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# Entrepreneurial Failure and South Africa's Performance in the World Trading Environment*

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In the past four decades, Sub Sahara Africa has been notable in its relative development-performance failure. There exists a growing literature emphasizing the role of the entrepreneur as an essential element in economic development. We argue that the relatively sluggish growth observed in South Africa may be attributed, at least in part, to entrepreneurial failure. Emerging from its Apartheid era with a concomitant embargo on its trade, South Africa has been actively liberalizing its economy, positioning it for integration into the world trading system since the early 1990s. Following several decades of import-substituting efforts, this

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signals a clear shift toward a liberalizing, export-promoting development strategy on the part of its government. Despite these efforts it has failed to translate its great potential to actual performance. We evaluate the role of entrepreneurial flexibility in South Africa's trade performance in three major and, to South Africa, critical export markets, those of the United States, Europe and Japan.

## 1. Introduction

This study, following on the growing base of literature emphasizing the role of the entrepreneur as an essential element in economic development,[1] examines empirical support for the proposition that much of the malaise characterizing South Africa's manufactured exports in the past decade may be explained by a lack of entrepreneurial flexibility within South Africa's exporting sectors. 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 Sections 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 Apartheid. In terms of the foreign sector, this meant great potential opportunities in the context of joining the dynamic multilateral trade system as represented by World Trade Organization (WTO).[2]

As South Africa renegotiated its trade relations in international markets, notably in the European Union (EU), Japan, and US markets; a critical question was whether the potential exporting firms of South Africa have the competitive strength to survive in world markets. Unlike most African countries, South Africa does have the strengths associated with the first three facets of Porter's diamond.[3] It has a relatively large domestic market in addition a traditionally captive market in the other of the South African Union. It is relatively rich in factors, in terms of raw materials, commodities, and industrial skills. Finally, the degree of self-reliance forced on this economy during the two decades of international embargo, has bequeathed it with a relatively sophisticated network of related and supporting industries, including high-tech defense-related industrial networks. However, the fourth facet of Porter diamond, namely requisite demonstrable strategic resolve and flexibility on part of its entrepreneurs, has yet to be demonstrated.

We explore an essential dimension: price responsiveness and flexibility. This issue has been argued to often constitute a critical bottleneck to international competitive success, both in general, and specifically in Sub-Sahara Africa. Opening up one's economy to world competition is a two edged sword. On the one hand, it offers a country the bounty associated with international specialization, relatively huge markets for its exports, and relatively low costs for the imported inputs. On the other hand, it forces the domestic industrial sectors to

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[1] E.g., Baumol, W 2002, pp. 1-9.

[2] Ng'ong'ola, C.: 2000, p 501.

[3] See Michael Porter, , *1998* for a concise discussion of the necessary conditions for a firm to attain and maintain superiority in world markets.

liberalize their operations and provide flexible supply responses to the constantly shifting international markets.

This dilemma is especially germane to the South African government, as it is determined to join the international trading system. Since 1992, as it turned its attention to re-energizing its foreign sector and reintegrating its economy into the emerging global village, South Africa has reduced its tariffs on many commodities and in some instances, by even more than that proposed by the WTO.[4]

This strategic stance has placed the entrepreneurs of South Africa's industrial firms in a position similar to that faced by the Eastern European members of the former COMECON transitional economies. The Russian and Eastern European managers had learned to pursue output goals of GOSPLAN, or similar one or five year plans. Their success had depended upon satisfying the government's needs for specific outputs. Their budgets were typically soft, and their firms typically provided a large amount of social welfare outputs. The end result has been that industry leadership had gravitated towards production engineers and away from market oriented entrepreneurs.[5] Similarly, years of apartheid combined with over two decades of international embargo had accustomed South African managers to focus on the needs of the State. Budgets tended to be soft, and were routinely supplemented by government largess.[6] Competitive market conditions had very little relevance to managerial success. This became even truer when the international embargo forced South Africa into self-reliance across the board.

As a consequence of being thrust into the world competitive environment, South Africa's managers could no longer succeed when applying the same sets of incentives and behavioral patterns to which they had become accustomed. Internationally, South Africa had been able to maintain a strong position by focusing on the intra-regional trade areas of SADC and Southern African Customs Union (SACU). In these markets, South Africa enjoyed a position of natural monopoly and did quite well. However, it was generally understood in South Africa that in order to survive in today's international environment of rapid globalization, it could not rely on such protected markets. 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.[7] Given this situation and the speed at which globalization is growing, South Africa needs to focus on the major industrial (i.e., OECD) markets.

