INTERNATIONAL TRADE PERFORMANCE OF THE SOUTH AFRICAN FISH INDUSTRY

Yakob MT[1], Viljoen, MF[2] ; Jooste, A[3] and Graz, M[4]

Yakob, MT
University of the Free State
Department of Agricultural Economics
P.O. Box 339
Bloemfontein 9300
South Africa
E-mail: teweldemy.sci@mail.uovs.ac.za
Tel: +27 51 401-321227

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[1] Post graduate student, Department of Agricultural Economics, University of the Free State, South Africa.
[2] Professor, Department of Agricultural Economics, University of the Free State, South Africa.
[3] Associate Professor, Department of Agricultural Economics, University of the Free State, South Africa.
[4] PhD, Marine and Coastal Management, Department of Environmental Affairs and Tourism, South Africa

International trade performance of the South African fish industry

Abstract

In an effort to gain a better understanding of the trade in fish products by South Africa a starting point is examining South Africa's current trade in fish products. Useful tools in this regard are the Gini-coefficient, used to examine the degree of concentration for fish exports, and the intra-industrial trade coefficient (IIT), and used to examine the balance of international fish trade by South Africa. The Gini-coefficient for fish exports shows that fish export by South Africa is highly concentrated. The trend in concentration appears to have remained constant, and therefore the South African fisheries industry may boast a competitive advantage. However, cognisance should be taken of the fact that such a high level of concentration may render the South African fisheries industry vulnerable to exogenous changes. The IIT analysis shows that, after 1985, the fisheries industry underwent substantial changes in that it has increased exportable surpluses, probably as a result of increased specialization and competitiveness.

1. Introduction

In 2000 South Africa harvested between 200 000 and 250 000 tons of round fish (pelagic species) to produce 45 000 to 55 000 tons of fishmeal and 5 000 tons of fish oil at 10 processing plants. Seven canning plants process sardine and tuna. Most of the fish production is sold frozen (57 processing and freezing plants). Exports amounted to about 100 000 tons, valued at USD 558, 3 million in 2000. In 2001 and 2002 the total export was about USD 673, 7 and 348, 34 million respectively (TIPS,2002)

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In 2003 from total export of USD 358 million the main destination (by volume) Spain (33%), Italy(17%), Export to the rest of European Union (EU) represented only 14.5% of total export, while 3% of the volume exported went to markets on the African continent. (Democratic Republic of the Congo, Zimbabwe, Zambia, Mozambique and Mauritius) (TIPS, 2003).

Annual fish consumption in South Africa is estimated at 6,4-6,7kg per person, which is relatively low. South African consumers consume mainly meat; 30% of South Africans' food budget is spent on meat, compared to 4% on fish. Expanding the market internationally is therefore of vital importance to the South African fish industry. Note, furthermore, that not all the fish harvested by South Africa necessarily serves to satisfy domestic demand for fish products.

Fish caught in SA is mainly exported due to the higher returns internationally that were achieved previously. With the strength of the Rand this is under pressure. There is however significant import of fish especially from South America and the Asia Pacific.

2. Objective

In an effort to understand the trade performance in fish products by South Africa better, a starting point is examining South Africa's current trade in fish products. Hence the objective of this paper is to analyse the international trade performance of the South African fish industry. Useful tools in this regard are the Gini-coefficient, used to examine the degree of concentration for fish exports, and the Intra-industrial Trade coefficient (IIT), used to examine the balance of international fish trade by South Africa.

3. Data and methodology used

This analysis uses primary data from South Africa Marine and Coastal Management, Department of environmental Affairs and Tourism, and secondary data from sources such as Statistics South Africa and International Trade Community (ITC). To evaluate the trade

status of the South Africa fish industry, the Gini and IIT coefficients are used. The tools are discussed in the next subsections.

2.1 The Gini coefficient

The extent of concentration is determined by various factors, such as consumer preferences that result in different trade streams; trade barriers prohibiting or restricting trade between different regions and of certain products or product types; trade agreements and trade incentives; infrastructure; political stability or instability in a country; and the ability to pay, which is a function of income (Lubbe, 1992).

