Title of Paper: Small Island Developing States: Trade Patterns, Determinants and Performance

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Abstract:

In this study, we are concerned with trade patterns and performances of such small islands – more precisely Small Island Developing States (SIDS). Understanding the trade patterns of SIDS is very important in devising trade oriented strategies that will promote their sustainable development. The main objectives of this paper are to assess the changes in patterns of trade of selected SIDS, to assess trade performance and to determine factors that explain trade patterns and the importance of those factors. To get a deeper insight in the exports structure of SIDS, we compute the Diversification Index, Export Diversification Index (EDI), Export Similarity Index (ESI), Revealed Comparative Advantage (RCA) and the Lafay Index. We finally use regression analysis (gravity approach) to understand the determinants of SIDS trade flows.

JEL Classification: F1, F10, F14

Keywords: Trade Indices, SIDS, Gravity Approach, RCA, Lafay Index

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1. INTRODUCTION

This study is meant to contribute to the recently started debate related to small states, their problems and their competitiveness on the international trading market. The definition for small state given by the Commonwealth Secretariat[1] and which has become generally acceptable is a country having a population of less than 1.5 million. These islands, on their own have different interrelated problems. In general, these islands experience specific problems arising from the interplay of such factors as their smallness, remoteness, geographical dispersion, vulnerability to natural disasters, fragility of their ecosystems, constraint on transport and communication, isolation from markets, vulnerability to exogenous economic and financial shocks, small domestic market, lack of natural resources, limited fresh water supply, dependence on imports……; in fact a long and possibly never ending list.

In this study, we are concerned with trade patterns and performances of such small islands – more precisely Small Island Developing States (SIDS). Understanding the trade patterns of SIDS is very important in devising trade oriented strategies that will promote their sustainable development. The United Nations Division for Sustainable development recognizes 51 countries[2] as SIDS. 6 countries out of the 51 SIDS countries do not match the Commonwealth Secretariat definition for small islands. They are Cuba, Dominican Republic, Haiti, Jamaica, Puerto Rico and Papua New Guinea. Depending on data availability, this study is based on 18 SIDS countries. Among the 18 countries, 4 are from

Africa, 4 from Asia and Pacific, 10 from Latin America and the Caribbean[3]. The smallest countries in terms of population have been left out, due to data unavailability.

The main objectives of this paper are:

1. Assessing of the changes in patterns of trade of selected SIDS,
2. assessing trade performance of selected SIDS and
3. Determining factors that explain trade patterns and the importance of those factors. .

In this study, we calculate the share of imports by different markets – Africa, Europe, USA and Asia - from each SIDS under review[4]. This analysis is carried out for three different years, 1990, 1995 and 2002 to show evolution of share of imports into to these regions. The share of imports from SIDS countries into the four regions and even into the world as a whole is negligible; at the most some SIDS have a share of 0.1 % exports into the world market. We use the intra industry trade (IIT) analysis to demonstrate that trade in similar product categories between SIDS and the world is still at a low level, although becoming more intense.

We compute two trade performance indices reflecting structural change for the SIDS, namely the Lawrence Index and the Beneficial Index. The Lawrence index indicates that there has been significant structural change in the export patterns of Bahamas, Seychelles, Belize and Haiti during the period 1985-2003. The Beneficial Index shows that the exports of Dominican Republic, Haiti and Surinam have been somewhat oriented to the most dynamic product sectors in the world market during the period under analysis.

We also compute the following indices to get a deeper insight in the exports structure of SIDS:

1. Diversification Index
2. Export Diversification Index (EDI),
3. Export Similarity Index (ESI)
4. Revealed Comparative Advantage (RCA) and
5. Lafay Index

We finally use regression analysis (gravity approach) to understand the determinants of SIDS trade flows.

The rest of the paper is organized as follows: section 2 analyses patterns of trade for SIDS and section 3 deals with trade performance of the countries. In section 4 we determine the main factors affecting SIDS trade flows using a gravity approach and finally section 5 concludes the study.

2. PATTERNS OF TRADE

Table 1 shows the share of exports of each SIDS as a percentage of its total exports to different regions of the world. Europe and USA are the main markets to which most SIDS exports are channeled and to a lesser extent the Asian market. A common trend to note is that SIDS in the African region tends to export mainly to Europe, while SIDS in Asia and Pacific has as there main market the Asian market and SIDS in Latin America and the Caribbean exports mainly to USA. Apart from SIDS in Africa, it seems that

proximity plays an important for exports. For African SIDS, the trade preferences granted by EU (Lomé, Cotonou, EBA) probably attracts much of their exports. It would be interesting to know the share which imports from these SIDS represent in the overall imports of the main markets and this information is provided in table 2. The shares they represent are negligible in those markets. At the most some SIDS has a share of 0.1% in the total imports of those regions. This is a pretty alarming situation but also suggest that there exist markets which they can penetrate.

