How Competitive is Agribusiness in the South African Food Commodity Chain?

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HOW COMPETITIVE IS AGRIBUSINESS IN THE SOUTH AFRICAN FOOD COMMODITY CHAIN?

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ABSTRACT

The competitiveness of sixteen selected food commodity chains in South Africa was calculated using the Revealed Comparative Advantage method of Balassa. The majority of commodity chains are marginally competitive. Except for the maize, pineapple, and apple chains, the competitiveness index generally decreases when moving from primary to processed products. This implies that benification or "value adding" opportunities in South Africa are restricted. To compete in a global economy strategies should be followed that improve the competitiveness of the whole food supply chain. It is i.e. not good enough for farmers to be able to compete globally at farm gate level, whilst the locally processed commodities that is sold to the consumer is not competitive in the world market.

1. INTRODUCTION

Agriculture policy and practice in South Africa has changed dramatically over the past decade. Almost five years after the publication of the Kassier Report (Kassier, 1992), the new Marketing of Agricultural Products Act, No 47 of 1996 spells out a set of rules that differ greatly from earlier legislation. These changes, together with changes in the forces that affect the global market for agricultural products, require that farm producers and agribusinesses now have to position themselves as business driven competitors in a less controlled, "free market" global trading environment. In this new environment business interaction within the supply chain linking, input suppliers, producers, processors, traders and the final consumer becomes the reality for "value adding" (Soler and Tanguy, 1998).

In order to meet the challenges imposed by this situation, agricultural economic analysis have an important contribution i.e. to pinpoint inefficiencies and weaknesses in the supply chain, whilst emphasizing elements that could give competitive advantage to agriculture with regard to both the challenge of global competition and the satisfaction of local customer demand.

This article will focus to determine the status of agribusiness's competitiveness in the food production and processing chain. Agribusiness will be defined and the importance of supply chain analysis will be explained. A brief description of the principles and theoretical foundations of competitiveness analysis will follow i.e. Balassa's "Revealed" Comparative Advantage method and Porter's determinants of competitive advantage. Balassa's technique will then be applied to sixteen selected South African food commodity supply chains.

2. SUPPLY CHAIN ANALYSIS

Supply chain analysis (or added value chain analysis) indicate the competitiveness of each element or activity in the value chain. In South Africa, this is important. Wentzel (1996) showed that farm level wool production and woodpulp production in South Africa is internationally highly competitive, further processing or "value-adding" of these commodities however show a reduced level of competitiveness. Similar trends are observed for maize (unmilled) when processed as animal feed. Inus van Rooyen (1998) analyzed the competitiveness of the flower industry in South Africa and concluded that wild flowers and foilage production is highly competitive while house plants and cutflowers are less. These observations indicate that certain processes in the supply chain can indeed be competitive while others are less or even non-tradable. Any comprehensive statement on competitiveness should thus account for supply chain relationships.

A "supply chain perspective" gives a particular definition to agribusiness. The integrated nature of the supply chain require business transactions between all production processes – from the farm, past the farm-gate right to serving the final consumer. In the supply chain, agribusiness is defined to include both farming – primary agribusiness – and all transactions between suppliers, processors and service deliverers which deal directly with primary producers – secondary agribusiness. This definition will include cooperatives, input supply companies, financial institutions and other service deliverers, processors, etc. linking with the farmer.

The objective of analyzing the South Africa's food chain competitiveness would be to answer the following question: "Can agribusinesses in the agro-food system compete in the global market?" In particular, such analysis would highlight the ability of each sector in a particular food chain (production, marketing, processing etc.) to adapt to market changes, to produce and adopt technological innovations, its particular access to capital and its capacity to obtain and retain market share. In short, these variables measure and evaluate the efficiency, effectiveness, and sustainability of a particular supply chain (Ismea, 1999).

