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# MEASURING THE AGRIBUSINESS DECISION ENVIRONMENT: CONSTRUCTING AN AGRIBUSINESS CONFIDENCE INDEX FOR SOUTH AFRICA

D Esterhuizen<sup>1</sup> & CJ van Rooyen<sup>2</sup>

## Abstract

*South African agribusinesses are experiencing far reaching changes. Economists have developed indicators, generally known as indexes, to measure relative change in the industry. In this article the methodology to construct a business confidence index for agribusiness in South Africa is discussed. The objective of such an index is to determine the business confidence of agribusinesses as accurately as possible. Some 80 agribusinesses in South Africa are at present participating in the **AGRIBUSINESS CONFIDENCE INDEX**. For the first quarter of 2002 the index points to a 20% improvement in the business confidence of South African agribusinesses compared to the same period the year before, while in the second quarter the index was up 14% on the previous year. This increase in confidence goes hand in hand with some other positive trends in the agricultural sector of South Africa regarding competitiveness and investment.*

## 1. INTRODUCTION

Today's world is characterised by almost daily change on many terrains. South African agriculture and agribusinesses have not been unaffected by this trend, and have been subjected to far reaching changes brought about by globalisation and rapid changes in technology and consumer behaviour. These changes are dynamic, changing the nature of farming and business and requiring regular and sustained responses. They have a direct effect on the business confidence of managers and influence their next business decision in the short, medium and long term.

To measure these changes economists have developed indicators, generally known as indexes. An index is a ratio that measures a relative change (Steyn, Smit & Du Toit, 1989). The goal with the calculation of an index is to quantify change in a standardised manner. In South Africa the business confidence index of the South African Chamber of Business (SACOB, 2002), which measures the business confidence of managers in the economy in general, is

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<sup>1</sup> Agricultural Business Chamber.

<sup>2</sup> Agricultural Business Chamber and the ABSA Chair in Agribusiness Management, University of Pretoria.

well known. However, until now there has been no index measuring business confidence in the agricultural sector.

Although not often recognised, the agricultural sector makes a major contribution to the South African economy. It has upstream or backward linkages on the supply side and downstream or forward linkages on the manufacturing side. While the relative contribution to the country's Gross Domestic Product (GDP) is only about 3% to 4% (National Department of Agriculture (NDA), 2002), this does not reflect its importance to the economy. If one takes into account the strong forward and backward linkages, its contribution is much larger as it creates approximately 1.6 jobs outside agriculture for every job in agriculture. It provides 10.5% of the country's formal employment directly and creates employment for another 16% of the workforce in other sectors (Van Rooyen & Esterhuizen, 2000). Agro-food industries outperform non-agricultural related industries significantly in an economic development context (Eckert, Liebenberg & Troskie, 1997). A notable fact is that nine of the top ten employment generators in the economy as a whole are found in the agro-food sector. They are: tobacco products, oils and fats, basic chemicals, meat products, animal feeds, other foods, dairy products, grain milling, sugar products, paper products and canning (Van Rooyen & Carstens, 1996).

The challenge to agricultural economists is to develop a measure of changes in business confidence in the agricultural sector of South Africa as a response to the changing environment in order to assist with decision-making in a dynamic world. In this article the methodology to construct a business confidence index for agribusiness in South Africa will be discussed followed by an analysis of the results.

## **2. METHODOLOGY**

There are many concepts in the social sciences that can be measured directly in a satisfactory manner, but many others for which this cannot be done. For example, a bank's prime interest rate on loans, or the percentage of workers in a city on relief, is a fairly well defined concept capable of direct measurement. However, it is not clear how one should measure such things as the intelligence of students, the confidence of managers, the cost of living or the ability of farmers to perform.

For things that do not lend themselves to direct measurement it is necessary to introduce some associated quantity that will serve to represent them quantitatively. Psychologists have used certain tests for measuring students' academic talents and, on the basis of such tests, have introduced a quantity

called an intelligence quotient for discussing intelligence in a quantitative manner (Steyn *et al*, 1989). Similarly, economists have introduced various quantitative measures for describing the level of the stock market, with common examples including the Dow-Jones Industrial Average and the Johannesburg Stock Exchange index.