[Insert Table 1]

[Insert Table 2]

Patterns of trade are usually divided into two categories namely inter-industry trade and intra-industry trade. Traditional theory of trade based on theory of comparative advantage lead by Ricardo and Hecksher and Ohlin can't predict trade structures in today's world. To them, factor endowments push countries to specialise in the production of those goods for which the production process uses the factors that they possess in abundance and to trade these goods in exchange of those that they do not produce or could produce but only at a higher cost than their trading partners. To the extent that trade takes place between developed and developing countries, their theory could be useful in explaining inter-industry trade. However, much of the developed countries have similar economic structures and factors endowments and the same applies to developing countries. Thus the traditional theory of trade cannot explain the increasing level of trade between developed countries nor can it explain the increasing level of trade between developing

countries. In reaction to this phenomenon was the introduction of imperfect competition on either demand side or supply side in new trade theories.

Intra-industry trade is explained by the love of variety on the demand side and economies of scale on the supply side. The expansion of intra-industry trade is the result of product differentiation in markets with monopolistic competition and increasing returns to scale. By intra-industry trade (IIT) is meant two-way exchange between nations of related products. That is two-way exchange of products with a great similarity of factor intensities in the production process.

The most widely used indicator for IIT is the Grubel-Lloyd index and is calculated as follows:

$$IIT_i = \frac{\left[\left(X_{ij} + M_{ij}\right) - \left|X_{ij} - M_{ij}\right|\right]}{\left(X_{ij} + M_{ij}\right)} \qquad (1)$$

where

X_{ij} is export of industry *i* of country *j*

M_{ij} is import of industry *i* of country *j*

$|X_{ij} - M_{ij}|$ is net trade

$X_{ij} + M_{ij}$ is total trade

$i = 1,2,\ldots n.$

If, instead for an individual product category, the index is calculated for the whole economy, then it is the weighted average of the product group indices according to the weight of the product groups in foreign trade.

$$IIT = W_i * IIT_i, \text{ or} \qquad (2)$$

$$GL_i = \frac{\sum_{i=1}^{n}(X_i + M_i) - \sum_{i=1}^{n}|X_i - M_i|}{\sum_{i=1}^{n}(X_i + M_i)} * 100 \qquad (3)$$

Where

GL_i is the Grubel-Lloyd index of IIT

X_i is export of industry i

M_i is import of industry i.

The value of the index varies between 0 and 100. 0 indicates complete inter-industry trade. Higher values of the index are correlated with greater intra-industry trade as a proportion of total trade. The more disaggregated the level of data classification, the better will be the calculated result for IIT. In this study we calculate IIT (GL Index) for each SIDS. We use data at 4 digit SITC level for three different years, 1980, 1990 and 2002. The results are shown in Table 3.

[Insert Table 3]

The results suggest that the degree of intra industry trade between SIDS and the world is low and intra industry trade is not increasing. In fact, for some SIDS there has been a

decline in intra industry trade during the period under study. Among the countries under study, Bahamas, Dominica Republic and Haiti experience the highest intra industry trade.

When trade is imbalanced, this indicator becomes slightly biased. By definition, this indicator displays trade imbalance as part of inter-industry trade and trade overlap as intra-industry trade. So, two distinct theoretical concepts are used to explain the same flow. Moreover, this measure highlights the intensity of overlap in trade without distinguishing the patterns of trade. As an improvement to this measure, Abd-El-Rahman (1986) came out with a different concept of intra-industry trade which was later refined by Fontangne and Freudenberg (1997). They proposed a method which distinguishes a flow as one-way or two-way trade. If the level of trade is essentially based on one-way trade, then trade is classified as inter industry trade, otherwise trade is classified as intra-industry trade. Once a trade flow is classified as being a two-way trade, it can further be refined as horizontally or vertically differentiated which leads to the concept of horizontal IIT and vertical IIT respectively.

If the value of the minority flows over that of majority flow is less than 10%, then trade in an item is considered to be one-way trade. Mathematically, it is represented as follows:

$$\frac{Min\left(X_{ij,kt}, M_{ij,kt}\right)}{Max\left(X_{ij,kt}, M_{ij,kt}\right)} < 10\ \% \qquad (4)$$

In this study we compute the share of one-way and two-way trade for trade between each SIDS and the world for the year 2002. The results are shown in table 4. The results show that few countries (Dominican Republic and Barbados) experience high level of two way trade with the world. There are quite a few more countries – Mauritius, Seychelles, Belize and Haiti which experiences at least 25 % trade with the world as two way trades.

[Insert table 4]

3. TRADE PERFORMANCE

In an attempt to assess trade performance for SIDS, we compute several indices to understand the nature of exports of SIDS. We try to understand the extent to which these countries have a diversified exports structure suing an index of export diversification; we measure the importance of a country's exports of a particular product in its total exports relative to world exports of that product to the world market, using the Revealed Comparative Advantage (RCA) technique; we assess the degree of export similarity of these SIDS using the Export Similarity Index (ESI), we compute two trade performance indices reflecting structural change for each SIDS –namely the Lawrence Index and the Beneficial Index and finally we compute the Lafay Index of international specialisation. The time period for these assessments is 1985 to 2003.

The index of export diversification is defined as follows:

$$DIV = 1/ \sum_{i=1}^{n} (x_{i,t} / x_t)^2 \qquad (5)$$

Where, $\chi_{i,t}$ refers to exports of product *i* in year *t* and χ_t refers to total national exports in year *t*. The higher is the value of the index, the higher the degree of diversification. The results are shown in table 5.

