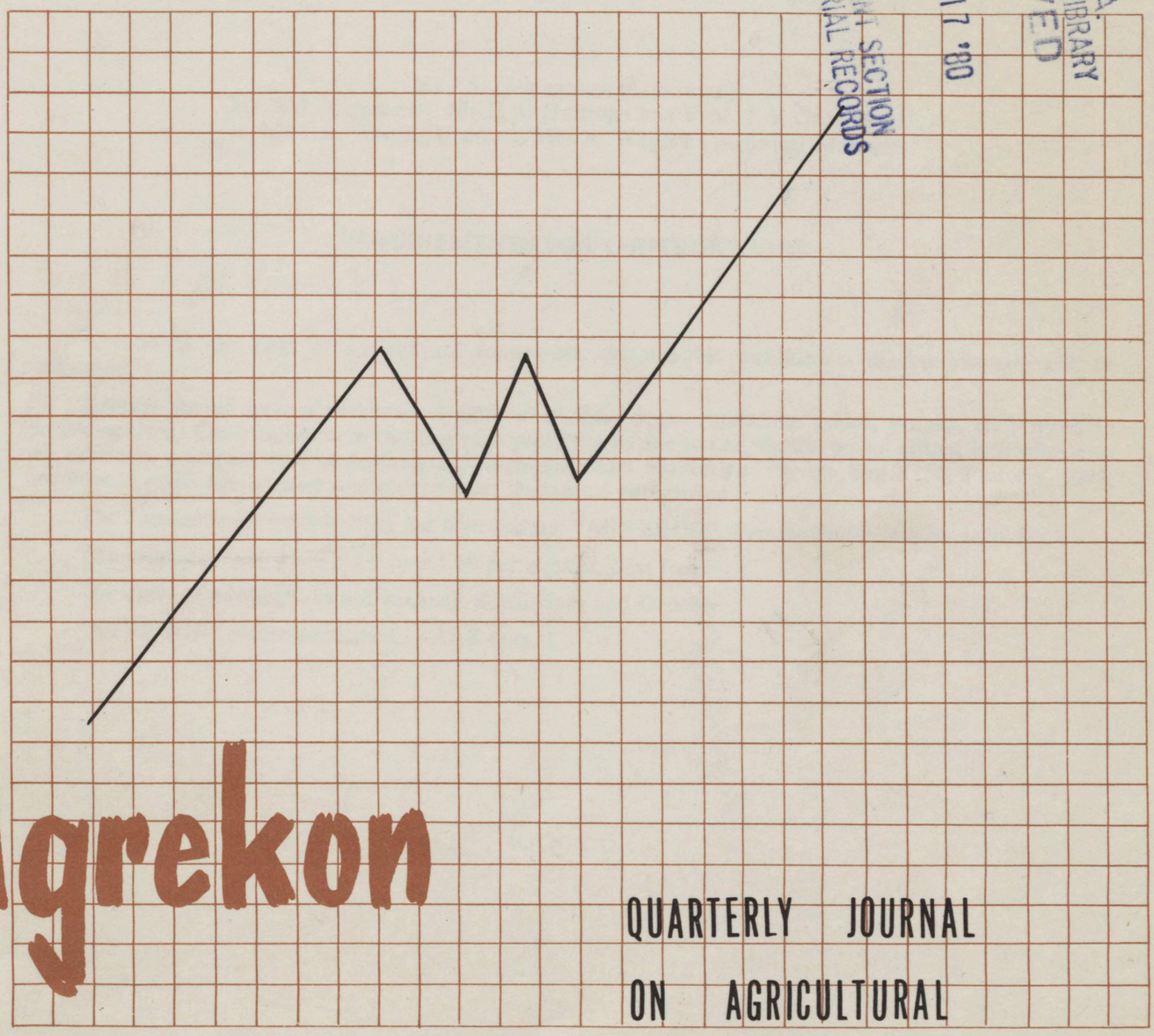
Vol. 18 No. 3
JULY 1979

Price 40c



Agrekon

QUARTERLY JOURNAL ON AGRICULTURAL ECONOMICS

Issued by the Department of Agricultural Economics and Marketing, Pretoria

COMMENTS ON THE PROBLEM OF CREATING STABILITY IN THE MAIZE INDUSTRY

by

A.P. SCHOLTZ
Noordwes-Koop Landboumaatskappy Bpk

and

F.R. TOMLINSON
SAMSO

INTRODUCTION

It is a well-known fact that all over the world there exists a greater degree of state intervention in the marketing of primary agricultural products than of industrial products.

