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FARM-RETAIL PRICE SPREADS FOR BEEF IN SOUTH AFRICA

by W.L. NIEUWOUDT and H.P. VEENSTRA*

1. INTRODUCTION

The principle aim of this article is to examine the nature, aims and relevance of marketing margins with regard to beef on a monthly basis from August 1974 to December 1981. Since data for this article have been obtained from the Department of Statistics and the Meat Board, the controlled areas will be studied.

In South Africa detailed statistics prior to 1974 did not specifically penetrate into the field of margins. Since 1974, however, the food basket system has been used to convert statistical price data to the needed margin data. The provision of satisfactory estimates therefore depends partly on adapting available information and partly on amending present procedures so that the statistics can serve the aims of margin analysis as well as their original purposes.

2. MARKETING MARGINS

The marketing margin refers to the difference between prices at different levels of the marketing system (Dahl and Hammond, 1977). The marketing margin is also known as the farm-retail spread, since it is the gross margin received by marketing firms and consists of their costs and profits. In a sense, therefore, the marketing margin is the price of all utility-adding activities and functions performed by food marketing firms (Kohls and Uhl, 1980).

It is widely believed that the large marketing margin reflects "too many" middlemen and that the margin could be reduced by eliminating middlemen. More correctly, however, the size of the marketing margin depends upon the number and costs of marketing functions performed rather than the number of middlemen.

The general aim of margin studies can range from the provision of information to the more precise purpose of recommending or assessing the consequence of policy measures (OECD, Paris, 1981). Margin studies, however, do not necessarily lead directly to specific decisions being taken by individuals, firms or public bodies but generally seek to achieve greater market awareness so that anyone interested can see what is happening and react accordingly.

3. ESTIMATING MARGINS

Three approaches to margin estimation may be identified, namely the sectoral, functional and product approaches. As all three relate to the same broad area of investigation some of the methodological problems are common but each approach has distinctive features which are reflected in the procedures normally followed.

(a) The sectoral approach

The sectoral approach is concerned with the study of food margins as part of the estimation and analysis of the social accounts of the national economy. Thus, within these accounts, sectoral tables may show the size of the food sector and reveal the importance of food processing and distribution within that sector (OECD, Paris, 1981). Although the approach is not sophisticated, it is an appropriate way of showing broad trends within the food economy, including changes in proportionate shares of different activities or product groups. The approach is thus predominantly concerned with the level and behaviour of the nation's total food marketing bill.

(b) The functional approach

The functional approach to margin analysis takes as its object of study various forms of economic activity, such as processing and retailing, and examines the various factors which influence the performance and development of the firms and organisations in the activity (OECD, Paris, 1981).

(c) The product approach

Since the product approach is used in calculating the necessary data for the purpose of this article, a brief outline of the complications when dealing with beef, mutton and pork should be given.

Various definitions of the term "product" are conceivable and in practice estimation procedures usually relate to a group of similar products rather than to a single product in the strict sense of one commodity embodying one constant set of utilities.

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Beef, for instance, may be regarded as a single product although it consists of cuts of various qualities (OECD, Paris, 1981).

The product approach assumes that there is a commodity, a unit of which can be identified and its price measured at the farm and retail stage of the food chain. The difference in these two prices is defined as the unit margin or farm-retail spread and can also be expressed as a percentage of the farm or retail value, namely the percentage margin.

In the case of beef, transformation coefficients and conversion factors will need to be estimated and account will have to be taken of any by-products. The steps in calculating the farm-retail spread for beef as a specific product are:

(i) Record the price of beef at the retail level. This price is a weighted average price of retail cuts from a beef carcass.
(ii) Calculate the gross value of a steer at the farm level.
(iii) Estimate the value of edible and inedible by-products.
(iv) Subtract the value of the by-products from the gross farm value to get the net farm value.
(v) Subtract the net farm value from the retail price to get the farm-retail spread.
(Source: USDA/ESCS (20)).

4. FACTORS AFFECTING SPREADS

Changes in the farm-retail spreads over a period of time are determined mainly by changes in the cost of all factors involved in processing and distributing. The margin or spread between retail cost and farm value represents an accumulation of charges made by agencies moving products from the farmer to the consumer. The size of the farm-retail spreads over periods of time are determined by changes in farm and retail prices. It should be realised, however, that the size of the margin is not necessarily a guide to the efficiency of marketing (Hallet, 1981).

Efficiency, however, is often used in evaluating the performance of the marketing process. It reflects the consensus that outputs of the marketing process should be produced efficiently (Downey and Trocke, 1974).

5. RETAIL, AUCTION AND PRODUCER PRICES FOR BEEF

For the period studied, Fig. 1 illustrates the monthly relationships between retail, auction and producer prices for beef for the period 1974 to 1981. All prices have been deflated monthly by the consumer price index.

In real terms, both retail and auction prices decreased between 1974 and the middle of 1980. This has been substantiated with the use of linear regressions showing highly significant negative relationships for both retail and auction prices over the period 1974 to July 1980.