[Insert Table 5]

SIDS fall into three groups: countries that have diversified over the years, countries with a more or less stable diversification index and countries that have recorded a downward trend of their export diversification. Comoros, Guinea-Bissau and Surinam have recorded a constant diversification over the period of study. Seychelles and Haiti have recorded a downward trend. It should be noted that Haiti was one of the most diversified countries over the first period. Mauritius, Bahamas, Barbados, Belize, Cuba, Dominican Republic, Guyana and Trinidad and Tobago have recorded an upward trend in export diversification with Dominican Republic recording the highest export diversification in the last period.

The export similarity index we use in this study is the one proposed by Linnemann and Beers (1988) which is derived form the export similarity index developed by Finger and Kreinin (1979). The index of export similarity measures the similarity of exports of any two countries (or group of countries) to a third market (or the world market). Assessing the export similarity overtime shed light on whether member countries are becoming more similar or dissimilar as far as exports structure is concerned.

The export similarity index (ESI) is defined as follows:

$$ESI_{mj} = \sum_i MIN\left(X_{im} / X_m , X_{ij} / X_j \right) \quad (6)$$

Where X_{im} is product *i's* export of country *m*

X_m is the total export of clothing by country *m*.

The ESI in a certain market selects the smaller value from the weight of a product *i* among the total exports of a country, between 2 countries and adds the value of all products. The ESI can range from zero to unity. If the two countries' trade patterns differ completely ($ESI_{ij} = 0$), there is no trade between the two countries under review because the potential trading partner has no demand for any of the goods offered by a certain country[5]. As ESI approaches 1, the Exports Structure of both countries are more similarly made and may be considered to be in competition with each other on the world market. We present results of our calculation for 2003 in table 6[6].

[Insert table 6]

Jamaica and Surinam have always been competitors on the world market. Mauritius and Haiti and Dominican Republic and Haiti are also competitors on the world market, but to a lesser extent. To set the scene, consider the share of exports at SITC 1 digit product level for these countries given in table 7. Jamaica and Surinam both exports a share of more than 58 % of their total exports in crude materials (SITC 2) and more than 17 % food and live animals (SITC 0). Mauritius, Dominican Rep and Haiti all have a share of exports of more than 60 % in miscellaneous manufactured goods (SITC 8)

[Insert Table 7]

The technique of revealed comparative advantage (RCA) the extent to which a country exports more of a product than the average country. It is used to measure the importance of a country's exports of a particular product in its total exports relative to world exports of that product to the world market. In order to measure the RCA of a country in a certain product category, we compare the share of that product category in that country's exports to the share of that product category in overall world exports. Thus this measure captures the extent to which a country exports more of a product than the average country.

The RCA is algebraically defined as follows:

$$RCA = (X_{ij} / X_j) / (X_{iw} / X_w), \quad (7)$$

Where X_{ij} = export of *i-th* product from country *j*

X_j = total exports from country *j*

X_{iw} = export of *i-th* product from the world

X_w = total export from the world.

An RCA index above unity indicates that the share of product i in country j's exports is greater than the share of product i in overall world exports, suggesting that the country has a comparative advantage in the production of that good. An RCA index below unity denotes relative disadvantage. We compute RCA index for SIDS for the years 1980, 1985, 1990, 1995, 2000, 2002 and 2003. We report results for each SIDS for 1985 and 2002 in table 8[7]. According to our results, out of 629 product categories, Dominican

Republic had the highest number of products with a revealed comparative advantage in both 1985 and 2002, 62 and 65 respectively. In 2002, Belize had the lowest number of products with a revealed comparative advantage.

[Insert Table 8]

The notion of revealed comparative advantage is divided into 3 distinct types, namely declining comparative advantage, emerging comparative advantage and continuing comparative advantage. Declining comparative advantage means that at the start of the period under analysis the country had a comparative advantage in those products but it lost its comparative advantage over the years. Emerging comparative advantage means that at the beginning it did not have a comparative advantage in those products but has gradually raised their RCA's to unity. Continuing comparative advantage means that the RCA index is above unity throughout the period of study, but over the years the degree of comparative advantage may have increased or fallen. Table 9 shows the number of products lines during the period 1980-2003 with continuing, declining and emerging comparative advantage. There are a number of countries which have less emerging comparative advantage than declining comparative advantage, namely Seychelles, Barbados, Belize, Cuba, Haiti, Jamaica and Surinam.

[Insert Table 9]

The Lawrence index gives an index value that ranges from zero to one, and the index indicates a complete upheaval if it is close to unity, otherwise indicates little change if it is close to zero. The Lawrence Index is calculated as follows:

$$L = (1/2) \sum_{i=1}^{n} | s_{i,t} - s_{i,t-1} |, \text{ where } s_{i,t} = x_{i,t} \Big/ \sum_{i} x_{i,t} , \quad (8)$$

Where $x_{i,t}$ is the share of sector *i*'s exports in total exports of the SIDS in year *t*.

[Insert Table 10]

Bahamas, Seychelles, Belize and Haiti experienced significant structural change in the export patterns of these countries during the period under study. To set the scene, table 11 shows the share of exports of each of the four countries both in the year 1985 and 2003. There is indeed a significant change in export patters of these countries. The share of exports of minerals (SITC 3) for Seychelles in 1985 was 80.3 %and this has been reduced to 18.4 % in 2003 and the largest share of exports come from food and animal products (SITC 0). Bahamas which also concentrated exports in minerals in the year 1985 has in 2003 diversified its exports. Minerals, which accounted for 88.3 % of exports in 1985, accounted for only 35.4 % in 2003.