This situation arises from the basic tendency toward instability of producer prices and incomes which is caused by the inherent problem of bringing and keeping the supply of agricultural products in balance with the demand therefor. Briefly, the underlying factors are the following:

(1) The total demand schedules of the most important agricultural products are relatively inelastic - especially in the short term and also especially with regard to price.

(2) In the same way the total supply schedules display a relatively inelastic character, especially in the short term. The reasons are, *inter alia*, that the production process is often seasonally bound and has a relatively long cycle, that switching to the production of other agricultural products is often difficult as a result of technical and/or financial reasons, and that the influence of unpredictable climatic fluctuations often, and especially in South Africa, leads to a considerable variation in the volume of production.

Viewed against this background it is understandable that producers' representations for Government measures were especially aimed at improving the producers' price bargaining power and controlling total supply.

In South Africa the representations resulted in the passing of the Marketing Act in terms of which control boards were established with authority over the marketing of the most important agricultural products.

The main objects of the Marketing Act are to promote stability in the prices of agricultural products and to narrow the gap between producer and consumer prices through rationalisation. In this manner productivity in the farming sector and efficiency in agricultural marketing would be improved.

In this paper attention will especially be focused on certain aspects concerning price stability in the maize industry and the implications that instability of production has in this respect.

CONTROL OF MAIZE MARKETING IN SOUTH AFRICA

In order to facilitate later discussions it is necessary to give a brief review of control measures with regard to maize marketing in South Africa as well as of the physical volumes involved. The outstanding characteristics of the marketing scheme administered by the Maize Board to improve stability in the maize industry are the following:

One-channel marketing: A one-channel marketing system is implemented in the main producing area (which is designated as area A and comprises the provinces of the Transvaal and the Orange Free State as well as a few magisterial districts in the Northern Cape and Natal).

The Board, as the only buyer of maize from producers, does not itself handle maize, but appoints agents to perform this function at seasonally determined rates of handling and storage remuneration. These expenses are covered by the Board's margin. Through the one-channel marketing scheme the Board directly controls approximately 99% of all maize marketed by producers.

As far as sales on the local market are concerned, agents are allowed to sell small quantities directly to buyers in their immediate vicinity. Large orders from grain millers and distributors, however, have to be placed with the Board which then allocates the maize to well-placed agents.

After providing for the needs of the local market, the Board sells the surplus, if any, for export. Normally these sales are made by public tender according to a pre-published programme. In exceptional cases the Board sells directly to state and semi-state institutions abroad.

The Board endeavours to minimise the total transport costs of the industry by eliminating cross haulage of maize.

From information on the total crop, quantities marketed by producers, the Maize Board's sales for local use and exports it is clear that crop sizes and quantities marketed during the

period 1963/64 - 1977/78 maintained a strong upward trend although the annual crop fluctuated considerably. For example, the average annual crop increased from approximately 5 million tons in the early sixties to approximately 8,5 million tons in the last few years. Sales for local consumption in the same period also increased strongly, but more consistently, from approximately 2,7 million tons to approximately 5,7 million tons per annum. Exports reached sizeable volumes but fluctuated sharply from year to year.

Fixed producer and selling prices: The Board's producer and selling prices are fixed by the Minister of Agriculture at the beginning of each marketing season. These prices normally remain constant for the whole season.

For the determination of the producer price, the expected realisation by the Board on the local as well as the export markets is taken into account.

Because maize is a staple food, the Government has for many years paid a consumer subsidy on it. The amount thereof, which is normally equal to the Board's margin but has been smaller as well as larger than the margin at times, is taken into account by the Board when fixing its selling price for local consumption.

The Board's margin as a percentage of its total costs increased gradually, though moderately, from 10,9 % in 1963/64 to 13 % in 1975/76, and subsequently decreased to 11,8 % in 1977/78. Considering the significant increase in costs resulting from the extension of bulk storage facilities, as will be shown later, this is a satisfactory achievement.

Stabilisation fund: In 1954, when it became clear to the Board that future exports would take place at a loss instead of at a profit, the Board established a stabilisation fund. The unused balance of earlier export profits was used as a nest egg and further contributions to the fund were to be made from time to time by producers, consumers and the Government according to the needs of the fund. The responsibility of each party would be determined in the light of existing circumstances and its ability to contribute.

