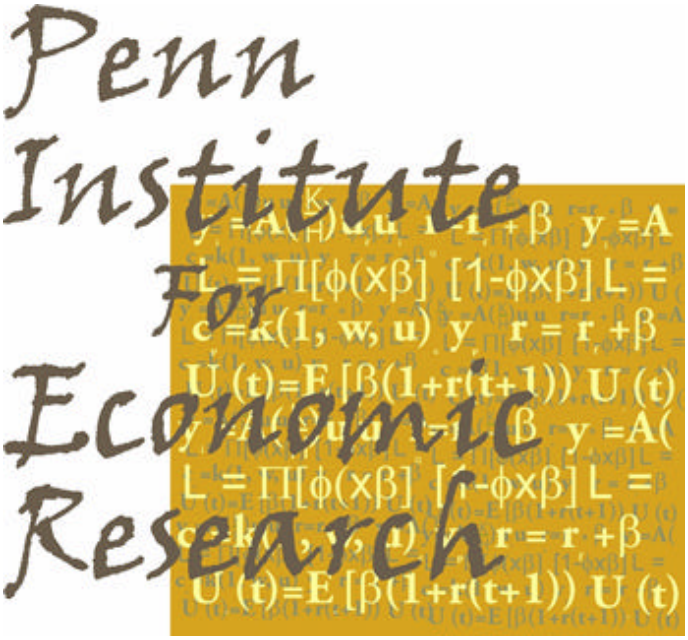

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PIER Working Paper 03-020

"South Africa's International Competitiveness:
A Product Level Analysis"

by

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http://ssrn.com/abstract=430740

South Africa's International Competitiveness

A Product Level Analysis

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South Africa's International Competitiveness

A Product Level Analysis

Abstract

As South Africa emerges from its Apartheid period, the evolution of its international trade is vital to the growth of the economy. This paper evaluates South Africa's trade performance in three essential markets, namely United States, Europe and Japan. It examines the nation's flexibility in the face of fluctuations in relative exchange rates in its markets. Using the Constant Market Share (CMS) model of international trade and the "Rising Stars" model, the particular areas of industrial structure in which South Africa is positioned to succeed are identified on the market as well as the product levels.

Keywords: Apartheid; South Africa; Southern African Development Community (SADC); United States, Japan, European Union; International Competitiveness; Entrepreneurship; Exchange Rate Responsiveness; Constant Market Share (CMS) model.

JEL Classifications: F1, F4

1. Introduction

This study examines South Africa's trade performance in three major markets - the United States, Europe and Japan at a detailed product level. An introduction consisting of a brief historical and theoretical background to South Africa's trade position is given in Section I. The hypothesis is stated in section II, while the methodology, with a detailed discussion of exchange rate responsiveness to exchange rate changes and the constant market share model, is in Section III. The data and the empirical model and estimates follow in Section IV and V, respectively. Finally, Section VI concludes the study with a summary.

1.1. Historical background

During this past decade, South Africa has emerged from the Apartheid period. In terms of the foreign sector, this has meant great potential opportunities, both in the areas of regional integration as evidenced by its joining the Southern African Development Community (SADC) in 1994, and in the area of merging and joining the dynamic multilateral trade system as represented by World Trade Organization (WTO).[1] In fact South Africa has moved in both directions. The focus of this thesis is on the latter.

As South Africa renegotiates its trade relations in international markets, notably in the European Union (EU), Japan and US markets, a number of empirical questions need to be addressed. One such question is whether the nation has the competitive strength to survive in these markets. This question is considered against the background of changes in these major markets at the individual product level, as well as at the macro level of

relative exchange rates. Specifically, does South Africa demonstrate evidence of the flexibility necessary to adapt to these changes in the foreign markets. This question is especially timely in light of the recent position taken by South Africa as it joined the WTO. In short, South Africa has agreed to reduce its tariffs on many commodities and in some instances by even more than is proposed by the WTO.[2]

Typically, South Africa's trade in these major markets has been characterized by exports of mainly traditional goods, and imports of manufactured goods. The bulk of its manufactured exports flow to partner countries within the SADC. In 1992, as post-Apartheid South Africa turned its attention to re-energizing its foreign sector and reintegrating its economy into the emerging Global village, only 25 percent of its manufactured exports were directed to the major Industrialized markets of the Organization for Economic Co-operation and Development (OECD).[3]

Within the regional trade areas of SADC and Southern African Customs Union (SACU), South Africa's position is relatively secure. However, it is generally understood that in order to survive in today's international environment of rapid globalization, a country cannot rely primarily on inter-regional trade. Such trade tends to be "protected" from forces of international change and competition, and hence tends to diverge over time from optimal technological norms. Hence, it tends to fail to reflect a country's true comparative advantage[4]. Given this situation and the speed at which globalization is moving, it can thus be argued that as a matter of priority, South Africa needs to focus on the major markets lying outside of the continent.