The Gini coefficient is defined graphically as a ratio of two surfaces involving the summation of all vertical deviations between the Lorenz curve and the perfect equality line. The Gini coefficient was developed to measure the degree of concentration (inequality) of a variable in a distribution of its elements. It compares the Lorenz curve of a ranked empirical distribution with the line of perfect equality. This line assumes that each element has the same contribution to the total summation of the values of a variable. The Gini coefficient ranges between 0, where there is no concentration (perfect equality), and 1, representing total concentration (perfect inequality). The closer the coefficient is to 1, the more unequal the distribution (Brian and Jean, 2005).

According to Hanson and Simmons (1995), a Gini coefficient is a relatively precise measurement of market concentration. The Gini coefficient (Gi) is formulated by the following equation:

$$G_i = 1 - \sum_{k=0}^{k=n=1} (X_{k+1} - X_k)(Y_{k+1} + Y_k)$$

Where:

Gi = Gini coefficient

X = Cumulated proportion of the variable being investigated

Y: = Cumulated proportion of the export value

2.2 The intra-industrial trade coefficient (IIT)

The IIT coefficient is a widely used measure to calculate the degree of trade of countries with each other, and can thus be used to explain trade patterns. The Factor Proportions Theory posited by Heckscher and Ohlin (Oleh and Peter, 1997), reflects trade flows in complementary goods, based on the relative availability and intensity of factors in the production process. Trade flows between countries occur in complementary goods, owing to the comparative advantage based on differing factor endowments in a perfectly competitive trading environment. Guzin and Haluk (2003) observed a significant increase in the IIT coefficient as a result of simultaneous buying and selling of the same or similar commodities. This trade describes trade in similar but slightly differentiated products, or trade in close substitutes demanded by consumers in different countries, who may have distinct tastes or preferences.

In trade literature, the amount of intra-industry trade, or trade in similar goods, is often taken as a measure of the diversity, degree of specialisation and degree of technical sophistication of a country's industrial sector. This can be used to infer a country's ability to compete in a changing environment (Oleh and Peter, 1997).

Grubel and Lloyd (1971) define the IIT index (GL_{it}) as follows:

$$GL_{it} = 1 - \frac{/ X_{it} - M_{it} /}{X_{it} + M_{it}}$$

Where:

X_{it} = Exports of industry i in period t

M_{it} = Imports of industry i in period t.

The value of GL_{it} lies between 0 and 1; zero indicates a low trade balance, while a value closer to 1 indicates a high rate of importing and exporting of the same or similar products by an industry.

4. Results and discussion

Figure 1 shows that total fish export by South Africa in 2003 was about USD 358 million. Spain was the biggest importer, accounting for about 33%; Italy followed (about 18%); the other countries together accounted for less than 50% of exports by South Africa.

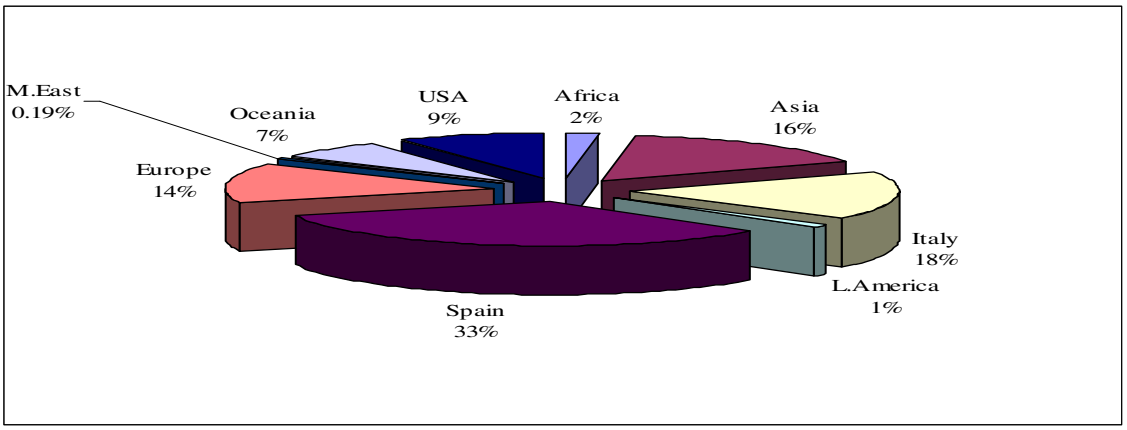

Figure 1: Distribution of South Africa fish exports in 2003

Source: TIPS (2003)

Rests of Europe's are include Denmark, Ireland, Luxembourg, Sweden, New Zealand, Belgium, Switzerland, Netherlands, UK, Greece and France.