Although the fund was primarily used to cover losses on exports, it was never intended to be used solely for this purpose. In the opinion of the Board, as well as the Minister of Agriculture, the fund could, when circumstances so require, be used for other measures aimed at stabilising the industry. Thus the Board made distress payments and export dividend payments to producers in three recent years, and subsidised its selling prices from the fund in four recent years.

Application of grading and storing standards: The Board supervises the application of the official regulations governing grading and storing. The Board also advises the Department of Agricultural Economics and Marketing on the issue of permits for the erection and utilisation of bulk storage facilities and the allocation of funds for this purpose.

In the period 1965/66 - 1977/78 the capacity of bulk storage facilities of the Board's agents increased from 1,4 million tons to 7,9 million tons - an increase of 471 %. The construction costs per ton capacity increased from approximately R20 in the early sixties to approximately R39 in 1977/78 - i.e. by 95 %.

The promotion of development: The Board may use its funds, with the approval of the Minister of Agriculture, to promote the use of maize as well as productivity in all facets of the industry - *inter alia* by supporting research. Much has already been done in this respect by the Board, particularly in collaboration with the Department of Agricultural Technical Services and the CSIR.

Producer majority on Board: All the important sectors of the maize industry are represented on the Board. However, producer representatives are in the majority on the Board (previously 12 out of 21, presently 8 out of 13).

From the above it is clear that the Board's responsibilities cover almost the complete spectrum of the marketing function. In modern marketing theory the controllable factors are classified under the so-called "4 P's" - namely factors relating to place, product, price and promotion. Of these, price factors are undoubtedly the most important but also the most difficult in the case of such a huge industry as that of maize with its many diverging conditions.

INCOME CONSIDERATIONS

Income objectives form part of the primary objectives of agricultural policy, and price objectives are secondary objectives for the attainment thereof. Income objectives are normally expressed in terms of the following:

(1) That agriculture receives a fair share of the national income.
(2) That agriculture's share be divided among farmers on an equitable basis.
(3) That sharp fluctuations in agricultural income, resulting from the inherent unstable supply/demand relationship in agriculture, should be minimised.

Modern production techniques, coupled with an ever-increasing measure of mechanisation, necessitate increasing cash outlays in regard of inputs. As the price of these inputs are also still increasing sharply the maize farmer's financial risk also increases tremendously and consequently also the minimum cash income annually required by him to remain in production and to maintain a reasonable standard of living.

The importance of a reasonable degree of income stability for the maize farmer therefore increases continuously.

Because crop sizes fluctuate considerably from year to year as in the case of maize, this need for income stability is in conflict with the objective of price stability which is the corner-stone of the Marketing Act and its consequent control schemes.

DEGREE AND NATURE OF INSTABILITY IN SUPPLY

The area planted annually to maize on farms of Whites reveals only slight fluctuations. With the exception of the 1973 crop, which was produced on only 3,6 million ha because of serious drought conditions that prevented planting on the normal scale, the annual area planted in the period 1963/64-1977/78 varied between the lowest figure of 4,2 million ha and the highest figure of 4,7 million ha. The land input of entrepreneurs in the maize industry therefore does not constitute an important contributory factor to instability in either the interseasonal or the long-term supply of maize.

According to the average yields obtained in the agro-economic regions B1 (Eastern Transvaal Highveld), B5 (North-Western Free State), B4 (Western Transvaal) and total farms of Whites in the Republic and an analysis of the year to year changes from 1963/64 to 1977/78, the average year to year change, expressed as a percentage of the previous year, comes to 34,5 % which reflects a very high degree of instability. The annual changes varied between a maximum negative change of 46,8 % and a maximum positive change of 116,4 %.

An extract of the particulars is given in the following table. According to those figures the average year-to-year change in the three agro-economic regions compares as follows with that of farms of Whites:

TABLE 1 - Comparison of year to year changes in average yield in three agro-economic regions and total farms of whites

Year to year change	B1 Eastern Highveld	B5 Tvl, North-Western Free State	B4 Western Trans-vaal	Total farms of Whites
Average 1963/64 to 1977/78	(%) 39,1	(%) 53,0	(%) 52,8	(%) 34,5
Maximum positive change	145,1	178,1	257,1	116,4
Maximum negative change	- 40,6	- 67,8	- 64,6	- 46,8

From these figures it is clear that the variation in yields is much bigger in the individual regions than in the average for the farms of Whites.