An important ingredient for success in the manufactured exports of any country in the modern global environment is response flexibility to rapidly changing market

environments. This involves the ability to shift and refocus resources to match changes in world demand patterns. A main component of such flexibility involves the degree of price responsiveness of its export performance. A major and recurring theme in the discussion of the reasons for Africa's relative sluggish performance in world markets focuses on the historically distorting influences of marketing boards and official government pricing policies which tended to shielded producers from world price signals.[5]

This paper examines the degree and nature of such international price responsiveness, both at the aggregate, and at detailed product and sector levels. It considers certain categories of manufactured exports in which South Africa should be able to take advantage of opportunities or avert the threats arising due to changes in its global environment. Thus, it identifies those particular areas of industrial structure in which South Africa is positioned to succeed.

1.2. Theoretical background.

This paper is divided into four sections, each of which will explore a separate issue which provides an answer to the question as to the likelihood a country's foreign sector may be expected to provide a shift in comparative advantage to high value-added activities, and hence help provide an environment promoting low unemployment rates and political stability.

The first section examines the issue of exchange rate flexibility and responsiveness of South Africa's manufactured exports. The second analyzes the Constant Market Share model. The third section combines the insights from the previous

two sections, and focuses on the exchange rate flexibility of certain subsets of manufactured exports – those in which South Africa has been revealed to enjoy an innate degree of dynamic competitiveness..

The first area of inquiry is introduced discussing evidence of exchange rate flexibility of South Africa's manufactured exports. Theoretically, volatility in exchange rates affects the volume of trade flowing between countries, via the changes in a country's bilateral, or relative terms of trade; or specifically via changes in sector relative terms of trade. In particular, a country which is "in tune" with world trade and financial forces, and whose foreign sector is liberalized and profit oriented will tend to expand the exports of those sectors in which relative unit profitability grows. In such countries, it follows that we should expect to find exports growing relatively rapidly to those trade partners whose exchange rates are strengthening.

For example, let us assume that $U.S. 1 = 100 Yen. Let us also assume that a machine produced in South Africa, which costs 7 million Rands, sells for $1 million in the U.S., and 100 million Yen in Japan. Clearly the South African exporter is indifferent as to which (convertible currency) market to target. Now, suppose the U.S. Dollar were to appreciate against the Yen, say $1 = 120 Yen. Assuming that the respective local currency prices in the US and Japan remain fixed , then the same machine will now yield a higher profit to the South African exporter if exported to the US (relative to the smaller profit should the same machine be exported to Japan). Straightforward economic logic would suggest that in such a case, South Africa's exports should be shifted from the Japan to the US market. It is precisely this responsiveness to (relative) exchange rate

movements that is essential to survival in the new world environment, and which is examined in detail below.

Improvements or deterioration in relative exchange rates have been demonstrated to result in changes in export volumes of the countries trading in those affected markets.[6] We here wish to determine whether the changes in South Africa's relative focus on its major markets has been rationally consistent with the observed changes in the relative exchange rate fluctuations observed from the perspective of its manufactured exports.

It is further documented in the literature that different industrial sectors and product groups tend to exhibit different degrees of exchange rate responsiveness and flexibility[7]. A secondary issue then that is explored is to identify which particular product groups were especially sensitive (or insensitive) to changes in relative market exchange rates. A finding of sensitivity would imply the presence of underlying flexibility to changing economic environments, and hence bode well to the positioning and chances of this product group to succeed in the rough and tumble world of international competition.