[Insert Table 11]

The Beneficial Index is used to measure whether a given structural change in export pattern is oriented to the most dynamic products demanded by the world. A positive value indicates a beneficial orientation, and that the structural change in exports favoured the dynamic sectors. The Beneficial Structural Change Index (BSCI) is defined as follows:

$$BSCI = \sum_{i=1}^{n} \left\{ \left[\frac{x_{i,t} / \sum_i x_{i,t-1}}{x_{i,t-1} / \sum_i x_{i,t-1}} - 1 \right] * \left[\frac{\left(M_{i,t} / M_{i,t-1} \right)^{"world"}}{Average \left(M_{i,t} / M_{i,t-1} \right)} - 1 \right] * \left(\frac{x_{i,t}}{\sum_i x_{i,t}} \right) \right\} \quad (9)$$

As seen from table 9, the Beneficial Index also suggests that structural change for some countries are geared towards the most dynamic products demanded by the world. In particular, these countries are Dominican Republic, Haiti, Surinam and Bahamas.

Zaghini (2003) argues that the Lafay Index of international specialization in a given sector, by taking into account imports, allows to control for intra-industry trade and re-export flows and in this sense is a better indicator than the RCA Index (Balassa, 1965) and the BSCI (Bender, 2001). Since comparative advantages are structural, by definition, it is crucial to eliminate the influence of cyclical factors, which can affect the magnitude of trade flows in the short run. The Lafay index takes into accounts these effects by considering the difference between each item's normalized trade balance and the overall normalized trade balance. The Lafay index also weighs each product's contribution according to the respective importance in tarde. The Lafay index is algebraically defined as follows:

$$LFI^{i}_{j} = 100 \left(\frac{X^{i}_{j} - M^{i}_{j}}{X^{i}_{j} + M^{i}_{j}} - \frac{\sum_{j=1}^{n} \left(X^{i}_{j} - M^{i}_{j} \right)}{\sum_{j=1}^{n} \left(X^{i}_{j} + M^{i}_{j} \right)} \right) \frac{X^{i}_{j} + M^{i}_{j}}{\sum_{j=1}^{n} \left(X^{i}_{j} + M^{i}_{j} \right)} \quad (10)$$

Where X^i_j and M^i_j are exports and imports of product j of country i, towards and from the rest of the world, respectively and n is the number of items. Thus, the comparative advantage of of country i in the production of item j is measured by the deviation of product j normalized trade balance from the overall normalized trade balance, multiplied by the share of trade of product j of total trade. A positive value of the index indicate the existence of comparative advantages in a given item; the larger the value the higher the degree of specialization. On the contrary, negative values points to de-specialization.

We compute the Lafay index for each SIDS taking a 3 year average (2000-2003) rather than a single year data to make analysis more realistic and deal with the problem of erratic data, if any. Table 12 displays for each country the three items of top specialization.

[Insert Table 12]

Haiti and Dominican Republic are the only two countries for which all the three items belong to manufactures, with Haiti showing a degree of specialization only in garments. Products within the food and live animals category (SITC 0) appear as one of the first three items of specialization for almost all SIDS. THE Lafay index for the product with the highest degree of specialization and its share of export in total exports of the SIDS is given in column 2 of table 12. The share of exports are very high for most countries meaning that a high degree of specialization in a few products

4. DETERMINATS OF SIDS TRADE FLOWS: A GRAVITY EQUATION APPROACH

The gravity model is the key econometric technique most widely used in order to examine the determinants of bilateral trade flows. In its most basic form, the gravity model explains the level of exports by several variables, the most important ones being size of an economy and distance between trading partners. In fact, trade between two countries is positively related to the size of the partner country and inversely related to the distance between them. Distance is used as a proxy for transport cost. In practice, this basic form is augmented using other variables that directly or indirectly explain trade. For instance, real exchange rate and population size of the involved countries.

In this study, we use a panel data analysis to estimate export flows from 17[8] SIDS exporting countries to 125 importing countries for a period of 21 years (1980-2001)[9]. The reduced form of an augmented gravity model used in this study is as follows:

$$Ln\ X_{ijt}^{10} = a + \beta_1 Ln\ GDP_{it}^{11} + \beta_2 Ln\ GDP_{jt} + \beta_3 Ln\ POP_{it} + \beta_4 Ln\ POP_{jt} + \beta_5 Ln\ RER_{ijt} + \beta_6 Ln\ DIST_{ij} + \beta_7 BORD_{ij} + \beta_8 LANG_{ij} + \varepsilon_{ijt}. \quad (11)$$

Where

Ln is natural logarithmic transformation

X_{ijt} is the value of exports from country i to country j in year t. we use exports as the dependant variable, rather than total bilateral trade because it permits to identify export and import diversion separately.

GDP_{it} is GDP of the exporting country in year t

GDP_{jt} is GDP of the importing country in year t

POP_{it} is population size of the exporting country in year t

POP_{jt} is population size of the importing country in year t

RER_{ijt} is the bilateral exchange rate between country i and country j in year t.