A recurring theme in the discussion of the reasons for Sub-Sahara Africa's relative sluggish performance in world markets emphasizes the distorting influences of marketing boards and official government pricing policies, which tended to shield producers from world price signals.[8] There is a broad consensus in the literature that this absence of producer responsiveness to international price changes systematically and critically damaged Sub Sahara's growth prospects for many years. It is in this context that we examine South Africa's international price responsiveness, both at the aggregate, and at detailed product and sector levels. Once we net out those cases in which external factors such as shifting international

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[4] Nordas, H.K, 1996, pp. 723.

[5] See Simeon Djankov and Peter Murrell, 2002, pp. 739-792.

[6] This was generally true not only in the White sectors, but also in the "Homeland" regions, such as Transkei.

[7] For a similar argument in South America, see Yeats, A. J 1998, p 10.

[8] e.g. Bevan, Peter, Collier, Paul and Willem, 1993; and Kumaresan, G. and Suresh, C. Babu, 2001, pp. 93-105.

terms of trade or cyclical fluctuations in major markets, we identify the degree to which domestic entrepreneurial failure may be blamed for observed lack of international competitiveness.

## 1.2. Theoretical Background

Recent research concludes that the industrial composition and direction taken by South African development is counterproductive and hinders its economic growth. The fragmentation into sub-economic sectors, such as street vending, does not allow for the financial cushioning required for flexible responsiveness to changing economic conditions. [9] This new area of study is consistent with the older marketing-board literature, suggesting that price-responsiveness flexibility is indeed a critical element for entrepreneurship. *The underlying factor in Drucker's definition of true entrepreneurship [is] the ability... to act on a creative idea of true innovation. Flexibility means the entrepreneur can indeed take any action or change any course that he himself has set.*[10]

An important macroeconomic area of international price responsiveness is associated with changing exchange rates in potential markets. In this paper, we will focus on this particular manifestation of price flexibility, realizing that there are many other relevant dimensions to this important issue. Theoretically, volatility in exchange rates will affect the volume of trade flow between countries, via the changes in a country's bilateral or relative terms of trade.[11] In particular, a country that is "in tune" with world trade and financial forces, and whose foreign sector is liberalized and profit oriented, will tend to expand the exports to those markets in which relative unit profitability is growing. In such countries, it follows that we should expect to find exports growing more rapidly to those trade partners whose exchange rates are weakening relative to those of other major markets' exchange rates.

This is illustrated in the following example. Let us assume that US $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, the same machine will now yield a higher profit to the South African exporter if exported to the US. 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.[12]

Although it is true that the relationship between export variables and exchange rates is relatively complex, and presumably may include a potential feedback mechanism from export volumes to exchange rates, this does not apply to our specific case. It is not reasonable to expect that the relative exchange rates of the major industrialized OECD countries (U.S., EU, and Japan) could be appreciably affected by any shifts in South African manufactured exports.

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[9] Mahadea, 2002, page 631.

[10] Drucker, Peter 1985, p 210.

[11] e.g. Afriyie and Kundu (1994). The figures used in this paper are based on official exchange rate. For a treatment of black dollar exchange rate in developing countries, including South Africa, see Shachmurove (1999).

[12] We will make the conventional assumption amply buttressed by empirical studies that the Marshal-Lerner conditions on international demand elasticities are satisfied.

Changes in relative exchange rates have been amply demonstrated to result in such "logical" changes in export volumes of major OECD trading countries.[13] We examine below whether the changes in the destination of South Africa's major manufactured exports have been rationally consistent with movements in relative exchange rates.

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. [14] Below, we identify those product groups in which South African exporters demonstrated (or failed to demonstrate) flexible targeting in the face of changing relative market exchange rates. Following our argument, such revealed sectoral flexibility would identify the presence of entrepreneurial potential, and hence reveal likely areas of future competitive success in the international marketplace. As noted above, such price-responsiveness flexibility often determines success or failure in the international arena.[15]

The Constant Market Share (CMS) model, an important managerial tool in the area of international trade, is discussed in Section 3.2 below. As noted, success in the modern competitive environment requires entrepreneurial 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 grew faster than the total import growth rate in the "world", or market. This empirical model is used to assess South Africa's export performance in total, and various subsets of manufacturing exports. The relationship between the international exchange rate flexibility with the revealed CMS international competitiveness is examined in the third section.

## 2. Hypothesis

Our working hypothesis is that the capacity to react rationally to changing exchange rate patterns (facing South Africa's exporters) will be found to be associated with positive CMS *competitiveness effects*. That is, products characterized by positive competitiveness effects will be found to also be relatively more sensitive to changes in relative destination-market exchange rates.[16]

## 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.[17]

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[13] e.g. Wassink, D. and Carbaugh,R.:, 1989, pp. 1078.
[14] Afriyie, K. and Kundu, S 1994.
[15] Simeon Djankov and Peter Murrell (2002) *et al.*, page 745.
[16] E.g. Chow, P, Kellman,M and Shachmurove,Y. (1999).
[17] The SAS computer programs used are available upon request from the authors.