The second section focuses its analysis on the use of the Constant Market Share (CMS) model of international trade. As noted, success in the modern competitive global village requires revealed flexibility to rapidly changing market conditions. The CMS Model is an especially useful empirical tool that allows us to examine the nature and sources of changing international competitiveness. It reveals whether (and in which product groups) South Africa was able to competitively increase its exports above and beyond constraints set by external demand factors. In terms of this model, a country is regarded as doing well if its exports grow in line or faster than the export growth in the

market. This empirical model is used to assess South Africa's export performance in total, and various subsets of manufacturing exports. Later in the paper, the CMS tool is discussed along with an explanation of the methods of its use for the purposes of this study. Finally the third section combines the previous two, and explores the relationship between the international exchange-rate flexibility, with the revealed CMS international competitiveness.

2. Hypothesis

This paper has a dual, or nested hypothesis. First, we posit that the choice of market targeting, at the country level, does make a significant difference in the performance of South Africa's manufactured export success to the Industrialized OECD market. Second, we posit that the *competitiveness effect* on export success will be found to be especially notable for those product – groups the exports of which are relatively more sensitive to changes in relative destination-market exchange rates.

3. Methodology

This section discusses the theoretical constructs that are used in analyzing and interpreting the data. It presents the theoretical models and details the manner in which they are used to draw specific inferences. Section 3.1 discusses the exchange rate flexibility model[8].

3.1. Exchange Rate Responsiveness of South Africa's Exports

The total U.S. dollar value of South Africa's manufactured exports to each of the three major Industrialized markets is calculated for each of the years from 1992 to 1999. Later this is repeated for each of the several subset key product groups. These are then presented and used in ratio form (for example, South Africa's manufactured exports to U.S. divided by those to Japan).

The second variable used is the exchange rate for Japan and for Europe, vis-à-vis the United States respectively. Given the small degrees of freedom available, the consideration of other independent variables is not considered. It is determined that during the period covered, real exchange rate changes were very highly correlated with nominal changes, therefore the decision was to use the nominal exchange rates.

Then a bivariate (time-series) regression model is estimated, in which the relative market ratio for South Africa's manufactured exports is regressed on the respectively relevant exchange rate. For example, the U.S. bound exports divided by Japan bound exports are regressed on the Yen/U.S. $ exchange rate. The inference is drawn from the sign and the statistical significance of the calculated slope beta. In this particular case, rational international responsiveness and flexibility would be inferred from a statistically significant positive coefficient, since as the value of the Yen/$ exchange rate rises, it becomes profitable to shift South Africa's exports from Japan (whose currency is depreciating in value) to the U.S. market (whose currency is gaining in value).

3.2. The Constant Market Share (CMS).

The constant market share model is adopted from the sub-discipline of marketing, and is used to explain changes in a country's share of trade in world markets. It may be demonstrated that CMS analysis is an alternative form of the so-called 'shift and share' analysis,[9] first used in regional economics by Creamer (1943). The key phenomenon explained in this model is the extent by which the growth in a country's differ from the world, or reference-market's average.[10]

At the heart of the CMS model is the assumption that a country's share in world markets should remain unchanged over time. The difference between the export growth implied by the constant-share norm and the actual export performance can be attributed to four principal components. These are; (a) the world trade effect, (b) commodity composition effect, (c) market distribution effect, and (d) residual general competitiveness effect[11]. The measurement is done in stages. At the first stage exports may be viewed as a single good destined for one market[12]. This is called the 'world trade effect' and is presented in the following form:

$$\sum_{i=1}^{n} rX_i$$

where, 'Xi' is the export of ith commodity group of a focus country at the base year, 'r' is the percentage increase of total world exports between two points of time, and 'n' represents the number of export items. The sign of the 'world trade effect' is very important. If it is positive, then it indicates that a country has maintained its export share in the foreign markets, vis-à-vis the world.

In the second stage, the export growth of the *reference* country is decomposed into the the commodity composition effect, which is described in the following form:

$$\sum_{i=1}^{n} (r_i X_i - r X_i) \qquad (2)$$

where, r_i is the percentage increase of world export of the commodity group i, between two time periods. If an increase of exports by a country is more than the world average in the similar commodity classes, the sign of commodity composition would be positive and vice versa. The positive sign further suggests that the export country had concentrated on export commodities whose markets were growing relatively fast and vice versa.[13]

At the third stage, the export growth of the country is then disaggregated into: (1) *world trade effect*, (2) *commodity composition effect*, and (3) *market distribution effect*. The market distribution effect is defined as follows:

$$\sum_{i=1}^{n} \sum_{j=1}^{m} r_{ij} X_{ij} - \sum_{i=1}^{n} r_i X_i \ldots. \qquad (3)$$

where, r_{ij} is the percentage increase of the world export of the commodity group i in the jth market between two points of time. The number of foreign markets is denoted by 'm'. A positive sign suggests the comparative ability of a reference country to increase its exports of similar commodity classes in the relatively growing markets. A negative sign suggests that the exports are concentrated in stagnant markets.