Over the years, indexes have become increasingly important to managers as indicators of the changing economic and business environment and activity. In fact, the use of indexes has become the most widely accepted procedure for measuring changes in business conditions (Steyn *et al*, 1996). There are many different indexes, and these can be defined according to the way in which the index is constructed (Steyn *et al*, 1996). Examples include price indexes, quantity indexes, value indexes, quality indexes and sociological indexes.

A simple index is used to represent the change of a single factor, while a composite index is used to represent the change of more than one factor. When an unweighted composite index is calculated, the changes of all the factors are regarded as equally important, while in a weighted composite index different weights are allocated to the factors according to the relative importance of each.

The selection of the weighting leads to a special types of composite index. If the weights of the base period are used the index is called the Laspeyres index (Steyn *et al*, 1996).

$$I = \frac{\sum F_n w_o}{\sum F_o w_o} \times 100 \quad (1)$$

Where:

I = Index

$F_n$  = Factors in period n

$F_o$  = Factors in period o (base period)

$W_o$  = Weight of each factor as determined in base period

### 3. CONSTRUCTING AN AGRIBUSINESS CONFIDENCE INDEX

The term "agribusiness" was coined by two economists, John Davis and Ray Goldberg, at the Harvard Business School in 1957 (Pacific Agribusiness Alliance, 1999). The agricultural industry had been changing drastically since the early 1900s, when almost all agricultural activity took place on the farm. Davis and Goldberg believed the term agribusiness was more suitable to describe the whole of all these enterprises that now take place outside the farm gate, bringing products from the field to the consumer. Malcolm &

Davidson (1999) visualized the agribusiness sector as a vertical “slice” of an economy comprising of many parts. The agribusiness “slice” is where consumers and producers of goods and services related to agriculture operate. Thus, the agribusiness sector is a chain of industries directly and indirectly involved in the production, transformation and provision of food, fibre, chemicals and pharmaceutical substrates. Links in the agribusiness chain include the following industry sectors (Zuurbier, 1999; Soler & Tangury, 1998):

- **Primary production** of commodities such as unprocessed food, aquaculture, fibre, chemical and pharmaceutical substrates
- **Tertiary transformation** of the commodities into value added products - where the value is derived from the process of transformation
- **Supply of inputs** to the primary and tertiary sectors
- **Retail and wholesale provision** of commodity and value added food, fibre and related products to consumers
- The **provision of services** such as finance, insurance and technical advice

In constructing an **AGRIBUSINESS CONFIDENCE INDEX** for South Africa, enterprises involved in the last four activities in the agro-food and fibre supply chain were selected, as these provide a most reliable and measurable “barometer” of the situation in the agro-food and fibre chain.

Ten economic and business indicators or factors were determined after discussions with the executive management of a group of agribusinesses and agricultural economists (Agricultural Business Chamber (ABC), 2001). Other indexes, international as well as domestic, were also investigated in order to arrive at a ‘best practice’ index. Both macro and micro indicators are included in the index. The ten factors that were decided on are:

- Turnover of business
- Net operating income of business
- The employment trend in the business
- Capital investment by the business
- Economic growth in South Africa
- Amount of export by the business
- General agricultural conditions in South Africa
- The trend in market share by the business
- The increase or decrease in debtor provision for bad debt by the business
- The increase or decrease in financing costs

The importance of the indicators was also determined through a survey, and weights were given for each of them (Table 1).

**Table 1: The mean, coefficient of variation and weights assigned to each factor**

Factors	Mean <sup>a</sup>	Coefficient of variation <sup>b</sup>	Weight assigned to factor
Turnover	3.36	21.78%	1.26
Net operating income	3.43	20.13%	1.29
Employment	2.93	25.68%	1.10
Capital investment	3.59	15.84%	1.35
Economic growth in South Africa	3.69	14.67%	1.39
Exports	3.10	21.69%	1.17
General agricultural conditions	3.29	16.27%	1.24
Market share	2.66	30.66%	1.00
Debtor provision for bad debt	3.10	21.69%	1.17
Financing cost	3.10	21.69%	1.17

Notes: <sup>a</sup> Scores ranging from 1 (no determinant of business confidence) to 4 (very important determinant of business confidence).

