finally, RCA measures were compared using the SITC and HS derived SIC category data. Any RCA measures revealing opposite comparative advantages were re-checked. Only 3 errors remained, but as these sectors account for less than 1 % of total exports, they are not expected to influence the analysis substantially.

Some further changes were made to the SIC concordance files. The HS 7101 to 7112 and the equivalent SITC data were re-allocated from jewellery (SIC 3902) to mining (SIC 2) as these contained products such as gold, diamonds, uranium, platinum and others. Much of this data was not available prior to 1995 and in cases where it was the regional destinations were not provided. Data falling under HS 2710 petroleum products and initially allocated to SIC 3530 were deleted as the data was highly irregular and was missing for various years.

Static RCA measurements

The results for the static RCA measurements are presented in Table 10 that shows the share structure of regional exports according to factor usage and RCA.

Table 10: Share structure of regional exports according to factor usage classification and RCA

	1992				1998			
	Total	**Rich**	**RSADC**	**ROW**	**Total**	**Rich**	**RSADC**	**ROW**
Revealed comparative advantage								
Agriculture intensive	0.215	0.230	0.289	0.168	0.223	0.198	0.259	0.254
Mineral intensive	0.173	0.194	0.190	0.137	0.167	0.160	0.138	0.193
Unskilled labour intensive	0.091	0.088	0.102	0.091	0.069	0.095	0.065	0.021
Technology intensive	0.141	0.185	0.172	0.067	0.220	0.210	0.294	0.206
Human capital intensive	0.379	0.303	0.246	0.537	0.321	0.337	0.244	0.326
Share regional trade %	**70.74**	**73.45**	**48.33**	**78.61**	**70.21**	**72.41**	**53.30**	**76.60**
Revealed comparative disadvantage								
Agriculture intensive	0.063	0.039	0.083	0.087	0.053	0.026	0.094	0.062
Mineral intensive	0.030	0.035	0.027	0.022	0.026	0.029	0.027	0.020
Unskilled labour intensive	0.363	0.399	0.304	0.369	0.452	0.534	0.338	0.403
Technology intensive	0.415	0.400	0.458	0.387	0.319	0.301	0.332	0.346
Human capital intensive	0.130	0.128	0.128	0.135	0.150	0.110	0.209	0.169
Share regional trade %	**29.26**	**26.55**	**51.67**	**21.39**	**29.79**	**27.59**	**46.70**	**23.40**

The results of the static RCA analysis are similar to those of Edwards *et al*. (2000) and Valentine and Krasnik (2000). SACU is revealed to have a comparative advantage in natural resource intensive products and a disadvantage in some of the higher value added categories such as TV, radio & communication equipment and optical & photographic equipment. Although the share of human capital intensive products is high, this is largely due to the iron & steel industry which accounted for 24.4 % and 18.8 % of total South African trade in 1992 and 1998, respectively. Looking at sectors with a comparative disadvantage, we note a high percentage (over 40 %) of technology intensive products falling within this category. The share of this sector has, however, declined during the 1990s with unskilled labour intensive products taking over as the largest single constituent of exports revealed to have a comparative disadvantage. Not shown is the overlap between the static and dynamic RCA commodities which is limited. Much of the growth in RCA occurs outside the standard sectors that are revealed to have a static comparative advantage (see the Appendix for the

table on the top 10 and lowest 10 static RCA commodities). This re-affirms some of the results of Valentine and Krasnik (2000) and GESP (2001).

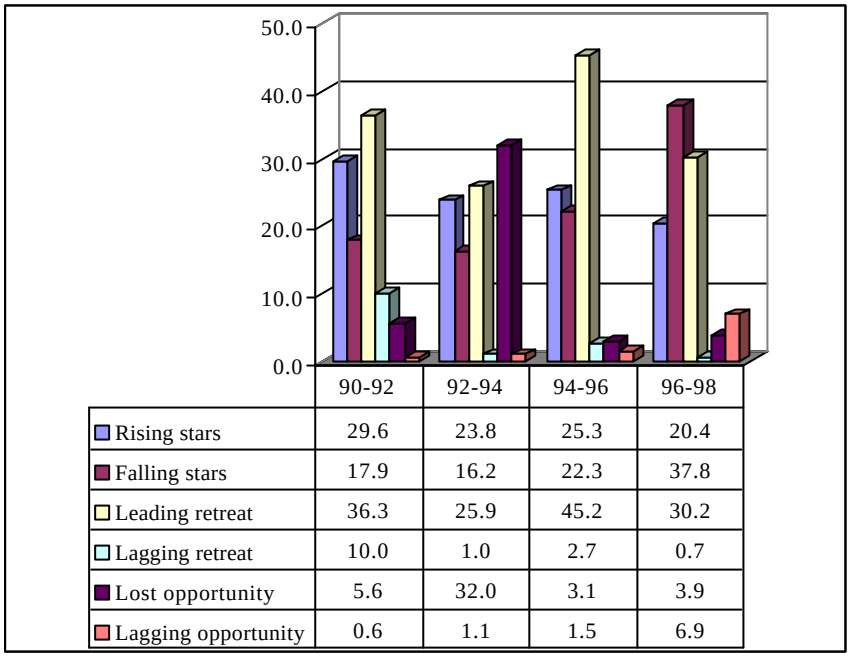
As shown in Table 10 exports in commodities with a RCA dominate manufacturing exports to all regions, but to RSADC. Over 70 % of exports with rich countries and the rest of the world fall within sectors revealed to have a comparative advantage. For RSADC the share lies between 48.33 % and 53.3 %. As result a high percentage of exports to RSADC is of commodities revealed to have a comparative disadvantage. This contrast may merely reflect the difficulties in using country aggregated trade data to identify competitiveness vis-à-vis the rest of the world when substantial diversity in competitiveness exists at an individual country level. The large volumes of trade with rich countries will bias the RCA measure used in equation (1) towards identifying those sectors that are competitive vis-à-vis rich countries. Competitiveness vis-à-vis smaller countries may differ.