Food chain competitiveness analysis can be seen as an instrument capable not only of evaluating the existing state of competition within and between South African agro-food chains but also of outlining hypotheses and scenarios for the future. Considering these, the analysis form the basis for round table discussions, for policy and strategic positioning and planning by all participants in the chain to promote value adding and to address weaknesses.

3. PRINCIPLES OF COMPETITIVENESS ANALYSIS

Two concepts are frequently used to explain the issue of competitiveness *viz* the concepts of comparative advantage and competitive advantage (Van Rooyen, 1998). These concepts are important foundations for understanding the importance of international trade in agriculture and to illuminate the underlying factors responsible for current trade patterns.

Comparative advantage explains how trade could benefit nations through more efficient use of the world's resource base (land, labor, and capital inputs) when that trade is totally unrestricted. Competitive advantage explains existing trading patterns as they exist in the real world, including all the barriers to free trade i.e. policy effects, product quality differences and industry marketing skills which are ignored by comparative advantage (Worley, 1996). Competitive advantage therefore reflects business opportunities with in current policy and price distortions.

Some of the key elements of the historical development of economic thought in the area of competitiveness are summarized in Table 1. **The classical political economy:** Much of contemporary international trade theory is rooted in the writings of classical economists, notably Adam Smith (1723-1790), David Ricardo (1772-1823), and John Stuart Mill (1806-1873). The central conclusion of these authors' work is that, although there are exceptions, almost all countries can reach their highest possible levels of income and economic growth by maintaining open international trade; domestic production and consumption should thus be guided by the prices at which foreigners are willing to trade. Rather than restricting trade, governments should focus on maintaining competitive national markets and investing in public goods such as research and education. **Neoclassical Models:** Perhaps the greatest contribution to neoclassical models is to identify the sources of comparative advantage and specialization, or the reasons why one industry can profitably expand while others cannot. Without such explanations for the rise and fall of major industries, it will be argued that the theory of learning-by-doing i.e. experience is the only real source of comparative advantage. Only trade restrictions to "kick-start" industries can therefore "create" comparative advantage. Neoclassical models counter this argument and quantify five broad contributors to an industry's comparative advantage, namely,

technological efficiency, factor-intensity of different industries, industry-specific resources, domestic demand and exchange rates (Masters, 1995). **Challenges to Neoclassical Comparative Advantage:** Challenges to Neoclassical views of comparative advantage have come in two broad waves: one focusing on developing countries starting around 1950, and another focusing on industrialized countries starting in the early 1980's. Both challenges have been associated with periods of rapid change in production and trade levels, and demands for government interventions to support vulnerable industries. But a major difference is that most non-neoclassical theories for developing countries argued in favor of restricting imports to avoid "dependency" on others, while the corresponding theories for industrial countries argue for supporting exports with "strategic subsidies" to capture market share (Masters, 1995). These thoughts led to the development of analytical frameworks that addressed competitive factors (i.e. Porter and Balassa).

Table 1: Foundations of competitiveness analysis

Theories	Key concept(s)	Mechanism(s)
Classical Political Economy:		
Adam Smith (1776)	Market size/productivity	Specialization, competition
David Ricardo (1817)	Comparative advantage	International trade
J.S. Mills (1848)	Infant industries	Learning-by-doing
J.S. Mills (1873)	Politics of protection	Income distribution
Neoclassical Models:		
Ricardian (1817)	Technical efficiency	Use of a single key resource
Heckscher-Ohlin (1919, 1933)	Factor-intensity	Use of more than one resource
Ricardo-Viner (1937)	Specific factors	Use of industry-specific inputs
Heckscher-Ohlin-Samuelson (1962)	Consumer demand	Product preference
Salter-Swan (1959, 1960)	Exchange rates	Non-traded goods, inflation
Challenges to Comparative Advantage:		
Prebisch/Singer (1950)	Import-substitution	External terms of trade
A.O. Hirchman (1958)	Development strategy	Inter-industry linkage
New trade theorist	Strategic policy	Rent-shifting, externalities
Michael Porter (1990), Balassa (1977)	Competitive advantage	Factor creation, demand signaling

Source: Masters, 1995

4. MEASURING COMPETITIVENESS

There are many methods developed and used by researchers to measure competitiveness. In a recent study by ISMEA (ISMEA, 1999) basically two methods were prioritized to determine the competitiveness of the European Union food chains in a global environment namely the well-known approach to the study of competition originated by Porter (1990) and the competitiveness indicators as originally developed by Balassa (1977, 1986).