The retail price of beef is less susceptible to price fluctuations than are auction prices (Fig. 1). In the short term (monthly observations) retail prices do not fluctuate in direct sympathy with auction prices, i.e. seasonal variation is not as pronounced. However, in the medium and long term, retail prices adapt to auction price. According to Fig. 1 retail prices follow auction prices with a one month lag. Higher prices predominate during November, December and January (Table 1), showing distinct seasonality.

There is sometimes a debate over whether farm prices are determined at the farm level in the marketing system or by consumers at the retail level. Kohls and Uhl report that retail prices may in actual fact follow auction prices, contrary to what economists believe. This impression is reinforced when a change in retail prices follows on the heels of a change in farm prices. With the floor price scheme, therefore, manipulation of quotas directly influences prices at the auction level, thus determining the retail price.

The following may therefore be concluded from Fig. 1 and Table 1:

(i) The greatest impact of a change in auction prices or retail prices occurs in the first month of the change, with the full impact spread over a number of months;
(ii) retail prices respond equally to both rising and falling farm prices.

6. FARM-RETAIL PRICE SPREADS

The farm-retail price spread is another measure of the marketing margin. It is the gross return per retail unit to the food marketing system for its activities and functions (Kohls and Uhl, 1980). Therefore farm-retail spreads are not simply the difference between the retail price per unit and the farm value of an equivalent amount of food sold by the farmer. Unlike the marketing bill, which provides an aggregate view of the division of consumer food expenditure between farmers and food marketing firms, farm-retail price spreads allow a more detailed view of this division for individual food products.

Fig. 2 illustrates the farm-retail price spread where the data have been deflated monthly by the consumer price index.

In real terms the farm-retail price spread has decreased from August 1974 to July 1980. This has been substantiated with the aid of linear

TABLE 1 - Average monthly retail and auction prices for beef from 1974 to 1981 (c per kg)

Month	J	F	M	A	M	J	J	A	S	O	N	D
Retail price	84,6	83,8	83,2	82,8	82,9	81,6	81,1	80,6	81,5	82,7	83,4	83,9
Auction price	56,7	55,1	53,0	52,2	51,2	52,1	52,2	53,0	54,1	55,8	56,1	58,7

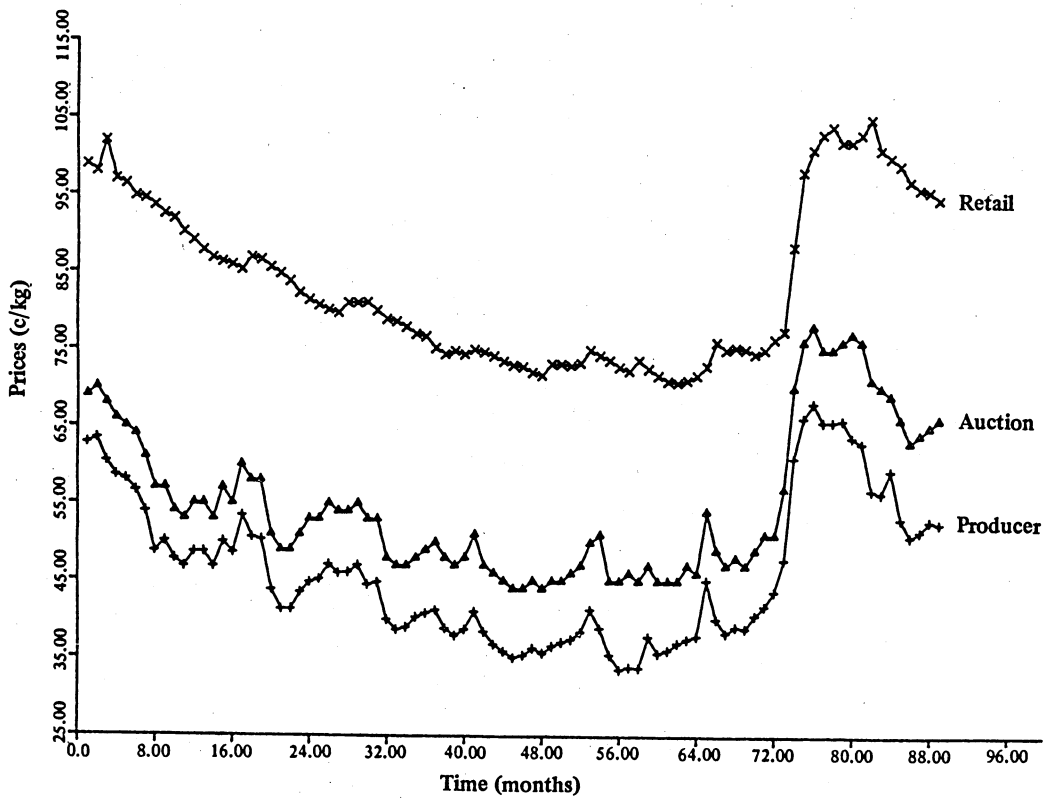

FIG. 1 - Retail, auction and producer prices for beef between 1974 and 1981 (1970 = 100)