Figure 2 shows the Lorenz curve for fish exports from South Africa to 54 countries in 2003. The x-axis reflects the countries that imported fish from South Africa, ranked from low to high. The y-axis shows the cumulative percentages of fish exports by South Africa. As indicated, the cumulative percentage of exports to 46 countries is less than 2%. This indicates that fish export by South Africa is highly concentrated. The Gini coefficient for fish export was calculated as 0,846.

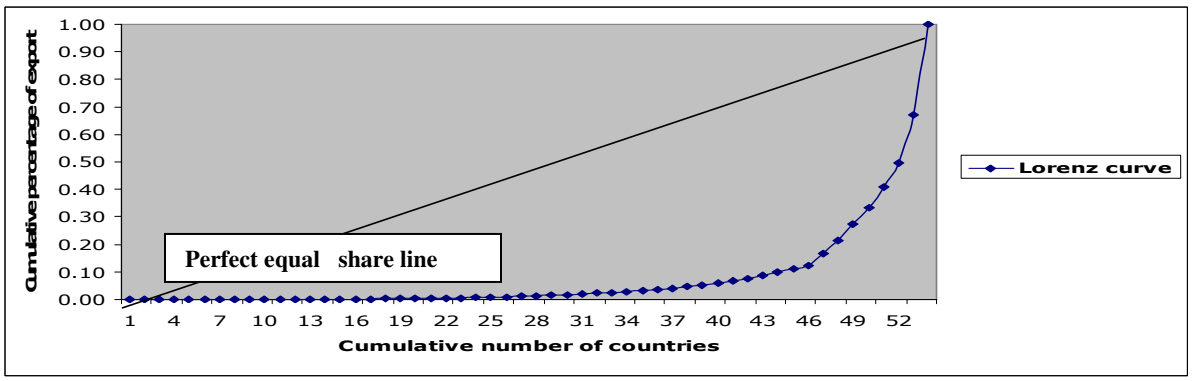

Figure 2: Lorenz curve for South African fish exports

As stated earlier, the main export destinations for fish export are Spain and Italy. The trend of concentration appears to have remained the same, i.e. Spain and Italy have remained the main export destinations for South African fish. This may indicate that South African fish exports are competitive in these two markets, which could be a result of consumer preferences towards South African fish products, the ability of the South African fish industry to comply with market requirements, or higher profitability. Moreover, exclusion of the Spanish fleets from South Atlantic waters.

Both Spain and Italy are white fish markets. In the past both consumed significant amounts of Cod which has now been replaced by hake. Spain imports hake at significant volumes from Chile, Namibia and Argentina as well with the concentration being on fresh fish and fish blocks.

Furthermore, Spain used to have the world's largest Hake fleet, deployed on the coasts of Namibia, Argentina and in the North Atlantic. Spain's largest fishing company, Pensacola, is represented all over the world with major subsidiaries in Namibia, Argentina and Chile.

Import tariffs in the EU are the same throughout for fish and are dependent on the country of origin. SA has varying tariffs based on product type) ranging from 6 to 15%. Countries like Namibia and Chile have 0% tariffs. Based on discussions I have had with senior government officials in SA, there are at present a move to try and have the tariffs into the EU removed which should further increase SA's competitiveness into this market.

Important to note that, the high level of concentration could be render the fisheries in South Africa vulnerable to regulatory changes in the markets of Spanish and Italian. This issue not addressed in this paper and hence needs further investigation. It might be difficult to diversify into other (Northern) European markets since they prefer this Cod. Moreover, it is imperative that new markets are developed.

The calculated IIT indices for the fish industry and the total agriculture industry are given in Figure 3. Interesting to note is that the two IIT indices have followed similar trends since 1985. Prior to 1985 the IIT for the fisheries industry was significantly higher.