It may also reflect dynamic adjustments to the structure of trade. A look at the composition of trade indicates that technology intensive and increasingly human capital intensive products account for relatively high percentages of RSADC trade in products revealed to have a comparative disadvantage. From a dynamic perspective this could reflect the use of regional trade as a platform for the development of non-traditional export industries in which South Africa has a regional comparative advantage. Alternatively, trade with RSADC creates opportunities for the re-direction of high technology exports from competitive rich country markets to regional markets where competition is less fierce. The following section attempts to shed some light on this matter.

Dynamic analysis: World market positioning

Figure 2 shows South Africa's market positioning from 1990 to 1998 according to the classifications in Table 9. Although the classifications have been extended by two additional categories (breakdown of "retreat" and "lost opportunity"), the results seem to confirm trends, which Tsikata (1999) identified in her earlier analysis for 1992 to 1996.

Figure 2: Intertemporal view of South Africa's world market positioning, classifications as % share of manufacturing export to world



	90-92	92-94	94-96	96-98
Rising stars	29.6	23.8	25.3	20.4
Falling stars	17.9	16.2	22.3	37.8
Leading retreat	36.3	25.9	45.2	30.2
Lagging retreat	10.0	1.0	2.7	0.7
Lost opportunity	5.6	32.0	3.1	3.9
Lagging opportunity	0.6	1.1	1.5	6.9

Notes: Export shares are calculated using the final year data in each period.

Looking first at the total structure of exports from a static perspective we find that the bulk of SA exports fall within markets which are declining in terms of share in world trade (falling stars and the retreat categories). In 1992 64.2 % of total South African exports fell within declining world markets. By 1998 this had risen to 68.7 % and reflects the high share of agriculture and mineral resource intensive products in South African exports identified in the RCA analysis. As a combined share of world manufacturing trade, these two categories declined from 22.3 % to 16.9 % between 1990-98.

We first look at the leading retreat classification which symbolises the rapid restructuring of South Africa's exports out of declining stagnating/decreasing world markets. From a dynamic perspective evidence of successful restructuring would be reflected in high shares of trade falling within the leading retreat and rising star categories. This would indicate that exports are rapidly moving out of stagnating markets and into dynamic markets. As shown in Figure 2, SACU has been relatively successful in moving out of stagnating markets, with 25.9 % and 45.2 % of total exports falling within the leading retreat category. Much of this has been due to the declining share of iron & steel in South African exports, particularly during 1990-92 and 1994-96. Lagging retreats have been less important and seem to generally show a declining trend. Hence, one can say that South Africa has restructured quickly out of unsustainable markets.

Unfortunately most of the restructuring has occurred into markets, which are not dynamically competitive. As the rising stars category shows, South Africa has continuously decreased its market share of growing world markets, in which it has a competitive edge. The share of rising stars of total export fell from almost 30 % to only 20 % between 1990-98. More worrying is the increase of falling stars from 17.9 % to 37.8 % of total exports.[13] South Africa

[13] The significant rise from 1994-96 to 1996-98 is partially explained by the shift of iron & steel from the leading

has doubled its market share of stagnant/decreasing world markets, in which it has a competitive edge. In the long run these markets may not be sustainable and hence will leave South Africa behind other countries that have improved their share of rising star markets. On a positive note, South Africa has been improving its share of lagging opportunities, i.e., growing world markets, in which South Africa could also increase its competitiveness.

The least desirable classification is lost opportunity. Except for the period between 1992-94, South Africa has been fairly consistent in keeping lost opportunities relatively low. The high percentage of lost opportunities in 1992-1994 was caused by a slight increase in share of world trade of SIC commodity 3710 (iron and steel**)** while this commodity continued to fall as a share of South Africa's exports.

Overall, the picture is mixed with both positive and negative developments. In the following sub-sectors a closer look at the geographical and commodity structure of the world market positioning is presented.

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retreat category to the falling star category as result of a slight increase in domestic market share. The removal of this product from the data reduces the downward trend in rising stars, increases the upward trend in leading retreats, and stabilises the share of falling stars.

Commodity breakdown of market positioning

The following table presents the commodity breakdown of the top 10 and lowest 10 growth in RCA values for 2-year intervals between 1990-98. Also presented are the market positioning categories of each commodity.