Determinants of competitive advantage (The Porter's method): When is an industry internationally competitive? In order to find an answer to this question a second question posed by Porter (1990) must first be addressed: "Why does a nation achieve international success in a particular industry?" According to Porter the answer lies in six broad attributes of a nation that shape the environment in which local firms can compete that promote the creation of competitive advantage. These are: **Factor conditions**. The nation's position in factors of production, such as skilled labor or infrastructure, necessary to compete in a given industry; **Demand conditions**. The nature of home demand for the industry's product and service;

Related and supporting industries. The presence or absence in the nation of supplier industries and related industries that are internationally competitive; **Firm strategy, structure, and rivalry**. The conditions in the nation governing how companies are created, organized, and managed, and the nature of domestic rivalry; **Government**. Government plays a vital role. Government can influence each of the above determinants either positively or negatively. That is why government as a determinant of competitiveness must be viewed apart from the four determinants; **The role of chance**. Chance events are occurrences that have little to do with circumstances in a nation and are often largely outside the power of firms (and often the national government) to influence. Events such as wars, political decisions by foreign governments, large increases in demand, shifts in world financial markets and exchange rates, discontinuity of technology and input demand can be described as chance events.

Porter's method not only evaluates the competitiveness of the farmer, but that of all the participants in the supply chain. This method allows to identify and analyze the structure of a sector and to point out the strengths and weaknesses. Critical success factors can also be identify to which participants in a chain have to pay special attention in order to develop and sustain competitive advantage as successfully as possible in the years to come.

Trade and "Revealed" Comparative advantage (The Balassa-method): The difficulty of measuring comparative advantage itself led Bela Balassa to investigate trade patterns directly, without reference to underlying resources, productivity, subsidies or prices. He argued that "revealed" comparative advantage (or competitive advantage) could be indicated by the trade performance of individual commodities and countries in the sense that the commodity pattern off trade reflects relative market costs as well as differences in non-price competitive factors, such as government policies.

Balassas Revealed Comparative Advantage (RCA) method compares a country's share of the world market in one commodity relative to its share of all traded goods. In Table 2 the competitiveness of selected food chains in South Africa are compared using FAO's trade data of the years 1996 and 1997. The Relative Revealed Comparative Trade Advantage (RTA) index to reflect both in and export was used which is based on Balassa's original formula. RTA is formulated as:

$$RTA_{ij} = RXA_{ij} - RMP_{ij} \qquad \qquad \dots 1$$
$$RXA_{ij} = (X_{ij}/\Sigma_{l,\, l\neq j}X_{il})/(\Sigma_{k,\, k\neq i}X_{kj}/\Sigma_{k,k\neq i}\,\Sigma_{l,\, l\neq j}\,X_{kl}) \qquad \qquad \dots 2$$
$$RMP_{ij} = (M_{ij}/\Sigma_{l,\, l\neq j}M_{il})/(\Sigma_{k,\, k\neq i}M_{kj}/\Sigma_{k,k\neq i}\,\Sigma_{l,\, l\neq j}\,M_{kl}) \qquad \qquad \dots 3$$

In equations 2 and 3, X (M) refers to exports (imports), with the subscripts i and k denoting the product categories, while j and l donate the country categories. The numerator is equal to a country's export (imports) of a specific product category relative to the exports (imports) of this product from all countries but the considered country. The denominator reveals the exports (imports) of all products but the considered commodity from the respective country as a percentage of all other countries' exports (imports) of all other products. The level of these indicators shows the degree of revealed export competitiveness/import penetration.