At the final stage the residual, *competitiveness effect* is derived. This is defined as follows:

$$(X^1 - X) = \sum_{j=1}^{n} r_{ij} X_{ij} \ldots.. \qquad (4)$$

where, X^1 and X are South Africa's manufactured exports for the terminal and base year respectively. For the specific export commodity, the residual is arrived at as follows:

$$(X^1 - X) = \sum_{i=1}^{n} \sum_{j=1}^{m} r_{ij} \quad X_{ij} \ldots. \qquad (5)$$

where, the terms in parentheses are the exports of the specific commodity in the terminal and the base year respectively.

Since the external, demand factors of *commodity* and *market effects* are already been explicitly taken into account in the CMS model, it is often argued that the residual embodies, primarily domestic supply factors. It reflects "…differential rates of quality improvement in the efficiency of marketing or in the terms of financing the sale of export goods; and … differential changes in the ability for prompt fulfillment of export orders"[14].

In short, the *competitiveness effect* indicates the extent to which a country is able to gain international market shares despite potentially adverse world demand movements, in terms of both market and commodity. Therefore, it is often interpreted as indicating the dynamic ability of a country to respond to changing environments and adapt its supply situation to world conditions[15]. A positive sign of the residual implies the improved position of exports in terms of competitiveness, whereas, the negative sign reflects the deterioration in the country's export due to fall in competitiveness. Of these four effects, the *market effect* reflects trade policies, and changes in income as well as relative exchange rates within target markets for South Africa's exports. In this paper we will be focusing primarily on the *competitiveness effects.* Specifically, the focus, is on the changes in this *competitiveness effect* over time, and examining its relationship to explicit international price (exchange rate) shifts in the major markets

Finally, the analysis is repeated for a selection of strategically interesting or important sectors or product groups. From a practical public policy point of view, the interest is to identify those detailed product groupings and sectors, which indeed exhibit a high degree of exchange rate flexibility.

4. The Data.

Two sets of data are used in this study. The first is an extensive set of trade data whose source is the **Comtrade** data set, compiled and maintained by the United Nations Statistical Office in New York. Ordinarily the office organizes, prepares and presents items from this data; or uses specialized tools such as **TradeCAN** – a software package prepared by ECLAC. However, in order to be able to maximize the flexibility of use of the data, our software was prepared and applied directly to the raw data files.

The data set has the exports and imports from eight major OECD countries (six from Western Europe – the original E.E.C. including UK) plus the U.S. and Japan, as well as "World"; and then separately, exports and imports to and from South Africa for the years 1992 through 1999.

Each year's data includes, in thousands of $U.S. values for 101 manufactured traded commodities, ranging from Standard International Trade Classification (SITC, Rev 1) categories 5 through 8. The advantage of using Rev. 1 is that is renders this dataset consistent with historical data, thus allowing for long term analyses.

The second set of data used consists of annual macroeconomic variables, including exchange rates, whose source is the International Monetary Fund's *International Financial Statistics.*

5. The Empirical Model

This section presents the results of empirical estimations of a simple bivariate model testing for a parameter indicating a statistically significant degree of shifting from one export destination to another as a response to changes in relative exchange rates (and hence relative profitability levels) between the several major segments of the industrialized OECD market.

The following section, utilizing the CMS Model, examines the relative importance of destination changes in the performance of the export sector during this period.

Finally, the interaction between these two approaches will be described. As noted, we examine whether those product groups which were characterized by relatively large or increasing *competitiveness effects* coincided with those which demonstrated high levels of flexibility with respect to changing relative-market exchange rates.

5.1 Exchange Rate Responsiveness

The following equation was estimated for the years 1992 through 1998:

$$\textit{Ratio of S.A. Exports}_{ij} = ß_0 + ß_1 * \textit{Exchange rate}_{ij}$$

where i and j represent two industrialized country markets for South Africa's manufactured exports. These are two of the following three: Western Europe, the United States, and Japan.