A further deduction that can be made is that sizeable differences exist in the variations within the regions. Thus the Eastern Transvaal Highveld shows a noticeably less unstable pattern in yields that the other two regions.

Furthermore, it is significant that the sign (positive or negative) of the year to year change in yield of the different areas in a specific year frequently differs. This means that in a specific year, producers in one area may often experience outstandingly good crops while those in other areas experience poor crops, and vice versa.

DEGREE OF PRICE STABILITY ACCOMPLISHED

To what extent the Maize Board managed to achieve price stability can be deduced from Table 2.

From Table 2 it is evident that the Board succeeded to a large extent in stabilising the selling price of white maize while the stabilisation of the gross producer prices was highly successful and the stabilisation of the net producer price was reasonably successful.

Although the average year to year change in export prices does not seem to be excessive, the limits between which prices fluctuated are considerably wider than in the case of the other prices.

Due to the importance of the export realisation in the determination of the net producer price, this phenomenon probably complicated the maintenance of stability in the net producer price.

A comparison between the variations in yields and net producer prices (according to Table 1 and 2) indicates much greater stability in prices than in yields. Consequently, it can be expected that producers' gross incomes and margins will necessarily vary to a great extent.

DEGREE OF INSTABILITY IN ENTERPRENEUR'S REMUNERATION

Although price levels as such are important to the producer, it is the profit component of the price that is ultimately of critical importance to him. Consequently, it is also necessary to examine the year to year movements thereof. Furthermore, it is necessary to look at the difference between the intended profit according to the price determination and the effective profit according to the real situation.

For this purpose calculations were made of the production cost per ton of maize based on the yield accepted for price determination purposes (basis 1) on the one hand and on the combined actual average annual yield achieved in the three representative agro-economic regions (basis 2) on the other. The difference obtained when the production cost so calculated is deducted from the net producer price, represents the gross margin of the producer and gives an indication of his entrepreneurial remuneration.

It appears that there are obvious differences within seasons between the gross margins calculated according to the two bases. On the one hand the effective gross margin (basis 2) frequently deviates considerably from the intended gross margin (basis 1). On the other hand, the percentual year to year changes in the effective gross margin (basis 2) are significantly higher than those of the intended gross margin (basis 1) - the average value being 76,6 as against 16,6. In the case of the effective gross margin (basis 2) the percentual maximum negative deviation is -74,7 and the maximum positive deviation 365,1. The comparable limits for the

TABLE 2 - Average year to year changes in some controlled maize prices and in export prices during 1963/64 to 1977/78

Year to year change	Selling price for large quantities of white maize	Gross producer price for yellow maize	Net producer price for yellow maize	South African export price (F A E) for yellow maize
Average (%)	6,2	7,9	9,8	15,3
Largest positive change (%)	21,2	20,0	31,5	58,0
Largest negative change (%)	- 0,8	- 6,8	- 7,4	- 16,8

intended gross margin (basis 1) are -16,9 and 61,5, respectively.

Superficially it seems as if the intended gross margin (basis 1) in R/t shows an upward trend which gives the impression that the entrepreneur's remuneration increased. However, the calculated production costs in R/t also show an upward trend, and for a proper evaluation the gross margin was expressed as a percentage of the net producer price. This figure shows in the case of the intended gross margin % (basis 1) for the period 1963/64 - 1972/73 a reasonably stable pattern around a value of about 40, then a single sharp increase to 49,4 in 1973/74, after which it shows a constant sharp decrease to 25,6 in 1977/78.

The gross margin % (basis 2) displays a much more unstable pattern around an average value also of 40 in the period 1963/64 - 1972/73 with a sharp decline to 16,4 in 1973/74 followed by an even sharper increase to 69,2 in 1974/75, after which it also sharply decreased to 38,2 in 1977/78.

The limits between which the percentual values fluctuated are appreciably wider in the case of the effective gross margin % (basis 2) than in the case of the intended gross margin % (basis 1) - between 15,9 and 69,2 compared with 25,6 and 49,4, respectively.

It is clear therefore that the effective gross margin fluctuated considerably more and was therefore appreciably more unstable than the intended gross margin according to the price determination, while both margins displayed sharp decreases in the last few years.

From the above analysis it is clear that the producer's exposure to financial risks increased appreciably as the calculated production cost in R/t increased, while the gross margin, which *inter alia* has to compensate the producer for this increasing exposure, decreased relatively sharply. This poses a serious threat to the economic survival of the producer and should be properly taken into account by the price-fixing authorities.