Table 11: Commodity breakdown of marketing positioning

Rank	1990-92		1992-94		1994-96		1996-98	
	Top 10							
1	Footwear	RS	Sugar factories & refineries	FS	Paper & paperboard, nec	FS	Ship building & repairing	RS
2	Man-made fibres	FS	Distilleries & wineries	RS	Musical instruments	FS	Petroleum refineries	FS
3	Ship building & repairing	FS	Musical instruments	FS	Distilleries & wineries	RS	Products of leather	FS
4	Leather tanning & dressing	FS	Printing & publishing	FS	Coke oven products	FS	Tobacco products	FS
5	Aircraft & spacecraft	RS	Wooden containers	FS	Railroad equipment	FS	Aircraft & spacecraft	RS
6	Products of leather	RS	Paper packaging	RS	Structural metal products	RS	TV, radio & communication	RS
7	Wooden containers	RS	Soap, perfumes & other toilet preparations	RS	Sugar factories & refineries	RS	Cement, lime & plaster	FS
8	Coke oven products	FS	Aircraft & spacecraft	FS	Clocks & watches	FS	Other chemicals nec	FS
9	Wearing apparel	RS	Furniture, excl metal	RS	Electrical apparatus nec	RS	Motor cycles & bicycles	FS
10	Distilleries & wineries	FS	Coke oven products	FS	Machinery & equipment nec	FS	Machinery & equipment nec	FS
	Bottom 10							
70	Paints, varnishes & lacquers	LO	Man-made fibres	LO	Jewellery	LR	Clocks & watches	LR
71	Articles of fur	LR	Meat products	LR	Motor cycles & bicycles	LR	Paper packaging	LR
72	Printing & publishing	LO	Structural clay products	LO	Prepared animal feeds	LO	Footwear	LR
73	Medicinal & pharmaceutical	LO	Textile preparation & spinning	LR	Cement, lime & plaster	LR	Structural metal products	LR
74	Jewellery	LO	Pottery, china & earthenware	LR	Soap, perfumes & other toilet preparations	LR	Distilleries & wineries	LR
75	Musical instruments	LR	Soft drinks	LO	Petroleum refineries/synthesisers	LO	Malt liquors & malt	LR
76	Metal products nec	LO	Non-ferrous metals	LR	Wood products, nec	LR	Jewellery	LO
77	Sawmilling & planting of wood	LR	Wearing apparel, excl footwear	LR	Paper packaging	LO	Cordage, rope & twine	LR
78	Prepared animal feeds	LO	Vegetable & animal oils & fats	LO	Aircraft & spacecraft	LR	Paper & paperboard, nec	LR
79	Sugar factories & refineries	LR	Ship building & repairing	LR	Articles of fur	LO	Musical instruments	LR

Notes: RS, FS, LO and LR stand for rising star, falling star, lost opportunity and leading retreat, respectively.

A striking feature in Table 11 is the volatility of RCA growth rates. Many commodities fall in the top 10 in one period and then drop to the bottom 10 in the subsequent period. This is most noticeable when comparing 1994-96 and 1996-98 where 4 of the top 10 drop to the bottom 10 and 4 of the bottom 10 rise to the top 10. This high level of volatility arises from the very small base values in the denominators of equation 2 and the disaggregated level at which RCA growth rates were calculated. The greater the disaggregation the more susceptible the share of trade is to once off changes in export sales. This volatility indicates that care must be taken when interpreting the results in this analysis.

No clear structure according to factor usage is evident from Table 11. Some commodities such as aircraft and spacecraft, distilleries and wineries, building and repairing of ships appear regularly in the top 10, but these do not consistently fall in any single factor usage category. Most of these commodities are not natural resource intensive suggesting that much of the action is occurring outside the traditional export sectors. The main insight presented in Table 11 is the shift in growing RCAs towards falling stars (FS) and the increasing importance of

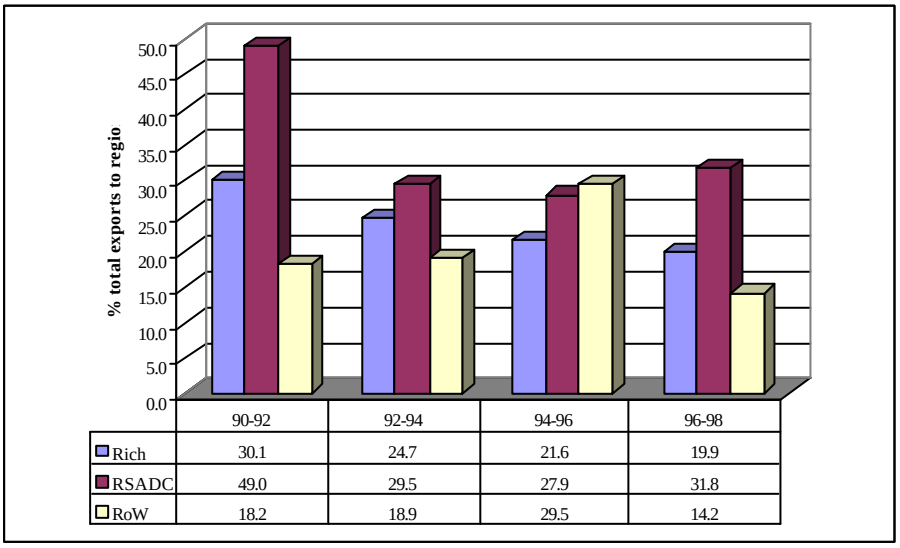
leading retreats (LR) in declining RCAs. In 1992 half of the top 10 rising RCA commodities were falling stars. By 1998 this had risen to 7.