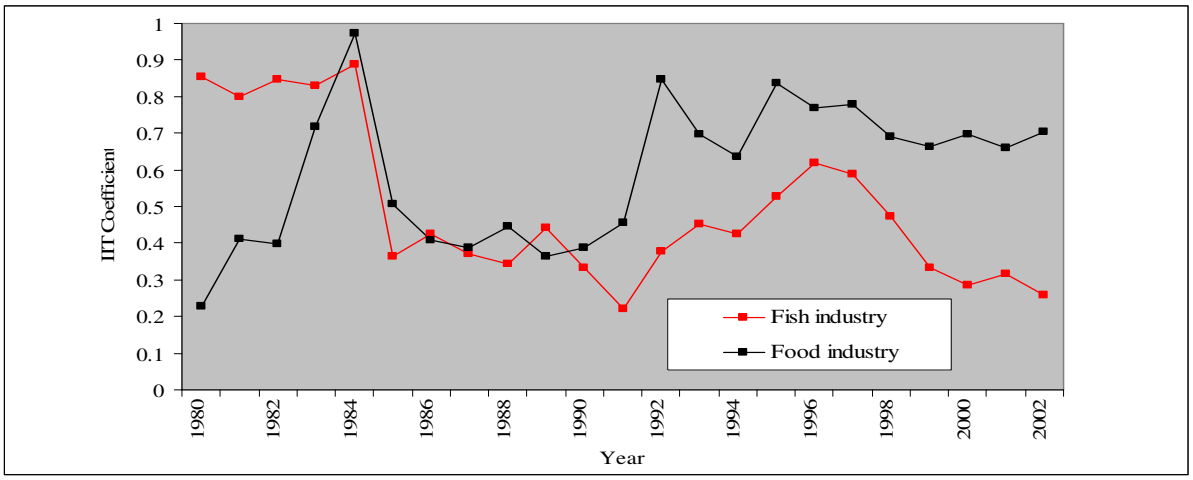

Figure 3: IIT coefficient for the fish and agriculture industries

The high value of the IIT for the fish industry in the period prior to 1985 can be attributed to the fact that the values of imports and exports of fish products were more or less equal (see Figure A.1 in Appendix A). The significant increase in the IIT for the total agricultural product is a result of a substantial decline in the value of food exports and a slight increase in the value of food imports over the period 1980 to 1985 (see Figure A.2 in Appendix A). From 1986 to 1990 both industries experienced imports and exports of more or less the same value. Since 1990 the gap between the value of food imports and exports narrowed, resulting in a higher IIT, but in the case of the fish industry the gap first increased, then narrowed and then widened again. In the case of the former it may be due to (i) South Africa being accepted back into the world community, (ii) gradual momentum gained after deregulation of the agricultural industry, resulting in a freer domestic market and (iii) the process of complying with the Agreement of Agriculture (AoA) that resulted in a greater number of more open markets, both domestically and internationally. In the case of the fisheries industry, it appears that similar factors to those mentioned for the agricultural products,

except point-determined trade volumes, but since 1999, the value of exports increased substantially more than the value of imports. This may indicate that the fisheries industry has been able to increase its exportable surpluses because of increased specialization and competitiveness. Exclusion of the Spanish fleets from South Atlantic waters, open up trade opportunities to South Africa.

After 2002 the value of exports fish decreased substantially, this may be due to i. Substantial decrease of Total Allowable Catch (TAC) for hake in 2002; ii. Substantial increase of Total Allowable Catch (TAC) for hake in 2002 (of competitor countries) like Namibia (195 000 tons) and Argentina (405 000 tons)), and iii. Recent application of non-tariff regulations in EU with respect to food safety

One should note that the industry has focused quite specifically at growing the international markets as the opening of the SA domestic market has seen some influx of lower priced products (especially in the tinned sector) which made exports more attractive. One must also not forget the impact of the USD: R exchange rate and I would hesitate to go along with the comments unless they are also accurate in terms of USD or Euro sales.

For example, the fisheries industry has committed considerable resources to complying with international standards and regulations that *inter alia* contribute to greater competitiveness in a sophisticated market (Jooste, Kruger and Kotze, 2003).