<sup>b</sup> The coefficient of variation represents the standard deviation as a percentage of the mean. The higher the coefficient, the higher the variation.

The **AGRIBUSINESS CONFIDENCE INDEX** is compiled on a quarterly basis, starting with the first quarter of 2001, and with the year 2001 as base year. In selecting the base period for a particular index, two rules should be observed. First, the period selected should, as much as possible, be one of economic 'normalcy' or stability rather than one at or near the peak of an expanding economy or the trough of a recession or declining economy. Second, the base period should be recent, so that comparisons will not be unduly affected by changing technology, changing product quality, and/or changing consumer attitudes, interests, tastes and habits (Steyn *et al*, 1996).

The index is compiled by asking a representative group of agribusinesses that do business directly with agricultural producers for their opinion on the 10 key economic and business indicators. These agribusinesses are mainly agricultural companies, agricultural co-operatives in the commercial sector; agricultural co-operatives in the developing agricultural sector; and companies which arose out of the conversion of agricultural co-operatives. These businesses play a significant role in the economy of South Africa as handlers, processors and marketers of agricultural products, and as suppliers of production inputs and services. In addition, they are major employers, developers and sources of added value, representing total assets of almost R30bn and an annual agricultural business turnover of approximately R50bn. Together they operate more than 2,000 service centres country-wide and employ more than 100,000 people. In many rural areas, these agribusinesses

are the business hub of the community and make a key contribution to maintaining the rural economic infrastructure.

Primary data are collected every quarter from a sample of about 80 agribusiness enterprises. Their views are obviously based on own experience and perceptions but also on hard facts that are essential for sound business decision-making.

#### 4. RESULTS

For the first quarter of 2002 the **AGRIBUSINESS CONFIDENCE INDEX** points to a 20% improvement in the business confidence of South African agribusinesses compared to the same period in the previous year, while there was a 14% increase in business confidence in the second quarter of 2002 a compared to the second quarter of 2001 (see Table 2). The third quarter of 2002 realized an improvement of 10% in business confidence.

This improvement in business confidence is driven largely by expectations of better agricultural conditions, higher capital investment, larger turnover and operating income, higher volume of exports and greater market share. Good news is the expected increase in employment and job creation that can be facilitated by such growing confidence. A decrease in the provision for bad debt is also expected.

Factors that influence the index negatively include the expectations of an increase in the cost of finance and the fact that agribusinesses are still not positive in their expectations of economic growth, although the situation has improved somewhat since the last quarter of 2001.

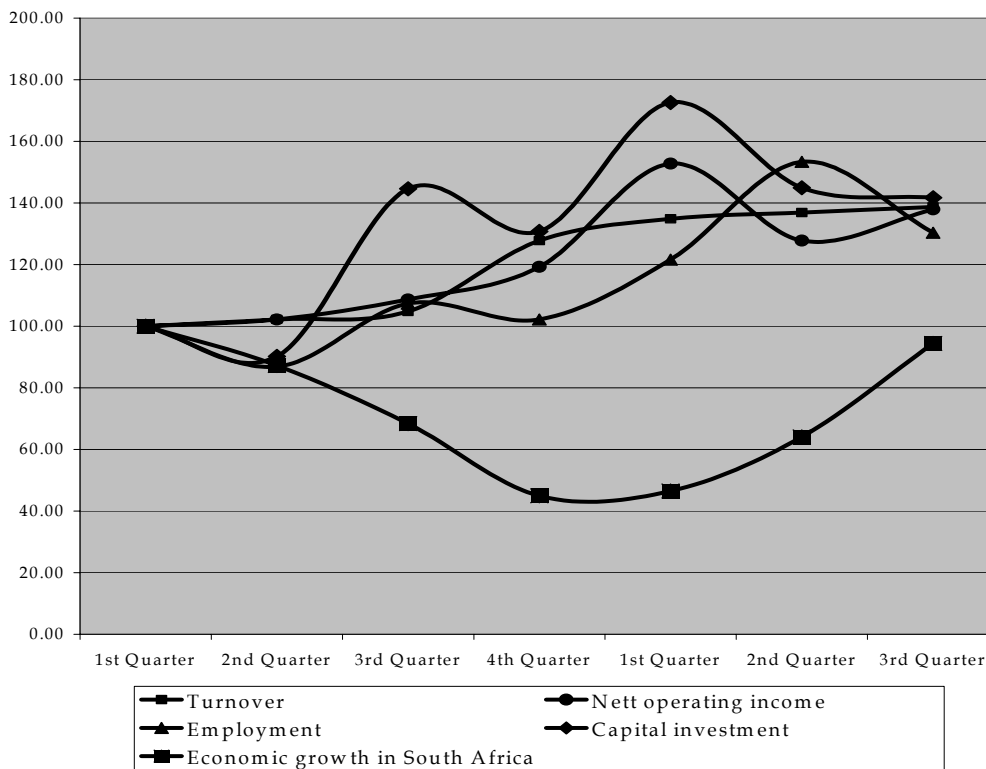
**Table 2: AGRIBUSINESS CONFIDENCE INDEX**