The changing composition of rising RCAs highlights the difficulty in interpreting these, as is done in Valentine and Krasnik (2000), as indicators of long term dynamic competitiveness. Declining RCAs are also not necessarily an indicator of poor dynamic competitiveness. This is evident in the rising importance of leading retreats in the bottom 10 RCA growth products. The number of leading retreats in the bottom 10 RCA growth products rose from 4 in 1990-92 to 9 between 1996-98 and reflects a positive adjustment out of stagnating markets. These trends are also evident over a longer time frame (1990-94 & 1994-98) where RCA growth values are less susceptible to the volatility displayed in Table 11. [14]

Geographical Market Positioning

The world market positioning was broken down into trade with three regions: Rich, RSADC, and rest of world (RoW). The aim was to see if trade with particular regions has had a significant impact on South Africa's market positioning. Because of their relative importance only rising stars, falling stars and leading retreat classifications will be dealt with. More information on the factor usage classification of exports according to region is provided in the Appendix tables. Further, this analysis is only illustrative and more disaggregated regional breakdowns would be required for an analysis of the country specific changes that may exist.[15]

Figure 3: Intertemporal view of SACU's regional market positioning for rising stars, % regional total



	90-92	92-94	94-96	96-98
Rich	30.1	24.7	21.6	19.9
RSADC	49.0	29.5	27.9	31.8
RoW	18.2	18.9	29.5	14.2

[14] When using 1990-94 and 1994-98 time frames the number of falling stars in the top 10 growing RCA commodities rose from 2 to 8. The number of leading retreats rose from 4 to 8.

[15] There is a more fundamental criticism of the regional breakdown of market positioning. The overall market positioning of each sector is determined by changing sectoral shares of total SACU trade relative to world trade according to Table 9. Because the volume of exports to regions affects the classification according to market positioning, the classifications will be biased towards large country trade flows. Thus a low share of rising stars to RSADC does not necessarily reflect a failure of SACU to exploit market opportunities in these regions, as the composition of import demand from RSADC may not correspond with world market demand. A better approach would be to deal with import demand by each region separately, and to analyse whether SACU has managed to expand its exports into those markets characterised by increasing import demand.

Figure 3 shows the percentage share rising stars in total manufacturing exports according to geographical region. Rising stars as a share of total trade to rich countries has consistently declined from 30.1 % to 19.9 % between 1990-98. On the other hand, after an initial fall from almost 50 % in 1990-92 to 29.5 % in 1992-1994, rising stars have been a constant share of almost 30 % of exports to RSADC. The relatively larger and more stable (after 1992) share of rising stars in total exports to RSADC suggests that trade with RSADC has been a relatively important market through which SACU is restructuring exports into sustainable competitive markets. Given South Africa's proximity to RSADC and its regional comparative advantage in non-resource intensive products, export growth to RSADC may provide a platform for the emergence of dynamic high value added production sectors.

A look at the commodity breakdown for rising stars according to region in Table 12 provides some support for this view.

Table 12: Intertemporal view of the commodity breakdown for rising stars according to region, % regional total

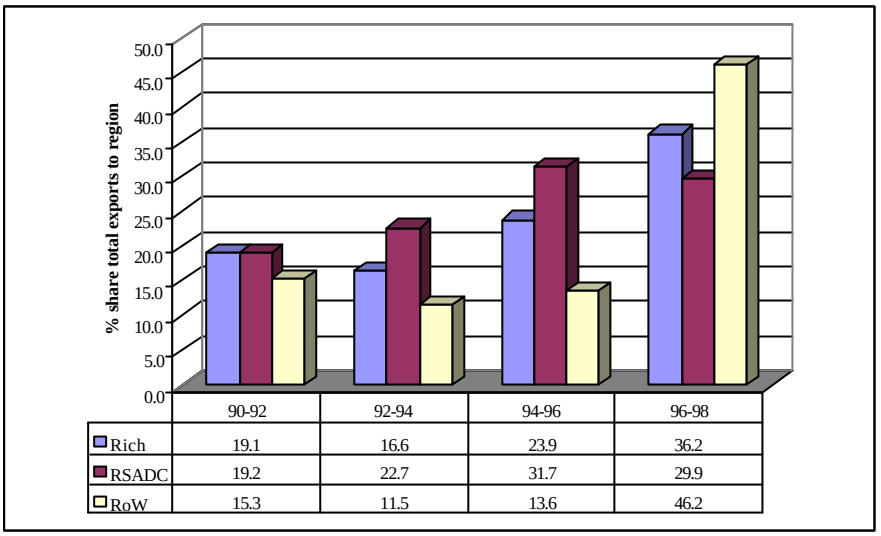
	1990-92	1992-94	1994-96	1996-98
Rich				
Agriculture intensive	22.1	10.9	20.1	0.0
Mineral intensive	3.0	0.0	52.8	0.0
Unskilled labour intensive	35.2	17.0	1.1	60.7
Technology intensive	25.6	64.2	17.3	31.0
Human capital intensive	14.0	7.9	8.8	8.3
RSADC				
Agriculture intensive	25.9	3.8	15.5	0.0
Mineral intensive	2.5	2.0	25.4	0.0
Unskilled labour intensive	30.1	9.3	4.3	48.2
Technology intensive	29.3	43.9	42.9	25.0
Human capital intensive	12.2	41.1	11.9	26.8