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

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 entrepreneurial responsiveness and flexibility would be inferred from a statistically significant positive coefficient. 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) Model

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,[18] first used in regional economics by Creamer (1943). This model identifies the underlying causes of the extent by which the growth in a country's exports differs from the world, or reference market's average.

The difference between the export growth implied by the constant-share norm and the actual export performance is 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[19]. The measurement is done in stages. At the first stage, exports may be viewed as a single good destined for one market[20]. This is called the 'world trade effect' and is presented in the following form:

$$\sum_{i=1}^{n} rX_i \qquad [1]$$

where, '$X_i$' is the export of the 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 *world trade effect* indicates the growth in exports that would

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[18] Merkies, A.H.Q.M., and van der Meer, T1988, p 66.
[19] Tiwari, R. S 1983, pp 70-71.

[20] Leamer, E., and Stern, R., 1970, p. 16.

have been needed for *reference* reporting country (South Africa in this case) to have maintained a constant share in its (OECD) markets of manufactured imports.

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

$$\sum_{i=1}^{n}(r_iX_i - rX_i) \qquad [2]$$

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. A positive sign indicates that the export country had concentrated on export commodities whose markets were growing relatively fast.[21]

In the third stage, the export growth of the country is then disaggregated into the *market distribution effect,* defined as:

$$\sum_{i=1}^{n}\sum_{j=1}^{m} r_{ij}\ X_{ij} - \sum_{i=1}^{n} r_iX_i \qquad [3]$$

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 indicates the ability of the *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 relatively stagnant markets.

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

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

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:

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

where the terms in parentheses are the actual change in the exports from the base year to the terminal year.

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[21] Ibid., p 18.

Since the external, demand factors of *commodity* and *market effects* are already 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."[22]

In short, the *competitiveness effect* indicates the extent to which a country is able to gain international market shares despite potentially adverse world demand conditions, in terms of both market and commodity. Therefore, it is often interpreted as indicating dynamic entrepreneurial ability of a country to respond to changing environments and adapts its supply situation to world conditions[23]. 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 exports due to a decline in competitiveness. In this paper, we focus on the changes in this *competitiveness effect* over time, and its relationship to explicit international price (exchange rate) shifts in the major markets.

## 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. The database contains exports from South Africa and from eight major OECD countries (the original E.E.C. including UK) plus the U.S. and Japan; as well as corresponding imports to the same countries and to "the World" for the years 1992 through 1999.

Each year's data includes, in thousands of U.S. dollars, values for 101 manufactured traded commodities, ranging from the Standard International Trade Classification (SITC, Rev 1) categories 5 through 8. The advantage of using Rev. 1 is that it 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, which are extracted from the International Monetary Fund's *International Financial Statistics* database.

## 5. The Empirical Model and Results

This section presents the results of empirical estimations of a simple bivariate model testing for the presence and 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 next section examines the internal versus external explanations of South Africa's export performance relative to the growth of its markets during this period. Finally, the interaction between these two approaches is analyzed. Using a representative case, 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.

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[22] Fleming, J. and Tsiang, S. C1956, p 231.

[23] Chow, P., and Kellman, M. H, 1993, p 103.

## 5.1 Exchange Rate Responsiveness

The following equation was estimated for the years 1992 through 1999:

$$Ratio\ of\ S.A.\ Exports_{ij} = \beta_0 + \beta_1 * Exchange\ rate_{ij} \qquad [6]$$

where i and j represent two industrialized country markets for South Africa's manufactured exports. These are all of the 2-country combinations of Western Europe, the United States, and Japan.

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

The following are the estimated regression results:

**Table 1**
**Regression Results –All Manufactures U.S. - Europe**
**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 $\beta_1 = 0.39229$. 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 react "rationally" by increasing its proportion of manufactured exports to the market whose currency 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:

**Table 2**
**Regression Results –All Manufactures U.S. - Japan**
**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:

**Table 3**
**Regression Results –All Manufactures Japan - Europe**
**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 $ß_1$ 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 not statistically significant. At most, it may be stated that this result does not contradict the inference that South Africa's exports to Japan and Europe reacted rationally to changes in the respective market exchange rates.

## 5.2 A Product-Group Level 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 supply responses to exchange rate changes from one to another of the industrialized markets. In order to fully understand the implications of the findings in the three tables above, we must ask to what extent was the price-responsiveness observed (for all manufactured exports) representative of export behavior within detailed product groups. If it is, it would infer the widespread existence of entrepreneurial flexibility throughout the South African manufactured economy. We test this by estimating the same (equation [2.1]) model for each of the individual product groups identified in IDC South African data by Nordas.[24]

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[24] Ibid., p 731.