$DIST_{ij}$ is the distance between the capital cities of country i and country j

$BORD_{ij}$ is a dummy that takes the value of 1 if country i and country j share a common border; 0 otherwise.

$LANG_{ij}$ is a dummy that takes a value of 1 if country i and country j have the same first language; 0 otherwise.

The size of economies, GDP and population size, act as a proxy measure for the level of demand in the importing country and level of supply in the exporting country. A high output (GDP) level in the exporting and importing countries provides a higher export potential for the countries. Therefore we expect export of country *i* to vary positively with the size of GDP of both importing and exporting countries. Trade is negatively related to the level of population indicating that large countries tend to be more self-sufficient. Trade is negatively related to distance for the following two reasons: first, the larger the distance between two countries, the higher the transportation costs. Secondly, the larger the distance, the more time involved in delivering the goods and concerns about possibilities for goods to perish. Bilateral trade is positively related to countries sharing a common border and language familiarity.

In estimating our equation, we used a Tobit model with fixed effects. Fixed effects and random effects are alternative ways of accounting for unobserved heterogeneity. The

random effects requires that the unobserved effects be uncorrelated with the included explanatory variable. The fixed effect model relaxes this assumption but in a panel context the estimator is inconsistent because the asymptotic variance of the estimator and of the main parameters is a function of the size of the fixed group. Hausman test is a statistical test for testing fixed effects versus random effects. The estimated Hausman test statistic for our regression equation is 184.8 which is more than the critical value at 5 % level (34.5). Thus random effect estimation was rejected and we adopted the fixed effects specification within a Tobit model[12]. The results of the regressions are shown in table 13.

[Insert Table 13]

The coefficients on the observable effects determining bilateral trade are as expected and highly significant except population size of the importing country. Although all the determinants for SIDS exports appears to be important, Distance, Language and GDP of the importing country appears to have a larger influence.

5. CONCLUSION

We discuss trade patterns and performances of such small islands – more precisely Small Island Developing States (SIDS). We used different interrelated trade indicators to explain the products in which each SIDS have export advantages, the degree of their trade concentration, the similarity of products they export, the share of trade decomposed into intra and inter industry trade and finally we showed the main determinants of SIDS exports overtime.

REFERENCES

Adams et al (2003), The trade and investment effects of preferential trading arrangements- old and new evidence. Productivity Commission staff working paper, Canberra May 2003.

Aitken (1973), The effect of the EEC and EFTA on European trade: a temporal cross sectional analysis, American Economic Review 63(5).

Bender, S and Kui-Wai Li, (2002), The Changing Trade and Revealed Comparative Advantages of Asian and Latin American Manufacture Exports, Yale University Economic Growth Centre, Paper No. 843.

Chauvin S and Guillaume G, (2002), Regional Trade Integration in Southern Africa, Centre D'Etudes Prospectives et D'Information Internationales, CEPII, 2002-12.

Dee P and Gali J, (2003), The Trade and Investment Effects of Preferential Trading Arrangements, paper prepared for the fourteenth annual NBER-East Asian Seminar on Economics, Taipei, 2003.

Edwards L and Schoer V, The Structure and Competitiveness of South Africa Trade, University of Cape Town.

Endoh (1999) Trade creation and trade diversion in the EEC, the LAFTA and the CMEA: 1960-1994, Applied Economics, 1999, 31, 207-216.

Finger J and Kreinin M (1979), A Measure of Export Similarity and its possible uses, The Economic Journal, Vol 89 Pp 905-912, 1979

Frankel (1997)Regional trading blocs in the world trading system, Institute for International Economics, Washington DC.

Kosekahyaoglu L, An Analysis of the Similarity Between Exports of Turkey and the EU12.

Linnemann H and Beers V (1988), Measures of Export-Import Similarity, and the Linder Hypothesis once Again, Review of World Economics, Vol 124 Pp 445-457, 1988

Oguledo and Macphee (1994), Gravity models: a reformulation and an application to discriminatory trade arrangements, Applied Economics, 1994, 26, 107-120.

Paas (2000) Gravity approach for modeling trade flows between Estonia and the main trading partners, University of Tartu No 4, 2000.

Rahman (2003) A panel data analysis of Bangladesh's trade: the gravity model approach. University of Sydney, September 11-13 2003.

Sharma and Chua (2000), ASEAN: economic integration and intra-regional trade, Applied Economic Letters, 2000, 7, 165-169.

Sologa and Winters (2001) Regionalism in the nineties: what effect on trade? North American Journal of Economics and Finance, 12(1).

Southern African Update, (2000), Revealed Comparative Advantage in SADC Economies, 2000, Volume 5.