THE DILEMMA OF THE PRICE-FIXING QUTHORITIES

From the viewpoint of stability, the problem confronting the price-fixing authorities is whether there should be a shift in the emphasis of policy toward giving preference to income stability and implementing it by allowing producer prices to fluctuate from year to year in an inverse relation to the fluctuation in crop sizes.

Apart from the probable detrimental effect that corrective interseasonal price fluctuations will have on the distribution of income between producers, it also holds important disadvantages for the processors and consumers of maize, particularly if it is taken into account that maize is not only the staple food of the lower income group in the country but also an important input of the animal production industry in agriculture. It does not require much imagination to anticipate the disruptive effect of large price fluctuations on these market segments.

Apart from this, the range of the probable price fluctuations is so drastic that it will never be practical politics. The average percentual year to year change in the size of the crop for the period 1963/64 to 1977/79 comes to 39,0 with a maximum negative deviation of 56,1 and a maximum positive deviation of 166,9.

Although it may be advisable for the price-fixing authorities to allow corrective interseasonal price fluctuations on a more purposeful basis in the future than it did in the past, supplementary measures will be necessary to accomplish a significant degree of income stability.

POSSIBLE SUPPLEMENTARY MEASURES

Stabilisation fund: As stated, the stabilisation fund was used in recent years to combat interseasonal instability in the income of producers and the Board's selling prices. The question can be asked if the fund should not be used to a greater extent and on a more continuous basis to achieve greater income stability for producers.

If the measures contemplated should be implemented by collecting levies from producers in years of good crops and making payments to them in years of poor crops based on the quantities marketed in years of reasonably uniformly distributed crops, better results can be obtained in this way than by ordinary adjustments in the producer price. Not only is the additional income distributed on a more equitable basis among producers in a poor year, but a measure of tax saving also attaches to such a levelling of income.

However, there are certain problems involved in such an approach. Firstly, the magnitude of interseasonal shift in income must be considerable and in times when producers have to cope with sharply increasing production costs, such renouncement of immediate income will be unacceptable.

Secondly, and linked to the preceding, the interest earned by the fund is comparatively low while the interest paid by producers is comparatively high. Furthermore, if the unfavourable effect of inflation on the purchasing power of money is taken into account, the interests

of producers will be significantly harmed if the accumulation of levy funds continues for a number of years before payments are made.

In view of the abovementioned, measures of this nature cannot be seen as an effective solution.

Comprehensive crop insurance: The crux of the matter is uncontrollable fluctuations in crop size that are strongly linked to natural factors. It would appear therefore as if the most appropriate supplementary measure would be a comprehensive crop insurance scheme on a broad geographical basis.

If producers can obtain cover at a reasonable premium tariff, meaning cover at least equal to the cash oulay on a particular crop, this can have an important stabilising effect on income. Because shortages as a result of crop damages are handled on an individual basis, this measure will be more effective than an allowance in the price - because the latter does not provide sufficient compensation to those producers with a shortage, while those with good crops receive a compensation to which they are not really entitled.

The South African Agricultural Union has already submitted proposals to the Government for the establishment of a voluntary comprehensive crop insurance scheme and this is presently being considered.

Mindful of the tight financial squeeze to which producers are exposed in cases of crop failures, the improvement in cash flow that such producers will obtain through insurance will bring great relief and improve their chances of economic survival considerably. Naturally, this will also lighten considerably the financial burden of the Department of Agrigultural Credit and Land Tenure, the Land Bank, agricultural co-operatives and the commercial bank sector.

SUMMARY

The findings in this paper can be summarised as follows:

1) A high measure of instability exists in the total supply of maize. This arises mainly from unplanned variations resulting from natural factors which are also distributed very unevenly over the production areas.
2) The price-fixing authorities brought about a reasonably high degree of interseasonable price stability.
3) A high degree of instability exists in the income of producers while their annual cash oulay has increased faster than the average yields. Producers' exposure to financial risks have therefore increased appreciably.
4) In spite of this increased exposure, producers' gross margin has decreased relatively sharply during recent years. This holds serious dangers for the economic survival of producers and should receive the serious attention of the price-fixing authorities.
5) Due to the large fluctuations in supply, it will be difficult to stabilise incomes completely by means of levelling price fluctuation. Price flexibility can nevertheless be applied in practice on a limited scale.
6) Comprehensive insurance can make a valuable contribution towards stabilising producers' income and can offer them additional protection against the financial squeeze originating in crop failures.