Key Indicators	1 <sup>st</sup> quarter 2002 in comparison with the 1 <sup>st</sup> quarter of 2001 (1 <sup>st</sup> quarter 2001 = 100)	2 <sup>nd</sup> quarter 2002 in comparison with the 2 <sup>nd</sup> quarter of 2001 (2 <sup>nd</sup> quarter 2001 = 100)	3 <sup>rd</sup> quarter 2002 in comparison with the 3 <sup>rd</sup> quarter of 2001 (3 <sup>rd</sup> quarter 2001 = 100)
Turnover	137.56	133.93	134.63
Net operating income	145.31	125.00	131.68
Employment	121.78	176.47	125.00
Capital investment	175.10	160.71	101.03
Economic growth in South Africa	46.65	73.43	143.84
Exports	124.14	114.62	112.00
General agricultural conditions	179.22	131.69	116.25
Market share	126.94	129.63	108.29
Increase in debtor provision for bad debt	113.25	84.59	69.47
Increase in financing costs	49.79	196.58	351.43
<b>Overall index</b>	<b>120.45</b>	<b>114.06</b>	<b>110.61</b>

Source: Own calculations.

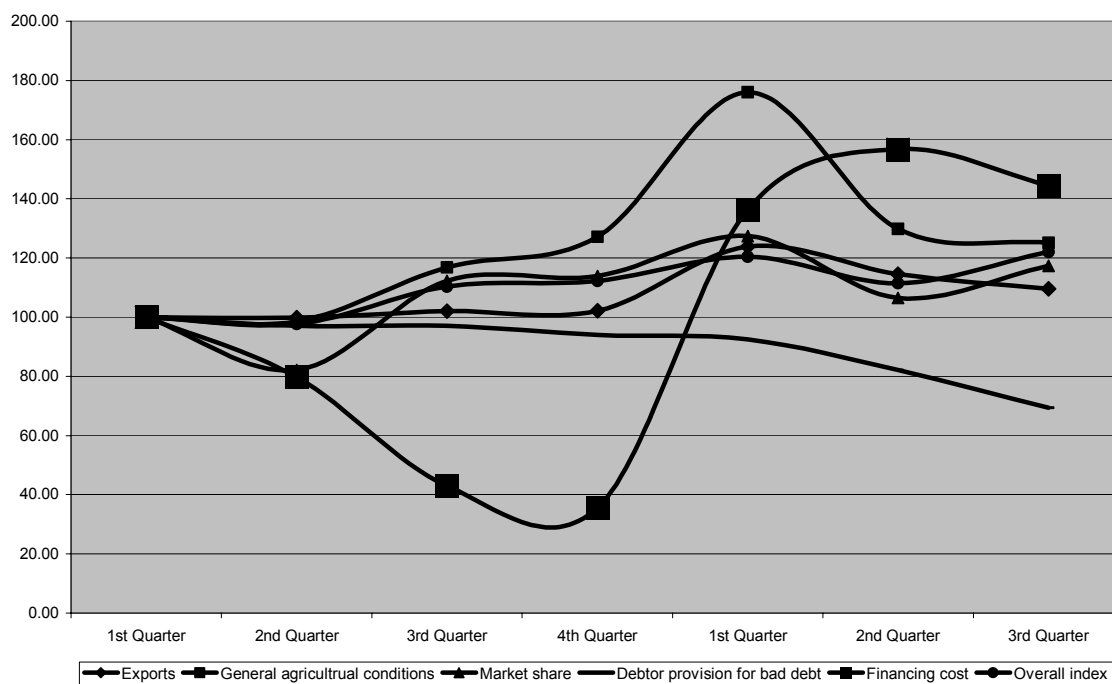
In Figure 1a and Figure 1b the trends of each factor in the **AGRIBUSINESS CONFIDENCE INDEX** as well as the overall index are indicated from the 1<sup>st</sup> quarter of 2001 to the 3<sup>rd</sup> quarter of 2002, with the 1<sup>st</sup> quarter of 2001 as base year. The following interesting trends can be seen from the figures:

- There is a definite negative trend in agribusinesses expectations of economic growth in South Africa from the 1<sup>st</sup> to the 4<sup>th</sup> quarter of 2001, with a turnaround since in the 1<sup>st</sup> and 2<sup>nd</sup> quarters of 2002
- Positive trend in the expectations in general agricultural conditions. However there is a decrease from the 1<sup>st</sup> to 2<sup>nd</sup> quarter of 2002
- From the 4<sup>th</sup> quarter of 2001 there is a huge increase in financing cost
- Constant positive trends in the expectation in the increase in market share and exports
- Positive trends in the agribusinesses expectations of increase in turnover, nett operating income, capital investment and employment
- A decrease in debtor provision for bad debt is also expected
- Positive trend in overall business confidence from the 1<sup>st</sup> quarter of 2001





**Figure 1a: Trends in the AGRIBUSINESS CONFIDENCE INDEX**



**Figure 1b: Trends in the AGRIBUSINESS CONFIDENCE INDEX**

### 5. TEST OF CONSISTENCY

It is important to link the results of the **AGRIBUSINESS CONFIDENCE INDEX** to other performances in the agricultural sector to control whether an increase or decrease in the index reflects reality. The increase in agribusiness confidence in South Africa goes hand in hand with some other positive trends in the agricultural sector of South Africa re: competitiveness and investment (Esterhuizen, Van Rooyen & Doyer, 2002; Esterhuizen & Van Rooyen, 2001).

According to Esterhuizen & Van Rooyen’s (2001) assessment, there was an increase of 12% or 5 index points in the competitiveness of the South African agricultural sector from 1999 to 2000. The competitiveness index serves as a measure of a sector’s competitiveness in terms of its ability to trade sustainably and successfully at competitive prices in the global environment.

The competitiveness index for the South African agricultural sector had improved from 0.41 in 1999 to 0.46 in 2000. This upward trend has persisted since 1992 when the index was negative, at -0.16.

Although the devaluation of the Rand plays an important role in making the prices of South African products more competitive, this is not the only reason for the improvement in competitiveness. Sharper business skills, high quality products and improved productivity within the agricultural sector have made an equally important contribution towards improving the competitiveness index of the agricultural sector of South Africa.

There is already evidence of a strong correlation between investment in a sector and the competitiveness and business confidence of that sector. Real investment in agriculture has also increased by 7% from 1999 to 2000 (Esterhuizen, Van Rooyen & Doyer, 2002). This is good news considering that there had been a negative trend in investment in the agricultural sector since 1997.

## **6. CONCLUSION**

An index was developed to determine the confidence of agribusinesses operating in the agricultural sector of South Africa. The objective of such an index is to determine the business confidence of agribusinesses as accurate as possible. The index can then be used in management and policy processes. Confidence indexes of other countries were also investigated. The index is published on a quarterly basis, and the first index was released in 2001. About 80 agribusinesses are participating in conducting the **AGRIBUSINESS CONFIDENCE INDEX**.

For the first quarter of 2002 the **AGRIBUSINESS CONFIDENCE INDEX** points to a 20% improvement in the business confidence of South African agribusinesses compared to the same period last year, and for the second and third quarter of 2002 a 14% and 10% increase respectively in business confidence compared to the second and third quarter of 2001 were realized. This increase in confidence goes hand in hand with some other positive trend in the agricultural sector of South Africa re: competitiveness and investment.

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