Table 1: Share of SIDS Exports to Different region (%)

	Share of Exports to

	Africa	Europe	USA	Asia	Total
Trinidad Tobago	0.2%	9.1%	55.1%	0.5%	64.8%
Bahrain	4.4%	4.6%	7.9%	25.7%	42.6%
Fiji	0.1%	16.5%	23.6%	11.2%	51.4%
Kiribati	0.5%	6.0%	17.4%	30.7%	54.5%
Papua Nieu Guinea	0.1%	10.1%	2.8%	21.5%	34.5%
Solomon Islands	0.1%	3.3%	0.8%	89.5%	93.7%
Comoros	0.4%	81.9%	8.9%	8.2%	99.5%
Guinea-Bisseau	9.3%	41.7%	2.2%	45.0%	98.2%
Mauritius	7.3%	67.0%	19.8%	4.8%	98.9%
Seychelles	13.7%	69.6%	7.6%	8.5%	99.4%
Bahamas	0.3%	39.7%	36.5%	4.2%	80.7%
Barbados	0.5%	19.3%	15.5%	0.7%	36.1%
Belize	0.0%	31.0%	37.9%	5.6%	74.6%
Cuba	1.7%	25.2%	0.0%	12.8%	39.8%
Dominica Rep	0.3%	8.0%	85.3%	1.3%	94.8%
Guyana	0.1%	25.1%	26.2%	2.8%	54.2%
Haiti	0.1%	4.9%	85.1%	0.4%	90.5%
Jamaica	2.4%	36.8%	29.8%	7.1%	76.0%
Surinam	1.7%	45.9%	25.8%	4.9%	78.4%

Source: Computed from WTA

Table 2: Share of each SIDS exports in the total imports of different regions and the world (%)

	DESTINATION				
	AFRICA	EUROPE	USA	ASIA	WORLD

	1990	1995	2002	1990	1995	2002	1990	1995	2002	1990	1995	2002	1990	1995	2002
Trinidad Tobago	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.2	0.0	0.0	0.0	0.1	0.1	0.1
Bahrain	0.3	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.1
Fiji	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Kiribati	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Papua Nieu Guinea	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0
Solomon Islnds	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Comoros	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Guinea-Bisseau	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mauritius	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Seychelles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bahamas	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Barbados	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Beize	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cuba	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0
Dominica Rep	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4	0.0	0.0	0.0	0.1	0.1	0.1
Guyana	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Haiti	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Jamaica	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Surinam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: Computed from WTA

Table 3: GL Indicator

	1980	**1990**	**2003**
Comores	0.9	2.6	1.7
Guinea-Bisseau	2.8	4.0	6.7
Mauritius	7.0	12.0	20.6

Seychelles	2.7	31.5	19.9
Bahamas	41.0	24.1	33.1
Barbados	25.7	25.5	25.2
Belize	22.1	15.4	14.2
Cuba	4.0	3.1	4.5
Dominican Rep	4.8	32.3	29.3
Guyana	5.9	8.1	8.2
Haiti	29.4	29.4	26.8
Jamaica	5.5	12.5	13.0
Surinam	6.9	4.7	4.6
Trinidad and Toba	10.5	16.9	11.5

Source: Computed from WTA

Table 4: Share of total trade decomposed into one-way and two-way trade[13]

	Share of	
	2-Way Trade	**1-Way trade**
Comores	3.4	96.6
Guinea-Bisseau	8.8	91.2
Mauritius	27.5	72.5
Seychelles	33.0	67.0
Bahamas	42.5	57.5
Barbados	41.6	58.4
Belize	28.8	71.2
Cuba	6.6	93.4
Dominican Rep	48.4	51.6
Guyana	10.1	89.9
Haiti	29.7	70.3
Jamaica	15.0	85.0
Surinam	6.9	93.1
Trinidad and Toba	10.8	89.2

Source: Computed from WTA

Table 5: Export Diversification Index for SIDS 1980-2003

	1980	2003
Comores	2.7	3.0
Guinea-Bisseau	3.3	3.6
Mauritius	2.2	9.1
Seychelles	3.1	1.9
Bahamas	3.7	5.3
Barbados	7.4	11.0
Belize	4.5	5.2
Cuba	3.8	6.5
Dominican Rep	4.2	15.4
Guyana	5.3	7.6
Haiti	11.7	6.0
Jamaica	1.6	3.6
Surinam	2.8	2.6
Trinidad and Toba	3.6	8.4

Source: Computed from WTA

Table 6: Export Similarity Index for SIDS (2003)

	GUINEA	MAURITIUS	SEYCHELLES	BAHAMAS	BARBADOS	BELIZE	CUBA	DOMINICAN REP	GUYANA	HAITI	JAMAICA	SURINAM	TRINIDAD
COMORES	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0
GUINEA		0.2	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.0
MAURITIUS			0.1	0.0	0.2	0.2	0.2	0.3	0.3	**0.4**	0.2	0.0	0.1
SEYCHELLES				0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.1
BAHAMAS					0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
BARBADOS						0.1	0.2	0.1	0.2	0.0	0.2	0.0	0.2
BELIZE							0.3	0.1	0.3	0.1	0.1	0.1	0.0
CUBA								0.1	0.3	0.0	0.2	0.2	0.0
DOMINICAN REP									0.1	**0.4**	0.2	0.1	0.1
GUYANA										0.1	0.2	0.3	0.0
HAITI											0.2	0.1	0.0
JAMAICA												**0.6**	0.1
SURINAM													0.0

Source: Computed from WTA

Table 7: Share of exports of each product category (SITC 1) in total exports for selected SIDS for the year 2002