While the indices RXA and RMP are calculated exclusively based on either export or import values, the RTA considers both export and import activities. From the point of view of trade theory and globalization trends, this seems to be important and due to the growth in intra-industry and/or entrepot trade, this aspect is becoming increasingly important (ISMEA, 1999). The RTA indicator implicitly weights the revealed competitive advantage by calculating the importance of relative export and relative import competitive advantages. Values below (above) zero point to a competitive trade disadvantage (advantage).

5. DISCUSSION: THE STATUS OF AGRIBUSINESS COMPETITIVENESS

- **Marginal competitiveness** The South African agribusiness industry is generally marginal as far as international competitiveness is rated as most RTA values are situated around zero (wheat, sugar, potatoes, tomatoes, beef processing, milk, pig meat). This implies that minor adjustments related to increased productivity can contribute to changing negative situations into positive status. It will however be important to identify the particular set of supply chain interactions, which needs to be upgraded. A more comprehensive analysis, using inter alia the determinants of competitive advantage (Porter's method) is thus required.

- **Decreasing competitiveness in the supply chains:** The maize, pineapple, and apple chains are competitive while the meat, milk, sunflower, and soybeans chains are non-competitive. Except for the wheat, maize, apple, and pineapple chains the competitiveness in the other chains decrease from primary to processed products. This imply that benificiation or "value adding" opportunities in South African agribusiness is restricted, while farm production is relative competitive. One possible explanation for this could be the high rates of returns recorded for farm level applications of technology for most primary commodities (Thirtle *et al*, 1998). It will thus be important to "discover" the underlying reasons for non-competitiveness in each chain. Does it relate to a lack of technological innovation, unproductive labor, high input cost, low quality or maybe government trade policy, etc.?

- **Variations over time in competitiveness (1980-1998)**: Except for flour of maize, groundnuts in shell, grapes and oil of sunflower there are no great variance in the competitiveness over the years from 1980 to 1998. Flour of maize, sugar (centrifugal, raw), sugar refined, groundnuts in shell, oranges, apples, pineapples canned and the whole grape chain show positive trends in competitiveness from 1980 onwards. Cake of soya beans, oil and cake of sunflower and the whole sheep chain shows a negative trend from 1980. Wheat, flour of maize, sugar (centrifugal, raw), sugar refined, soya beans, apples, grapes pineapples canned, pineapples juice, beef and veal, fresh cow milk and the whole orange chain shows positive trends in competitiveness the last four years, while flour of wheat, wine, cake of soya beans and the whole sheep chain negative trends revealed.

- As noted by Balassa, the problem of RCA analysis is that it says nothing about how a country acquired its market share. Market share may well be maintained by costly export subsidies. The sustainability of a competitive position, according to the Balassa index, is therefore in question, especially in view of the continuous global movement to "free-up" markets. For South African's agribusiness the

reality of "unequal" playing fields are also important. Without comprehensive policy and operational support to minimize "dumping" by highly subsidized economies from the European Union, and even USA any competitive foot hold could be difficult for South African agribusiness to attain and maintain. "Fair protection" to remove "unfair" distortions will be required.

Table 2: Competitive advantage of selected food chains in South Africa in 1998 and 1997 and trends in competitiveness from 1980 to 1998 and 1995 to 1998 based on the Relative Revealed Trade Advantage (RTA) index