While all regions show similar trends in the commodity breakdown of rising star exports, a difference in levels exists with the combined share of human capital and technology intensive products in total trade relatively high to RSADC compared to rich countries.

Also evident in Table 12 is the lack of an obvious trend in the commodity structure of South Africa's rising stars. This may reflect the volatility in domestic and world trade, but also reveals a failure of the economy to consistently shift into growing world markets. In world trade the bulk of commodities experiencing rising shares fell within the technology and human capital intensive sectors. From a long-term dynamic perspective it is important that the structure of South African exports mimics this process.

Turning to falling stars, Figure 4 presents the percentage share falling stars in total manufacturing exports according to geographical region.

Figure 4: Intertemporal view of SACU's regional market positioning for falling stars, % regional exports



A more consistent trend than in the case of rising stars is indicated with the share of falling stars in total export to each region rising for all regions. SACU has almost doubled its share of falling star exports to rich countries from 19.1 % in 1990-92 to 36.2 % in 1996-98. The share of falling star exports to RSADC has shown a similar trend increasing from 19.1 % in 1990-1992 to 29.9 % in 1996-98. The trade to the Rest of the World has, after being relatively stable around 13 % in the first 6 years, increased dramatically to 46.2 % in 1996-98.

The changing commodity composition falling stars (Table 13) is similarly consistent. Because the trends across regions are similar the commodity breakdown of total falling stars is presented.

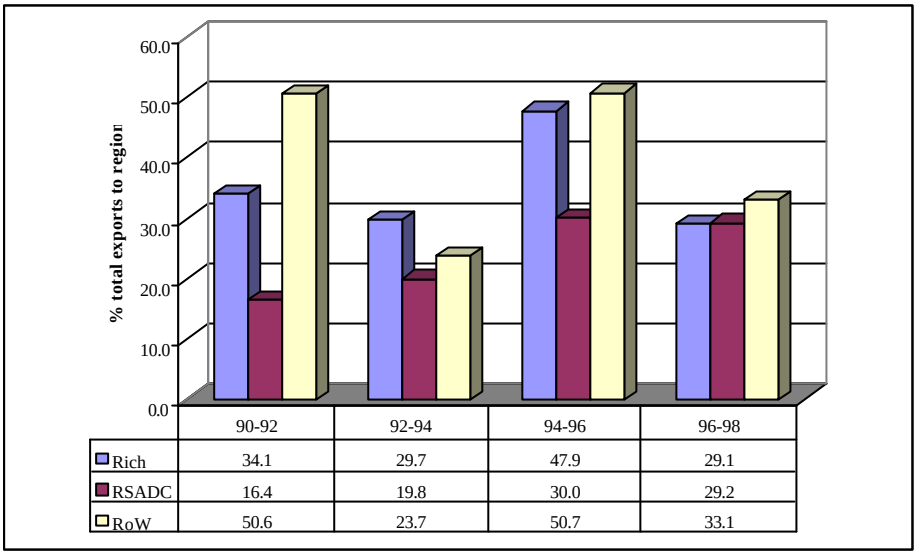
Table 13: Intertemporal view of the commodity breakdown for falling stars, % share

	1990-92	1992-94	1994-96	1996-98
Agriculture intensive	17.9	19.0	10.6	27.5
Mineral intensive	8.9	18.1	5.3	2.6
Unskilled labour intensive	5.8	13.2	44.2	0.4
Technology intensive	67.5	42.1	20.7	16.6
Human capital intensive	0.0	7.6	19.2	52.9

Three distinct trends are discernible in the commodity breakdown of falling stars. Firstly, mineral intensive products have been falling as a share of falling stars. An even stronger decline can be seen in the technology intensive sectors, which fell from 67.5 % in 1990-92 to only 16.6 % in 1996-98. On the other hand, South Africa has increasingly exported falling stars in human capital intensive sectors, the share of which increased from 0 % to 52.9 % between 1990-98. The large rise in 1996-98 is due to iron and steel which was previously a leading retreat. Also noticeable is the high share of agriculture intensive sectors, although they do not seem to follow a particular trend.

Figure 5 presents the percentage share leading retreat in total manufacturing exports according to geographical region.