The first regression estimated for all Manufactured Exports had as the dependent variable (ueratio), the ratio of South Africa's exports to Europe divided by those to the United States. The explanatory variable was the DM per dollar rate (xratedm).

The following are the estimated results:

The REG Procedure

Dependent Variable: ueratio

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	-0.29277	0.17905	-1.64	0.1774
xratedm	1	0.39229	0.11037	3.55	0.0237

This regression, whose adjusted $R^2 = 0.70$ has a ß = 0.39229. This coefficient is positive and statistically significant, as indicated by its probability value of 0.0237, which is clearly less than the critical value of 0.05. The positive slope coefficient supports the hypothesis of the presence of dynamic flexibility in South Africa's market orientation of its manufactured exports. As xratedm increases, the dollar is strengthening against the DM. The positive coefficient indicates that for exports destined to the US or the European Union, South Africa indeed did act "rationally" by increasing its proportion of manufactured exports to the market whose currency's value was rising in international currency markets at the expense of the other, whose exchange rate was relatively declining.

The second regression estimated compared the US and Japanese destinations for South Africa's manufactured exports. The results are the following:

Dependent Variable: ujratio

Parameter Estimates

Variable	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	-0.99359	1.02192	-0.97	0.3860
xratejp	0.02634	0.00912	2.89	0.0447

The dependent variable ujratio is the South African manufactured exports to the U.S. divided by those to Japan. The explanatory variable xratejp is the Yen/$ ratio. The adjusted R^2 was 0.59. Once more the slope coefficient is positive and statistically significant (at the 5% level). Again this supports the hypothesis that South Africa's manufactured exports rationally responded to shifts in relative profit margins caused by exchange rate fluctuations among its major industrialized-country markets.

Finally, the cross-rate was used to examine the responsiveness of Japan-Europe destinations to changes in the Yen/DM rate. The following are the results:

Dependent Variable: jeratio

Parameter Estimates

Variable	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	0.34490	0.10256	3.36	0.0282
xrateje	-0.00242	0.00149	-1.63	0.1794

In this case the β_1 is negative. However, this is still the "correct" sign which would tend to support the "flexibility hypothesis" in describing South Africa's export responsiveness to dynamic changes in exchange rates among its markets. This is because as the explanatory variable rises, the Yen is weakening (with respect to the

DM). The negative slope indicates a tendency to react to this by shifting away from the (declining) Yen market to the (relatively rising) DM market.

However, the adjusted R^2 was only 0.25, and the slope coefficient is not statistically significant. At most, it could clearly be stated that this result does not support the inference that South Africa's exports to Japan and Europe contradicted that behavior which would indicate rational flexibility.

5.1.1. A Product Sectoral Analysis of Exchange Rate Responsiveness

In section 5.1 above it is noted that South Africa's manufactured exports did in fact exhibit statistically significant shift responses to exchange rate changes from one to another of the industrialized markets.

Were the commodity compositions of manufactures exported to different Industrialized country markets different one from the other? The answer might be found by examining the ratios of various product sectors (to the total) of South Africa's exports in each of these markets for several important product groups.

One of the major single product groups, the Resource Intensive manufactures, which in 1990 made-up close to 40% of all manufactures in South Africa[16]. The ratios of this product group, or sectors, will be examined in 1998 in each of the major OECD markets. In that year, this product group made up 3.3% of all South African manufactured exports to the U.S., 17.1% of all Europe bound manufactured exports, and 36.9% of those exports bound to Japan. Clearly compositional similarity is not characteristic across these markets for South Africa's manufactured exports.

An important question that should be explored is whether this exchange rate sensitivity existed at the intra-sector level. Since the commodity or product compositions differed somewhat from market to market, the shifts from one market to another induced by changes in the relative exchange rates may have had both a geographical effect and a product compositional effect.

One way to test this is to see whether significant exchange rate reactions may be observed within groups of similar types of products. If such intra-product group effects are noted, then it is likely that the changing exchange rates did not have major product – composition effects. However, if such effects are not present, then it must be true that the (major) changes occurred between the product groups, resulting in major changes in the nature and composition of South Africa's exports.

