

The income transfer effect of crop estimates: Implications for food security¹

By Jannie de Villiers and André Jooste, respectively from the National Chamber of Milling and the Department of Agricultural Economics at the University of the Orange Free State

Introduction

Since the introduction of the Marketing of Agricultural Products Act (no 47 of 1996) South Africa has deregulated all its former control boards. This, together with the move towards a more liberalized market, has brought about a freer market environment for agricultural products in which prices are determined by a variety of factors. Within this dynamic environment producers and agri-business are not only exposed to production risks, but also to greater price risk and increased competition. This off course entails that much more emphases are put on planning in respect of how much to produce, where to produce, how much inputs to procure at what price, etc. Eventually decisions on these issues will be absorbed in the marketing system where prices of final products are determined. The price setting arena has become one of the most important aspects of marketing. Not only has it an influence on the returns of farmers and agri-business, but it has wider implications for national welfare – and taking a narrower focus – also on household food security.

It was estimated by the Committee for the Development of a Food and Nutrition Strategy for Southern Africa (1990) that there were around 16,3 million people in South Africa with an income lower than the minimum subsistence level. According to the Ministry of Agriculture and Land Affairs (1996) some 30 to 50 per cent of the South African population has insufficient food, or is exposed to an imbalanced diet, as a result of low income. In an economy where real income tended to move sideways due to unstable economic growth “wrong” price signals can seriously impede on efforts by government to address food security at national and household level.

Eicher and Staatz (1990) states that food security is related to both pricing policy and technological change in agriculture and are best addressed within a framework that takes account of the linkages among the various sectors of the economy. They went further by stating that research and empirical experience during the 1980s demonstrated that focusing on only one side of the food security equation failed to alleviate food insecurity, i.e. both the demand and the access side need to be addressed. Taking cognisance of the aforementioned the aim of this paper is to enhance the debate concerning food security in South Africa by focusing on the implications and importance of a proper crop estimate for South Africa. The paper does not attempt to evaluate the accuracy and difficulty in estimating crops in South Africa since it justifies a study on its own. Furthermore, this study will mainly focus on white maize due to its strategic importance for South Africa in terms of food security.

Crops estimates and its role in the South African white maize market

The crop estimates done by the National Crop Estimating Committee (NCEC) did not play a major role in agriculture, and in the price formulation of white maize in the previous dispensation. Surpluses or shortfalls were covered by the marketing schemes governed through, amongst others, the Maize Board, and government assumed responsibility for all imports and exports. The price risks involved were for the account of government. The fixed price schemes governed by the Maize Board guaranteed a fixed price to the farmer, as well as, to the consumer. The market was not allowed to operate on fluctuations, decline in demand, or increase in supplies. It was purely manipulated by the government.

Even the composition of the National Crop Estimates Committee did not matter in the old dispensation, the Crop Estimates Committee under the auspices of the National Department of Agriculture consisted of officials of the grain control boards, producer organisations, co-operatives and officials of Agricultural Research Council institutes. At the time when the new Marketing of Agricultural Products Act of 1996 came into effect and the demise of the grain control boards, a whole new dispensation appeared. This presents new challenges for all role players.

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The usage of maize for human consumption is unique to this part of the world and its relative unavailability is a major concern for great sensitivity in the procurement divisions of milling companies as they fulfill the role of value adding in the marketing chain. These companies must adhere to the requirements set by the consumer. South African consumers indicated in the past, in drought (short) years, their dissatisfaction with a blend of white and yellow maize (National Association of Maize Millers, various years). There is, therefore, tremendous pressure on milling companies to secure enough white maize for their particular customers. Not only could a miller lose his trademark should he run out of white maize and his competitors not, but it also holds implications for profitability. Crop estimates are therefore of critical importance for this sector, and for consumers at large.

Research procedure

An ordinary least square (OLS) estimation was used to determine the influence of different white maize crop estimates with respect to possible income transfers. An equation was specified with the price of white maize as dependant variable and the quantity of white maize derived from different crop estimates since 1997 as independent variable. This implies that the estimated demand variable represent a flexibility as opposed to an elasticity in a logarithmic equation. According to Tomek and Robinson (1990) the price flexibility concept is particularly important for agricultural products. This stems from the fact that variations in price within a specific year have very little influence on the size of production in that year. Conversely, the level of production is one of the main factors determining average prices in a specific year (Tomek and Robinson, 1990). Ortman (1982) supports this notion by stating that supplies to the market are determined in advance of current prices. Therefore, the price flexibility coefficient measures the percentage change in price that is associated with a percentage in quantity, *ceteris paribus*.