Figure 5: Intertemporal view of SACU's regional market positioning for leading retreat, % regional exports



As shown in Figure 5 leading retreat has been a major share of regional exports to rich countries (between 29 % and 48 %) and the ROW (between 24 % and 50 %), while as a share of exports to RSADC it only developed as a major part from 1994-1996 onwards. Leading retreat as a share of export to RSADC increased from 16.4% in 1990-92 to 29.2 % in 1996-98. Two possible interpretations for this trend arise. Firstly, trade with RSADC may have increased the pressure for South Africa to restructure and move away from stagnating/decreasing markets. As mentioned earlier, these trends reflect reasonable success in moving out of stagnating markets. However, as shown in the breakdown of falling and rising stars, exports have shifted to the falling stars, rather than the more desirable rising stars. Secondly, in the face of greater international competition for declining markets, SACU producers are redirecting exports of these products away from rich countries towards RSADC. In this case RSADC is serving as a buffer against increased world competition. The redirection of these products towards RSADC is, however, still insufficient to prevent their share in total SACU exports from declining.

The commodity breakdown of leading retreats is highly volatile which prevents a coherent analysis. A large share of leading retreats between 1990-92 and 1994-96 can be attributed to the export of iron & steel. From 1994 the share accounted for by technology intensive products, largely chemicals (SIC 3511/3), rose.

Other classifications

The export volumes of the other classifications are very small compared to the first three classifications. Hence, in terms of share of total trade and as a share of trade to the region, the results are highly volatile and do not follow particular trends. It should nevertheless be mentioned that lagging opportunities have continuously increased as a share of trade to each region, which shows that South Africa restructured at least to some extent into growing world markets. However, unless these shares grow more rapidly, the opportunities to exploit these emerging markets will be lost. The commodity level analysis shows that lagging retreats are mainly in the agriculture intensive and unskilled labour intensive sectors, while lagging

opportunities include unskilled labour intensive, technology intensive as well as human capital intensive sectors (see Appendix). A high percentage of lost opportunities are made up of human capital intensive products. We also note a rising share of agricultural intensive products in the share of lost opportunity exports to RSADC. This could reflect the impact of increased competition in agricultural products with the region.

Conclusion

This study has presented a review of the literature on South African competitiveness emphasising the wide and diverse use of measures to 'unpack' the concept of competitiveness. The paper also presents various measures of static and dynamic competitiveness using post trade data. While this does not directly tackle the issue of competitiveness via a comparison of prices or costs, the approach of using post trade data to 'reveal' a country's comparative advantage is widely used. These measures complement each other and provide a fuller picture of the changing competitiveness of South African production.

A number of conclusions can be drawn from the paper. Firstly, the literature on the changing international competitiveness of South African production is mixed. Competitiveness as measured by the REER, unit labour costs, export diversification and export orientation increased during the 1990s. However, the structure of trade has remained relatively capital and technology intensive compared to other middle income countries, export growth has been mediocre compared to other dynamic emerging economies, and employment in manufacturing has continued to decline. It is clearly not only trade policy and/or international price changes that are causing these shifts, but a combination of these and government supply side policy, labour market institutions and macroeconomic forces that lie behind these trends. More detailed research on the extent to which trade liberalisation as opposed to these other factors have given rise to the changing patterns of trade is needed. This is imperative to ensure that domestic policies complement competitive forces dictated by the international environment.

Secondly, while the use of competitiveness measures is widespread, there is still need for a greater focus on the linkage between changes in the competitiveness indicators and the response in export and import behaviour. This is most relevant in the debate on trends in the REER which has focused more on the choice of correct weights and of prices, and not on whether these changes explain trade flows better. Some analysis at the aggregate level has been done, and the expected negative sign between REER and export flows is found. However, the aggregate analysis can only present a broad picture as through aggregation the changing competitiveness at the sectoral level is lost. This is particularly relevant to the South African debate as the export behaviour of natural resource intensive products has differed sharply from those of other products (Bell, 1993, and Bell *et al*. 1999). More detailed sectoral level analysis on the relationship between exports, relative prices, real exchange rates, world demand and trade policy is required. Few analyses on South Africa have pursued this in a rigorous manner using econometric techniques (Wood, 1995, is an exception). This analysis is important, as it is unclear to what extent domestic policies versus international price shifts dictate the changing structure of South African trade. Do we choose export sectors or do export markets choose us?

Thirdly, many approaches use post trade data South Africa to show that South Africa has a comparative advantage in natural resource intensive products. Paradoxically, South Africa is also shown to have a high share of exports falling within the human capital and technology

intensive sectors relative to other middle income countries. While the share of unskilled labour intensive products in total exports has risen the share is still low and suggests that South Africa has failed to make effective use of the comparative advantage that an abundant supply of labour provides. There is limited regional variation in the structure of exports, which may suggest that South Africa is not exploiting potential regional comparative advantages. This is not the case with imports which are highly differentiated according to region. Imports from rich countries predominantly fall within the higher technology products, while imports from RSADC are largely natural resource based.