Chain	Product	RTA 1998	RTA 1997	Trends 1980 - 98	Trends 1995 - 98
Wheat chain	Wheat	-0.85	-0.77	=	+
	Flour of wheat	1.26	1.60	=	-
	Macaroni	-0.49	-0.39	=	=
	Pastry	0.15	0.06	=	=
	Bread	-0.13	-0.11	=	=
	Breakfast cereals	-0.28	-0.20	=	=
Maize chain	**Maize**	2.44	3.72	=	=
	Flour of Maize	28.55	10.10	+	+
Potatoes chain	Potatoes	0.85	0.86	=	=
	Potatoes, frozen	0.07	0.05	=	=
Sugar chain	**Sugar (Centrifugal, Raw)**	8.88	3.00	+	+
	Sugar refined	2.08	1.86	+	+
	Sugar confectionery	0.32	0.39	=	=
	Maple sugar and syrups	-0.02	-0.03	=	=
Soybeans chain	Soybeans	0.17	-0.11	=	+
	Oil of Soya beans	-0.85	-0.43	=	=
	Cake of Soya beans	-1.62	-1.53	-	-
	Soya sauce	-0.30	-0.27	=	=
Groundnuts chain	**Groundnuts in shell**	9.69	8.69	+	=
	Groundnuts shelled	1.51	5.12	=	=
	Oil of groundnuts	4.71	4.17	=	=
	Prepared groundnuts	0.01	0.05	=	=
Sunflower chain	Sunflower seed	-0.16	-0.36	=	=
	Oil of sunflower	-6.91	-6.62	-	=
	Cake of sunflower	-1.91	-5.97	-	=
Tomatoes chain	Tomatoes	0.13	0.07	=	=
	Tomato juice	0.36	-0.08	=	=
	Tomato paste	-0.07	-0.06	=	=
	Peeled Tomatoes	-0.57	-0.78	=	=
Oranges chain	**Oranges**	16.53	13.67	+	+
	Orange juice	1.01	0.39	=	+
Apples chain	**Apples**	10.08	6.62	+	+
	Apple juice	6.59	11.35	=	=
Grapes chain	**Grapes**	14.07	10.29	+	+
	Grape juice	3.67	-1.29	+	=
	Wine	2.40	2.49	+	-
Pineapple chain	**Pineapples**	1.41	0.90	=	=

Chain	Product	RTA 1998	RTA 1997	Trends 1980 - 98	Trends 1995 - 98
	Pineapples, canned	7.41	7.18	+	+
	Pineapple juice	7.20	7.25	=	+
Cattle meat chain	Cattle	-1.46	-3.76	=	=
	Beef and veal	0.23	-0.13	=	+
	Beef dried salt smoked	0.19	0.34	=	=
Milk chain	Cow milk (whole, fresh)	0.43	0.27	=	+
	Butter of cow milk	0.22	-0.70	=	=
	Cheese	-0.05	-0.24	=	=
Sheep meat chain	Sheep	-8.60	-5.17	-	-
	Mutton and lamb	-1.71	-1.73	-	-
Pig meat chain	Pigs	0.01	0.02	=	=
	Pig meat	-0.39	-0.42	=	=
	Bacon-ham of pigs	0.00	0.00	=	=

Source: Own calculation based on data from FAOSTAT 1999
'+' positive trend; '-' negative trend; '=' constant trend

6. CONCLUSIONS

World trade is driven by the competitive advantage that firms in countries have in producing different goods and services. To compete in a global economy farmers and agribusinesses will have to be competitive, scarce resources will need to be optimally utilized and evolved to the creation of pockets of excellence in a sector, embracing the concept of the agricultural value chain (Zuurbier, 1999). This centers around the concept of each input supplier, producer and processor's ability to compete globally i.e. it is not good enough for farmers to be able to compete at farm gate level, whilst the locally processed commodity, that is sold to the consumer, is not competitive in the world market.

In this article, the competitiveness status of agribusiness in sixteen food supply chains was determined. Except for the wheat, maize, apple, and pineapple chains the competitiveness in most of the other chains decrease when moving from the primary to processed products. These findings have serious implications for market strategies and local value adding and employment creation opportunities. Many commodities are marginally competitive. International alliances to integrate into competitive chains might be required. It will therefore be important to pin point the sources of reduced competitiveness and develop appropriate strategies to improve the South African situation.

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