	Mauritius	Dominican Republic	Haiti	Jamaica	Suriname
0 - Food and live animals	25.7	8.0	7.9	**18.8**	**17.1**

1 - Beverages and tobacco	0.3	6.0	0.3	5.8	0.0
2 - Crude materials,inedible,except fuels	0.7	0.8	0.7	**63.5**	**58.6**
3 - Mineral fuels,lubricants and related materials	0.0	0.0	0.0	2.0	1.2
4 - Animal and vegetable oils,fats and waxes	0.1	0.0	0.0	0.0	0.0
5 - Chemicals and related products,n.e.s.	1.1	1.7	1.9	5.6	0.4
6 - Manufactured goods classified chiefly by material	7.4	7.9	3.9	0.8	0.7
7 - Machinery and transport equipment	3.7	8.5	0.8	0.7	0.7
8 - Miscellaneous manufactured articles	**60.5**	**61.8**	**75.8**	2.9	0.7
9 - Commodities and transactions not elswhere classif.	0.6	5.1	8.7	0.0	20.6

Source: Computed from WTA

Table 8: Revealed Comparative Advantage

	1985	**2002**
Comores	11	23
Guinea-Bisseau	28	25
Mauritius	38	45
Seychelles	17	15
Bahamas	13	34
Barbados	29	50
Belize	40	12
Cuba	57	34
Dominican Rep	**62**	**65**
Guyana	32	36
Haiti	65	34
Jamaica	47	30
Surinam	21	23
Trinidad and	16	40

Toba		

Source: Computed from WTA

Table 9: Continuing, Declining and Emerging Revealed Comparative Advantage (1980-2003)

	Continuing	Declining	Emerging
Comores	2	13	20
Guinea-Bisseau	5	17	24
Mauritius	20	11	33
Seychelles	3	16	6
Bahamas	2	10	23
Barbados	24	34	27
Belize	8	37	9
Cuba	17	19	16
Dominican Rep	17	14	43
Guyana	13	16	26
Haiti	27	35	9
Jamaica	13	16	17
Surinam	7	12	11
Trinidad and Toba	12	4	24

Source: Computed from WTA

Table 10: **Trade Performance Indices**

	BSCI	Lawrence Index
Comores	0.0	0.4
Guinea-Bisseau	0.1	0.6
Mauritius	0.1	0.5
Seychelles	0.0	0.9
Bahamas	1.6	1.0
Barbados	0.1	0.5
Belize	0.2	0.7
Cuba	0.1	0.5
Dominican Rep	9.0	0.6
Guyana	0.2	0.6
Haiti	2.1	0.7
Jamaica	0.0	0.3
Surinam	2.2	0.3
Trinidad and Toba	1.8	0.5

Table 11: share of exports of each product category (SITC 1) in total exports

	Seychelles		Bahamas		Belize		Haiti	
	1985	2003	1985	2003	1985	2003	1985	2003
0 - Food and live animals	6.9	***77.4***	0.8	8.0	***62.0***	***85.1***	17.9	5.7
1 - Beverages and tobacco	0.3	0.4	0.5	***14.1***	1.2	0.0	0.2	0.2
2 - Crude materials,inedible,except fuels	4.2	0.0	0.7	4.9	0.7	1.2	1.6	0.8
3 - Mineral fuels,lubricants and related materials	***80.3***	***18.4***	***88.3***	***35.4***	3.0	0.3	0.0	0.0
4 - Animal and vegetable oils,fats and waxes	0.1	0.0	0.0	0.0	0.2	0.0	0.0	0.0
5 - Chemicals and related products,n.e.s.	0.1	1.2	8.9	7.2	1.2	0.3	1.5	2.1
6 - Manufactured goods classified chiefly by material	0.3	0.0	0.2	0.7	1.2	0.6	10.0	3.0
7 - Machinery and transport equipment	4.2	2.2	0.5	***16.1***	6.9	4.3	***21.6***	1.9
8 - Miscellaneous manufactured articles	3.4	0.3	0.1	5.2	***23.0***	7.8	***44.3***	***78.7***
9 - Commodities and transactions not elswhere classif.	0.1	0.0		8.3	0.6	0.4	2.8	7.6

Source: Calculated from WTA

Table 12: Items of top specialization in SIDS

(Lafay Index of specialization; average 2000-2003)

	1	Share of Exports /(Lafay Index)	2	3
Comores	5513 Essential oils,concretes & absolutes;resinoids	5.7 % (3.4)	0341 Fish,fresh(live/dead)or chilled,excl.fillets	0342 Fish,frozen (excluding fillets)
Guinea-Bisseau	0577 Edible nuts(excl.nuts used for the extract.of oil)	34.2% (13.2)	3330 Petrol.oils & crude oils obt.from bitumin.minerals	0730 Chocolate & other food preptns. containing cocoa