**Table 4**
**The Estimated Slope Coefficients From Regressing**
**U.S. / Japan Export Market Ratios on Exchange Rates**
**By Detailed Product – Groups**

| Product Group | $ß_1$ (and p-value) | adj $R^2$ |
|---|---|---|
| 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 which the probability (or p) value is greater than .05 is not statistically significant, it is clear from the above that very little significant (exchange-rate) price responsiveness was observable at the product-group, or sector level. Only one sector was 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.

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, one may conclude that the significant reaction that was found for all-manufactured exports primarily reflected market reorientation or targeting shifts of a relatively few specialized product groups, and were not widespread or representative of the South African manufactured export sector as a whole.

### 5.2.1 CMS Analysis of South Africa's Export Growth

During the past decade, South African exports grew less rapidly than global trade. The findings in Table 4 above clearly indicate that flexible price-responsiveness was not typical and widespread within the South African economy, but rather endemic to limited subsets within the manufactured export sector. These facts support the hypothesis that the poor export performance is associated with a lack of widespread entrepreneurial behavior within the South African economy. However, this may be an unwarranted logical leap. It is possible that the poor export performance is primarily due to poor demand conditions, associated with such factors as recessions or gluts in OECD markets. In order to be able to make such an assertion, we must study this issue in more detail, taking into account external demand factors and isolating the supply factors endemic to the South African economy.

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 that it does not reflect external market forces outside the control of South African behavior or policy. Therefore, a negative *competitiveness effect* may be interpreted as stating that "the fault is not in our stars but in ourselves". On the other hand, a positive sign for this effect would signal an entrepreneurial ability to capture competitiveness gains in the face of adverse external economic environments.

Admittedly, the CMS model cannot fully identify which policies or practices might have caused a negative competitiveness result. 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?

Is there some way we might be able to further focus on the last supposition in the previous paragraph? Suppose we could identify a product-sector in which entrepreneurial flexibility is *ipso facto* likely to be relatively present; which demonstrated a positive entrepreneurial "rational" export responsiveness to inter-market exchange rate changes (Table 4 above); and which furthermore succeeded in increasing its international market share. In such a case, the CMS model could indeed be used to shed light on this issue. Presumably, if the lack of flexibility vis a vis exchange-rates is in fact an important explainer of South African export market share losses, then we should expect to find a small (proportional) negative, or perhaps even a positive competitiveness impact for such a product-subset.

A glance at Table 4 reveals only three product groups with significantly (at 10% Alpha) positive," rational" betas – the *Median-Wage*, *Scale-Intensive*, and *Science Based Products.*[25] The first of these three, defined at the wage-level dimension, widely overlaps the others. The second represents a large and very heterogeneous set of products. According to Nordas' Table 2, the *Science-Intensive* product group constituted a full third of all manufactures in South Africa in 1990. Not only is this not a well-defined group, but there is no presumption of any relatively large presence of entrepreneurs within it. However, the third product group, *Science Based Products*, is relatively homogeneous, in that it represents the "new or high" technology sectors, and includes primarily aerospace products, computers, pharmaceuticals and scientific instruments. Moreover, it is likely that this relatively "modern" sector is relatively well endowed with entrepreneurship. The CMS results for this product- group are found below:

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[25] This product group, consisting of SITC products 734 714 541 726 and 861 was found to have statistically significant exchange-rate responsiveness for exports to Europe and the United States. We chose this product group since Europe consists of the traditional and largest OECD market for South African manufactured exports, and the U.S. is the main "new" OECD market.

**Table 5**
**Constant Market Share Effects –Science Based Exports 1992-1999**

| Period | Actual Change | World Trend Effect | Commodity Effect | Market Effect | Competitive Effect |
|---|---|---|---|---|---|
| | | | | ($Millions) | |
| 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 dollar figures South Africa's exports of this category of manufactures were clearly not very impressive, the results summarized in Table 5 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 constant 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.

## 6. Conclusion

This paper analyzes the international trade impact of entrepreneurial talents within the South African economy. We cite extensive literature references concerning the likely effects on African trade and growth of the presence, or lack thereof, of an effective group of price-responsive, market-oriented entrepreneurs. A set of detailed product-group regressions fails to find "rational" flexible exchange-rate price response patterns as representative of the broad or overall export sector. A detailed product-group CMS analysis of the trade performance of a key product-group rejects the hypothesis that the poor performance might be due to external, international - demand factors. It further supports the argument that entrepreneurial presence is likely to be a key explainer of relative export success at the sectoral level of manufactures in South Africa.

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