5. Conclusions

This paper investigated the trade performance of the South African fish industry. The analytical tools used were the Gini and Intra-Industrial Trade coefficients. These tools are useful for measuring the level of concentration and patterns in trade.

The Gini coefficient for fish exports shows that fish export by South Africa is highly concentrated. Of the 54 markets to which South Africa exports fisheries products, the bulk goes mainly to Spain and Italy. The trend in concentration also appears to have remained the

same, i.e. Spain and Italy have remained the main export destinations for South African fish exports. It therefore appears that the South African fisheries industry may have a competitive advantage in these two markets, but cognisance should be taken that such a high levels of concentration may render the South African fisheries industry vulnerable to exogenous changes (e.g. in EU policies and standards) if it is not based on "true" competitiveness fundamentals.

The results showed a high IIT for the South African fisheries industry prior to 1985, meaning that imports and exports were more or less equal. Thus, during this period South Africa exported fisheries products to approximately the same value as that imported, possibly implying that the local industry did not cater entirely for domestic demand. The situation, however, changed after 1985, indicating that the industry has undergone substantial changes in that it has been able to increase its exportable surpluses, probably as a result of increased specialization and competitiveness.

The analysis conducted does not pertinently explain the factors that sustain the levels of concentration, nor does it highlight specific factors that may underpin the competitiveness of the industry, and hence further analysis in this regard is necessary.

References

Alan, O. (2002). Free trade agreement in the era of globalisation new instruments to advance new interests the case of Australia. *Issues Paper (22): The Australian APEC study centre*. Monash University, Australia.

AMT, (2004). *Trade agreements industry review*. Available at: www.agricmark.co.za.

Brain, S. and Jeans, P.R. (2005). *Transport geography on the web: Concentration and Lorenz curve*. Available at: http://people.hofstra.edu/geotrains/index.html.

Darrin, Q. (2002). *Farmers' opposition to corporate globalisation and trade agreements.* Available at: www.nfu.ca/briefs/Toronto_conference_4_PDF.bri.pdf.

Jooste, A., Kruger, E. and Kotze, F. (2003). Standards and trade in South Africa: Paving pathways for increased market access and competitiveness, Chapter 4: 235 - 370. In Wilson, J.S. & Abiola, V.O. (Eds.). *Standards and global trade: A voice for Africa.* ISBN 0-8213-5473-6. Washington DC: The World Bank,.

Grant, R.M. (1997).*Contemporary strategy snalysis*. 3rd Edition. Marled, USA: Blackwell Publishers.

Grubel, H. and Llyod, P.J. (1971). The empirical measurement of intra-industry trade. *American Journal of Economics*, Vol 470: 494-517.

Guzin, E. and Haluk, E. (2003). Intra-industry trade and labour market adjustment in Turkey. *American Journal of Contemporary Economic Policy*, Vol. 14(5).

Hanson, P. and Simmons, P. (1995). Measures of buyer concentration in the Australian wool market. *American Journal of Agricultural Economics*, Vol 63(2).

Lubbe, W. (1992). The red meat marketing scheme: An evaluation in a dynamic environment. *Unpublished Ph.D. thesis*. Pretoria: University of Pretoria.

Oleh, H. and Peter, K. (1997). *Intra industrial trade of Arab countries: An indicator of potential competitiveness*. Available at: www.imf.org/external/publs/ft/wp/wp9747.pdf.

SADC (2001). *SADC Marine Fisheries & Resources Sector.* Available at: http://www.sadcfisheries.com/country.asp?countryid=4

South Africa Information (2005). Available at: www.southafrica.info/doing_business/sa_trade/agreements/trade_europe.htm

Statistics South Africa (2005). Available at: www.statssa.gov.za.

Steven, M.S. (2003). *International trade theory and policy*. Available at: http://internationalecon.com/vo/ch40/40econ.htm/#lp.

Trade and Industrial Policy Strategies (2005). Available at: www.tips.org.za..

Verbeke, W., Doyer, O.T. and Visser, D.P. (2002). Supply chain management and traceability in pork chains: The Belgian and South African Case. *Agrekon,* Vol 41(1).