The following tables examine the betas from equation [2.1], which was estimated, separately for subsets of the data, where the products examined in each case were restricted to single product sectors, as defined in Nordas.[17]

Table A2 The Estimated Slope Coefficients From Regressing U.S. / Japan Export Market Ratios on Exchange Rates By Product Sectors

Product Sector	**ß$_1$ (and p-value)**	**adj R^2**
All Manufactures	.03 (.04)	.59
Low Technology	.02 (.15)	.23
Medium Technology	.01 (.46)	-.07
High Technology	.31 (.41)	-.03
Low Wage	.003 (.80)	-.18
Medium Wage	.06 (.08)	.39
High Wage	.003 (.93)	-.25
Resource Intensive	-.02 (.19)	.23
Labor Intensive	-.01 (.57)	-.12
Specialized Supplier	-.15 (.70)	-.20
Scale Intensive	.07 (.02)	.62
Science Based	.07 (.08)	.46

Since any product sector for whom the probability (or p) value is greater than .05 is not statistically significant, it is clear from the above that no significant intra-sector market substitution took place as a reaction to changes in exchange rates. Only one

sector is found to have a statistically significant reaction to changing relative exchange rates between the U.S. and Japan, and that is the Scale Intensive group[18].

Similarly, only one product group (Science-Based products) had a statistically significant beta for the shifts between Europe and the U.S.; and none were found to be significant for exchange rate shifts between Japan and Europe. Thus, it is possible to conclude that the significant reaction that was found for all-products must have reflected mainly inter-group shifts. Hence, it could be concluded that the shifts from one market to another are accompanied by major product compositional changes during this period.

The only exceptions to this broad statement were found within the Scale-Intensive, and the Science-Based product groups. We shall focus our attention on these two groups in the following section to determine whether this revealed international market flexibility translated into measurable success in export penetration; and if so, what factors seem to best explain this relative success.

5.2. CMS analysis of South Africa's Export Growth.

5.2.1 All Manufactured Exports

Constant Market Share analysis is applied to all 101 manufactured exports, separately for each of the three major industrialized markets, Western Europe, U.S. and Japan. As explained above, this analysis will compare South Africa's export performance for each product and in each market against the world trade (total imports) for each of these commodities and markets respectively.

The pertinent results for All South Africa Manufactured Exports to the OECD are summarized in the following table:

Table 1 **Constant Market Share Effects –All Manufactured Exports 1992-1999**

Period	Actual Change ($Millions)	World Trend	Commodity Effect	Market Effect	Competitiveness Effect
1992-99	19.4	10.8	-1.7	-1.6	11.9
1992-95	8.2	5.8	-3.6	-0.3	6.3
1995-99	12.1	23.8	-1.9	-4	-5.8

The entire period from 1992 to 1999 is examined to determine what happened during this time. The increase in total manufactured exports during this time to the industrialized markets was close to $20 million. This may be decomposed into an increase of $8 between 1992 and 1995, and a further increase of $12 million between 1995 and 1999. During the entire period, South Africa gained overall market shares in the OECD market for manufactured imported goods. Growth to the OECD of close to $20 million) was almost twice what would have occurred if these exports merely matched the overall growth of the market (in which case, they would have grown only by close to $11 million). This ability to perform above and beyond the overall trend is seen not to be attributable to a fortuitous commodity composition. That is, in 1992, South Africa did not happen to specialize products, which happened to grow faster than average during the rest of the decade. Nor did South Africa happen to enjoy a fortuitous market composition (relatively rapidly growing markets). We see this since both the *commodity effect* and *market effect* were in fact negative. That is, South Africa succeeded in "beating the trend" despite an initial specialization in the "wrong" commodities and markets.

Technically, the full difference between the actual export performance, and the *World Trend* effect is clearly attributable to the *competitiveness effect.*

However, the decomposition into two sub-periods (1992-95, and 1995-99) clearly tells us that the relative success was fully reflecting performance in the first half of the decade. A full 76% (6.34/8.3) of the actual increase from 1992 to 1995 in exports is attributable to the *competitiveness effect* during that period (as compared to 61% (11.9/19.4) for the entire sample period of 1992-99).

The second half of the decade (1995-99) reveals a completely different competitiveness pattern. Though the total OECD-bound manufactured exports grew (from 8 to 12 million), the potential offered by the rapidly growing market in the latter half of the decade was not at all matched by South Africa's performance. Had South Africa merely maintained a constant share of the OECD market from 1995-99, it would have exported not $12 million more, but rather $23.8 million more than it had in 1995. It is true that some of this failure to maintain trade market shares may be laid at the feet of negative *commodity* and *market effects* (15.5% and 32.8% respectively). However, the main effect to which this market loss may be attributable is a negative *competitiveness effect* (47.4%).