These static approaches to competitiveness, using measures such as RCA, often fail to capture the changing competitiveness of trade over time. The paper, thus, develops a dynamic RCA measure to further explore the changing competitiveness of South African exports. This approach reveals there is substantial restructuring of exports out of declining world markets (leading retreat). However, this restructuring is increasingly not towards growing world markets (rising stars), but towards other stagnating markets (falling stars). There is limited regional variation, although the share of leading retreat and rising stars in total regional trade is relatively high in RSADC. The relatively high share of rising stars to RSADC suggests that trade with the region is being used as a platform through which to enter into growing world markets. The high share of leading retreats, however, suggests that exports to RSADC also serve as a buffer against increasing world competition in declining world markets.

While the dynamic decomposition developed in this paper is useful to analyse the changing structure of trade relative to the world market, its scope in predicting long term dynamic competitiveness is limited. For example, it is unclear whether the rising share of exports in falling stars is really an indicator reflecting South Africa's declining international competitiveness. Firstly, international prices and demand are volatile implying that a product declining in world markets one year, may rise in another. This partly explains the high variability in RCA growth rates shown in the text. Secondly, the capacity of South Africa to move into the export of technology and human capital intensive products (many of the rising stars) may be limited by the skills shortage as well as the rapid technological progress occurring within developed countries and some South East Asian economies. It may be more feasible for South Africa to expand in other resource or labour intensive commodities in which it already has a comparative advantage. Expansion into falling stars can serve as a stepping stone from which producers are able to enter into rising star categories. However, the approach is useful in highlighting that rising RCA values, do not necessarily reflect rising competitiveness as is often assumed. It further highlights the potential dangers for long term growth if South Africa's export bundle is increasingly concentrated in long term declining world markets.

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Appendix

Krause classification of manufactures (as in Tsikata, 1999).

SIC 3rd edition	Product
(1) Agricultural resource intensive	
311	Food
313	Beverages
314	Tobacco
323	Leather goods, fur excluding footwear and clothing
33111-3	Sawmills, planing and other wood mills
3411	Pulp, paper and paperboard
(2) Mineral resource intensive	
3512	Fertilisers and pesticides
353	Petroleum refineries
354	Miscellaneous petroleum and coal products
361	Pottery, china, earthenware
363-9	Building products and minerals, non-metallic
372	Non-ferrous metal basic industries
(3) Unskilled labour intensive	
321	Textiles
322	Wearing apparel, excluding footwear
324	Footwear excluding rubber, plastic footwear
331	Rest of wood, cork excluding furniture, and excluding 33111-3
332	Furniture, fixtures, excluding those primarily metal
522	Drugs and medicines
356	Plastic products n.e.s.
362	Glass, glass products
3811	Cutlery, hand tools, general hardware
3812	Furniture, fixtures primarily of metal
38329	Electronic components, communication
3841	Ship building and repairing
3849	Transport equipment n.e.s.
390	Rest of other manufacturing, excluding jewellery
(4) Technology intensive	
351	Rest of industrial chemicals, except 3512
3529	Chemical products n.e.s.
3813	Structural metal products
382	Machinery excluding electrical
3831	Electrical industrial machinery
3839	Electrical apparatus and supplies n.e.s.
3845	Aircraft
3851	Professional, scientific equipment
3852	Photographic and optical goods
(5)Human capital intensive	
341	Rest of paper and paper products excluding 3411
342	Printing, publishing and related
352	Rest of other chemical products excluding 3522
3551	Rubber products
371	Iron and steel basic industries
3814-9	Fabricated metal products n.e.s.
38321-8	Radio, television, communication equipment
3833	Electrical appliances and housewares
3842-4	Railroad equipment vehicles, bicycles 3853 Watches and clocks
3901	Jewellery and related articles

Top 10 and lowest 10 RCA commodities

Rank	1992	1994	1996	1998
Revealed Comparative advantage				
1	Railroad equipment	Railroad equipment	Railroad equipment	Railroad equipment
2	Iron & steel	Iron & steel	Sugar factories & refineries	Sugar factories & refineries
3	Engines & turbines	Wood products, nec	Iron & steel	Engines & turbines
4	Fruit & vegetables	Engines & turbines	Engines & turbines	Iron & steel
5	Non-ferrous metals	Fruit & vegetables	Distilleries & wineries	Fruit & vegetables
6	Wood products, nec	Paper packaging	Fruit & vegetables	Non-ferrous metals
7	Malt liquors & malt	Distilleries & wineries	Non-ferrous metals	Distilleries & wineries
8	Soft drinks	Malt liquors & malt	Fertilisers & pesticides	Wood products, nec
9	Pulp, paper & paperboard	Sugar factories & refineries	Distilleries & wineries	Fertilisers & pesticides
10	Metal products, excl	*Non-ferrous metals*	Malt liquors & malt	Pulp, paper & paperboard
Revealed comparative disadvantage				
10	Footwear	Products of leather	Manufacturing nec	Manufacturing nec
9	Products of leather	Footwear	Aircraft & spacecraft	Musical instruments
8	Manufacturing nec	Manufacturing nec	Motor cycles & bicycles	Articles of fur
7	TV, radio & communication	*Ship building & repairing*	Ship building & repairing	TV, radio & communication
6	Optical & photographic	Optical & photographic	TV, radio & communication	Footwear
5	*Musical instruments*	Prepared animal feeds	Optical & photographic	Petroleum refineries/
4	*Sawmilling & planing of*	Petroleum refineries	Sawmilling & planing of	Optical & photographic
3	Petroleum refineries	TV, radio & communication	*Prepared animal feeds*	Sawmilling & planing of
2	*Prepared animal feeds*	Sawmilling & planing of	*Petroleum refineries*	Prepared animal feeds
1	Clocks & watches	Clocks & watches	Clocks & watches	Clocks & watches

Notes: Commodities underlined (in italics) are amongst the top (lowest) 10 commodities when using change in RCA.