Mauritius	8461 Under garments,knitted or crocheted of wool	22.6% (11.2)	0611 Sugars,beet and cane,raw,solid	8423 Trousers,breeches etc.of textile fabrics
Seychelles	0371 Fish,prepared or preserved,n.e.s. including caviar	61.4% (30.6)	0344 Fish fillets,frozen	8720 Medical instruments and appliances
Bahamas	334X Other: Petroleum products,refined	27.9% (7.2)	1124 Spirits;liqueurs, other spirituous beverages,n.e.s	0360 Crustaceans and molluscs,fresh,chilled,frozen etc.
Barbados	3343 Gas oils	18.9% (4.0)	0611 Sugars,beet and cane,raw,solid	1124 Spirits;liqueurs, other spirituous beverages,n.e.s
Belize	9310 Special transactions & commod.,not class.t	29.2% (9.1)	0611 Sugars,beet and cane,raw,solid	0360 Crustaceans and molluscs,fresh,chilled,frozen etc.
Cuba	0611 Sugars,beet and cane,raw,solid	28.4% (13.2)	2872 Nickel ores and concentrates;nickel mattes etc.	9999 Nonidentified products
Dominican Rep	8423 Trousers,breeches etc.of textile fabrics	14% (4.8)	6716 Ferroalloys	8720 Medical instruments and appliances
Guyana	9710 Gold,nonmonetary	23.9% (11.9)	0611 Sugars,beet and cane,raw,solid	2873 Aluminium ores and concentrates (includ.alumina)
Haiti	8461 Under garments,knitted or crocheted of wool	35.5% (10.2)	8451 Jerseys,pullovers,twinsets,cardigans,knitted	8459 Other outer garments & clothing,knitted
Jamaica	2873 Aluminium ores and concentrates (includ.alumina)	56.7% (24.3)	0611 Sugars,beet and cane,raw,solid	8461 Under garments,knitted or crocheted of wool
Surinam	2873 Aluminium ores and concentrates (includ.alumina)	62.6% (31.1)	9710 Gold,nonmonetary	0360 Crustaceans and molluscs,fresh,chilled,frozen etc.
Trinidad and Toba	3344 Fuel oils,n.e.s.	20.9% (2.2)	3330 Petrol.oils & crude oils obt.from bitumin.minerals	5225 Oth.inorg.bases & metallic oxid.,hydroxid.& perox.

Source: Calculated from WTA

Table 13: Regression Estimates

Variable Name	Estimates
Ln GDP Exporting Country	0.54[14]***
Ln GDP importing Country	0.74***
Ln real Exchange Rate	-0.31***
Ln Distance	-1.37***
Ln Population Exporting Country	-0.23***
Ln Population Importing Country	-0.13
Common Language	0.83***
Common Border	0.54***
Standard deviation of the error term	1.8

Source: Author's estimates

END NOTES

[1] Commonwealth Secretariat 1998, Small States Economic Review and Basic Statistics, Vol 4 December 1998

[2] 6 countries in Africa, 23 in Latin America and the Caribbean and 22 in Asia and the Pacific. For a detail list refer to United Nations for Sustainable development webpage: http://www.un.org/esa/sustdev/sids/sidslist

[3] Comoros, Guinea-Bissau, Mauritius and Seychelles from Africa; Bahrain, Fiji, Papua New Caledonia and Solomon Islands from Asia and the Pacific; The Bahamas, Barbados, Belize, Cuba, Dominican Republic, Guyana, Haiti, Jamaica, Suriname and Trinidad and Tobago from Latin America and Caribbean.

[4] Depending on data availability.

[5] ESI has been used as an explanatory variable in a gravity equation explaining trade patterns by the Deutsche Bundesbank. Refer to Deutsche Bundesbank monthly report October 1999 for a better insight.

[6] Results for 1980, 1985, 1990, 1995 and 2000 can be requested from the author

[7] Results for the other years are available on request from the author

[8] More SIDS exporting countries could have bee included in this analysis. However, for some countries, data for the period under study are not complete. Therefore these countries were left out to avoid data problem and make the study more realistic.

[9] Data sources: GDP and population data obtained from World Development Indicators from World Bank. Bilateral exports data and exchange rate data obtained from IMF DOTS and IFS respectively. Distance,

common border and language data obtained from John Haven's international trade data website: http://www.macalester.edu/research/economics/PAGE/HAVEMAN/Trade.Resources/TradeData.html

[10] Exports for some countries to partners in some or all years may be equal to zero. Very small numbers can be used in the place of zero without loss of generality. Eichegreen and Irverwin (1995), used $\text{Ln}(X_{ijt} + 1)$ as the dependant variable. Soloaga and Winters (2001) used a tobit specification.

[11] Different studies have treated the size variable in terms of GDP for exporting and importing countries differently. Frankel (1997) used GDP of exporting and GDP of importing countries separately. Egger (2000) used sum of importing and exporting countries as an explanatory variable. Bayoumi and Eichengreen (1995) used product of income per person in exporting and importing countries. Adams, dee, Gali and Mc Guire (2003) used sum of bilateral GDPs and absolute difference in GDP per capita

[12] For a discussion about the shortcomings and merits of Tobit model with fixed effects refer to Green (2002) and appendix c in Adams, dee, Gali and Mc Guire (2003)

[13] This ratio has been calculated by finding whether each product line is a one way or two way trade using the formula. Then for each product line showing a two way trade, the sum of imports and exports for that product has been divided by sum of total import and exports for that country with the world.

$$\frac{\sum_{j}^{m} X_j + M_j}{\sum_{i=1}^{n} X_i + M_i}$$ where *j* is the two way trade product line and *i* is any product line

[14] Triple stars denotes significance at 10 % level