Tomek and Robinson (1990) states that the price flexibility coefficient is under some conditions approximately equal to the reciprocal of the corresponding price elasticity. However, due to the fact that in many cases different variables are held constant when estimating either a flexibility or an elasticity, the reciprocal of the flexibility is not always a good approximation of the elasticity. In fact, Ortman (1982) states that for the one to be the inverse of the other, the coefficient of determination (R^2) must be equal to one, and since this is never achieved in practice, the inverse of the price flexibility does not serve as a good estimate of the corresponding elasticity.

Data used

With the introduction of agricultural products on the South African Futures Exchange (SAFEX) producers and consumers (agri-business) are afforded the opportunity to trade various agricultural products in an effort to hedge price risk brought about by the free market environment. Maize in general is probably one of the most prominent products traded on SAFEX. Its prominence has grown to such an extent that prices of maize realized on SAFEX can be regarded as the market barometer for white maize prices over the short term. At the conclusion of a contract, the buyer usually hedges their risk by buying SAFEX contracts. The prices of SAFEX fluctuate as the crop quantity and quality information became known.

Hence, white maize prices as quoted by SAFEX five days after the respective crop estimates was published by the National Department of Agriculture (NDA) was used. The monthly consumer price index as provided by the NDA (1999) was used to deflate the white maize price.

Table 1 shows the crops estimates for white maize since 1994/95 as provided by the National Crop Estimates Committee (NCEC) of the NDA. It is clear from Table 1 that the white maize crop estimate have, on average, been underestimated by almost ten percent.

Table 1: Crop estimates for white maize

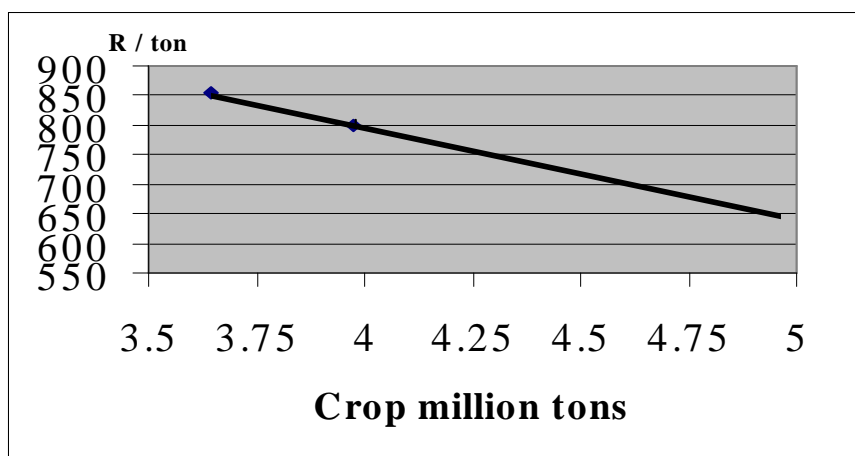
Estimates	1994/95	% of crop	1995/96	% of crop	1996/97	% of crop	1997/98	% of crop	Average deviation	1998/99
20 Feb	2 170 000	102	5 284 000	91	4 028 000	79	4 057 000	87	90	4 420 000
20 March	1 947 600	92	5 250 000	90	4 139 000	81	4 376 000	93	89	3 571 500
20 April	2 011 900	95	5 250 000	90	4 139 000	81	4 459 000	95	90	3 523 000
20 May	2 051 600	97	5 292 000	91	4 139 000	81	4 404 000	94	91	3 569 000
20 June	2 051 600	97	5 334 000	91	4 333 000	85	4 361 000	93	92	3 642 000
20 July	2 051 600	94	5 440 000	93	4 516 000	88	4 313 000	92	92	000
20 Aug	1 937 000	91	5 440 000	93	4 614 000	90	4 383 000	94	92	
CROP	2 119 718		5 836 000		5 126 000		4 682 000		90.85	

Source:NDA, (1994/95 to 1998/99)

Results

The price flexibility coefficient was derived at -0.71. The sign of the coefficient correspond to that of demand theory, and is an indication of the inverse relationship between price and quantity. The price flexibility coefficient means that a one per cent change (decrease/increase) in the size of the crop will result in a 0,71 per cent change in the price of white maize (increase/decrease). The coefficient of determination (R²) was estimated at 0,50. The associated t-value was highly significant at -4.0220 (ρ=0,0009), whilst the Durban-Watsin test proved to be inconclusive. Figure 1 depicts the relation between prices and quantities.