Commodity of geographical market positioning, % share

Rising stars	Rich				SADC				ROW			
	1990-92	1992-94	1994-96	1996-98	1990-92	1992-94	1994-96	1996-98	1990-92	1992-94	1994-96	1996-98
Agriculture intensive	22.1	10.9	20.1	0.0	25.9	3.8	15.5	0.0	23.0	24.2	15.1	0.0
Mineral intensive	3.0	0.0	52.8	0.0	2.5	2.0	25.4	0.0	2.6	1.6	64.0	0.0
Unskilled labour intensive	35.2	17.0	1.1	60.7	30.1	9.3	4.3	48.2	42.7	4.2	1.1	56.6
Technology intensive	25.6	64.2	17.3	31.0	29.3	43.9	42.9	25.0	17.3	55.3	15.3	28.8
Human capital intensive	14.0	7.9	8.8	8.3	12.2	41.1	11.9	26.8	14.4	14.7	4.6	14.7
Falling stars	**Rich**				**SADC**				**ROW**			
Agriculture intensive	22.6	18.8	11.5	20.2	11.6	14.6	9.5	34.7	12.8	25.0	9.9	36.2
Mineral intensive	3.6	15.2	5.6	2.7	22.6	19.1	4.2	3.7	10.1	23.7	6.1	1.9
Unskilled labour intensive	1.5	13.0	47.7	0.3	0.8	16.6	43.8	0.7	17.6	9.4	35.2	0.4
Technology intensive	72.4	47.2	16.7	15.8	65.0	36.3	25.2	29.7	59.5	37.9	24.9	12.3
Human capital intensive	0.0	5.9	18.5	60.9	0.0	13.5	17.3	31.2	0.0	4.1	23.9	49.2
Leading retreat	**Rich**				**SADC**				**ROW**			
Agriculture intensive	0.7	38.7	22.3	19.1	0.3	31.4	27.6	20.3	0.0	45.5	25.2	10.8
Mineral intensive	37.5	29.7	0.0	36.4	24.4	10.8	0.7	24.5	17.6	29.7	0.4	41.7
Unskilled labour intensive	1.2	31.4	7.0	8.5	3.8	55.5	13.1	4.6	0.9	24.7	3.2	5.3
Technology intensive	3.1	0.0	28.1	35.2	19.8	0.0	25.7	43.9	0.9	0.0	21.0	40.3
Human capital intensive	57.5	0.2	42.6	0.9	51.7	2.4	32.9	6.8	80.5	0.2	50.2	1.8
Lagging retreat	**Rich**				**SADC**				**ROW**			
Agriculture intensive	59.8	20.7	0.0	0.1	65.6	32.8	0.0	10.9	73.0	55.8	0.0	15.7
Mineral intensive	7.2	0.0	0.0	99.9	8.9	0.0	0.0	89.1	1.0	0.0	0.0	84.3
Unskilled labour intensive	33.0	79.3	100.0	0.0	25.5	67.2	100.0	0.0	25.9	44.2	100.0	0.0
Technology intensive	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Human capital intensive	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost opportunity	**Rich**				**SADC**				**ROW**			
Agriculture intensive	4.9	0.7	2.9	53.7	3.4	9.8	26.2	33.8	9.0	1.8	19.0	19.9
Mineral intensive	0.7	0.2	22.7	0.0	6.7	1.8	9.6	0.0	4.3	0.3	8.0	0.0
Unskilled labour intensive	31.0	3.6	0.0	10.4	32.2	11.1	0.0	19.7	24.7	1.6	0.0	9.2
Technology intensive	29.8	9.6	71.4	4.6	20.6	36.0	48.0	8.2	20.1	7.9	58.6	6.7
Human capital intensive	33.5	85.9	3.0	31.3	37.2	41.3	16.2	38.3	42.0	88.5	14.4	64.2
Lagging opportunity	**Rich**				**SADC**				**ROW**			
Agriculture intensive	0.0	74.0	0.0	0.0	0.0	85.0	0.0	0.0	0.0	95.6	0.0	0.0
Mineral intensive	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unskilled labour intensive	87.1	0.0	0.0	66.3	61.9	0.0	0.0	39.7	76.1	0.0	0.0	25.5
Technology intensive	0.0	0.0	100.0	11.3	0.0	0.0	100.0	33.6	0.0	0.0	100.0	17.9
Human capital intensive	12.9	26.0	0.0	22.4	38.1	15.0	0.0	26.8	23.9	4.4	0.0	56.5