Such a poor performance calls for further detailed study of the underlying causes of this failure. The CMS model gives us a reasonable starting point for such an analysis. If we consider the *competitiveness effect* as predominantly reflecting domestic supply considerations, then we may surmise (as a reasonable working hypothesis) that it is probably not to be blamed on external market forces outside the control of South African

behavior or policy. No. The results reflected in the negative *competitiveness effect* clearly state that “the fault is not in our stars but in ourselves”.

The CMS model cannot spell out which policies, or practices caused this problem. Was it because labor unions ignored productivity considerations when making wage demands? Was it because of an overvalued exchange rate? Was it because the industrial base found it difficult to convert military hardware to civilian products that might have sold better abroad? Was it because the hothouse environment engendered by the captive SACU, or increasingly SADC markets acted against the ability to produce world-class products of acceptable standards? Might it perhaps be related to the inability to maintain a flexible stance internationally in the face of rapidly changing international trade environments, including relative destination-market exchange rates?
right market destinations, South Africa "shot itself in the foot."

However, the CMS model may indeed be used to shed light on the probably culpability of various alternative “candidates” for the observed failure during the latter years of the past decade. This is by recalculating the model for a subset of products, which had been found to be relatively responsive (in the right direction) to relative exchange rates in South Africa’s OECD markets. Presumably, if this particular rigidity is an important explainer of the market share loss in this particular market experienced by South African exporters, then we should expect to find a much smaller (proportional) negative, or perhaps even a positive competitiveness impact for such a subset. We will present the results of such a test for a relatively small, but potentially fast growing termed *Science Based Products.* These include aerospace products, computers, pharmaceuticals and scientific instruments.

Table 2 **Constant Market Share Effects –Science Based Exports 1992-1999**

Period	Actual Change ($Millions)	World Trend	Commodity Effect	Market Effect	Competitiveness Effect
1992-99	1.1	0.47	0.14	-0.11	0.60
1992-95	0.23	0.25	-0.05	-0.003	0.03
1995-99	0.92	0.71	0.22	-0.16	0.16

While in actual $ value figures, South Africa's exports of this category of manufactures was clearly not very impressive, the results summarized in Table 2 provide support for the initial hypothesis. This stated that changes in South Africa's international market shares may be in part explained by the lack of responsiveness to international price changes, signaled by fluctuating relative exchange rates between destination markets. For this subset of exports, South Africa maintained close to a non-changed share of OECD imports in the first half of the decade, and increased its share during the (relatively disastrous) second half. We note that the *competitiveness effect* was positive, both for the entire period, and for each of its subsets. Of course, no firm conclusions may be drawn from one such illustration; especially with such a marginal subset of exports. This was meant primarily as an illustration of how the CMS approach may be used to shed a deeper understanding of the sources of observed changes in international competitiveness at the detailed product level.

6. Conclusion

There are many factors that may affect the country's ability to successfully compete in world markets. This study focuses on two methods that may help us identify key elements, shaping South Africa's performance in the critical and growing sector of manufacturing exports. The analysis is focused on the major industrialized country markets, since South Africa does not enjoy any particular preferences here, and therefore its successes (or failures) in these markets may be clearly be associated with comparative advantages, and the ability to compete head to head with the world's low cost manufacturers. We posit that supply rigidities, such as a relative lack of price responsiveness in international markets may prove important in explaining the general failure to maintain market shares in manufactured imports into the OECD markets during the last decade of the 20^{th} century.

The results obtained via regression analysis indicate that indeed South Africa failed to demonstrate a "rational" responsiveness in market targeting to changes in relative market exchange rates in its manufactured exports. However, in a few, relatively non-traditional subsets of manufactures this was not the case.

We then demonstrate the nature of the loss of market shares, and attribute it primarily to the second half of the decade, and primarily to internal policy or structural causes, rather than external factors associated with negative environmental factors. Finally, we illustrate in a suggestive analysis of Science-based exports, that a higher degree of responsiveness to international market relative exchange rate movements may have reversed the observed losses, even in the face of initial unfavorable compositional factors.

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