Figure 1: Relation between SAFEX prices and different crop estimates



Source: NDA and SAFEX (various years)

The implication of the above results are that if one assume that the June 1999 white maize crop estimate of 3 642 000 tons is 9,15 per cent below what it actually should be (3 975 243 tons), one would expect the actual price of R855/ton as quoted on SAFEX to decrease to R799,45/ton. This is R55.55/ton lower than the quoted price. Taking the amount of white maize processed in 1998/99 (National Association of Maize Millers, 1999) (3 600 000 tons) it can be derived that the under estimation could cost the consumer in the region of R200 million per annum. Should the crop estimates be over- and under estimated, over time, this result would have been, on average, zero. However, the consistency of the under estimation is transferring money from consumers to producers because of the implications as set out in the model above.

The question may therefore rightfully be asked whether the South African consumer can afford this state of affairs. Furthermore, under-estimations of this nature also limits South Africa’s ability to earn foreign exchange through exports. The availability of maize as well as the timing of selling it on to the international market, is of utmost importance.

The need for information

Kohls and Uhl (1990), write in their book on '*Marketing of Agricultural Products*':

*'Why should the public support a market information program for farmers and food marketing firms? There are two principal justifications for this public support. First, although farmers and food marketing firms are the direct beneficiaries of the programs, ultimately there are benefits to the consumer as a result of increased market efficiency and enhanced competition. Second, information has been considered a market **equalizer**, which strengthens the farmers' bargaining power when dealing with food marketing firms.'*

Due to the manner in which the South African maize market developed over time there is today still a certain level skepticism when different role players releases information. In a competitive environment the opportunity cost of questioning different role players information can become very costly. Therefore, the government has to play a decisive role in supplying timely, accurate and relevant information. Elsewhere in the world, for example the USDA (United States Department of Agriculture, 1999), a properly constituted, unbiased group of statisticians and other experts are responsible for putting together the crop estimates. The NASS (National Agricultural Statistical Service) has indicated the importance of a proper crop estimate to their senate which immediately allocated additional money in order to get proper co-operation in the various States in America. They also make use of satellite imaging in an effort to improve the estimate, especially of the hectares planted. The Maize Board in the past also compiled a data bank via satellite images with the Institute for Soil Climate and Water. The time has arrived that serious thought must be given to the manner in which crops are estimated. In this regard South Africa can learn extensively from, amongst other, the US.

The critics of the current crop estimates have it that the composition of the Crop Estimates Committee consists only of people involved in the supply side of grains and most of them are also involved in the trading of grain. With the new dispensation of a free market, grain co-operatives changed into trading companies, as did some producer organisations with brokerage services. It is therefore of the utmost importance that the Crop Estimates Committee consist of specialists who are unbiased and not involved or have any vested interests in the figures supplied to the market place. It would be a pity if the government does not see the importance of these figures when considering the issue of national and household food security. The prices of the staple foods like white maize and wheat are of the utmost importance to most of the poor households in South Africa. The under- or over estimation of the crop, has a substantial influence on these households. It is therefore important for the government to step in to address this market failure to ensure that consumers do not over- or under pay for their staple food. The price signals derived from the supply and demand of a product indicates to producers what and how much to plant. It is therefore also important not to over encourage the market or producers to grow products that are not in demand by consumers.

Conclusion

The results and influence of the Crop Estimates Committee in South Africa clearly indicates that there is a function for government to be played in the national crop estimates for household food security reasons. It is also of the utmost importance that the various role-players in the grain industry contribute to solving this problem. The building of capacity and sharing of skills with other countries might form part of the solution. The current efforts by the National Agricultural Marketing Council to involve other role-players in resolving this situation should, therefore, be encouraged.

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