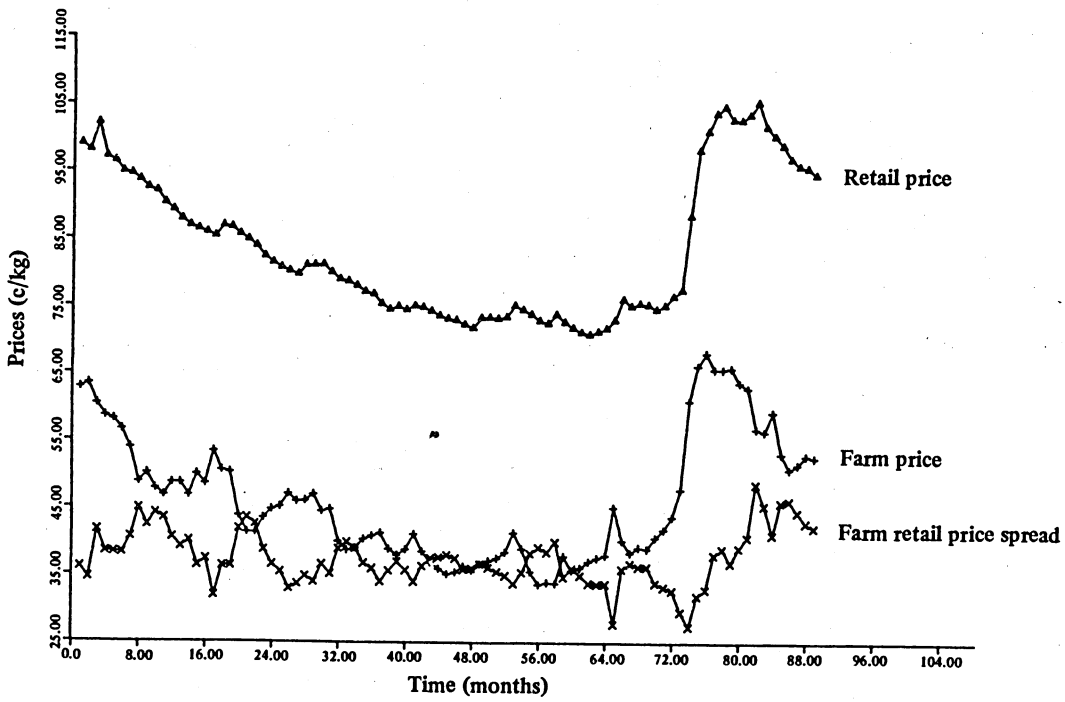

FIG. 2 - Retail and farm prices and farm-retail spreads for beef between 1974 and 1981

regressions, which show a highly significant negative relationship.

The farm-retail price spread is high when auction prices are low and vice versa because retailers tend to keep their prices constant. The farm-retail spread consists of the marketing cost incurred by the farmer in selling his product and the gross margin received by marketing firms, together with their costs and profits (Kohls and Uhl, 1980).

According to Fig. 1, the producer and auction prices move in sympathy with each other. The difference between the auction price and the producer price is the marketing cost incurred by the farmer in selling his product. Since marketing costs in the short term are fixed, marketing costs as a percentage of the auction price are highest when auction prices are low. Marketing costs can represent as much as one quarter of the auction price.

With regard to absolute and percentage margins, the coefficient of variation is slightly higher for the percentage margin, 8,9 per cent as against 8,3 per cent. This, however, is expected since the retail price is more constant than the auction and producer prices.

If the percentage margin is constant, then price elasticities at the farm and retail level would be the same. Constant absolute and percentage margins imply that the demand elasticity at the farm level for beef is lower than at the retail level, which is according to Waugh's finding. This result also agrees with Waugh's finding that "price spreads are neither constant percentages nor constant absolute amounts, but somewhere between the two" (Waugh, p.20). The coefficients of variation for the retail, auction and producer prices are 10,2 per cent, 12,4 per cent and 16,6 per cent respectively.

This indicates that producer prices are far more variable than retail prices, which is clearly shown in Fig. 1. The fact that retail prices are more constant than producer prices implies that the retailers absorb some of the cost when auction prices increase and that when the opposite happens (auction prices fall) they do not reduce their prices and reap the extra profit. The term "sticky" is sometimes used with regard to retail prices. The reason is probably that retailers are afraid to antagonise consumers by changing their prices too much from day to day since consumers are more conscious of price increases than of any fall in prices. This phenomenon explains why retail prices of beef did not fall during 1982 when auction prices fell, as was widely reported in the press.

7. THE FARMER'S SHARE

The farmer's share is computed from farm-retail price spreads and is the farm value expressed as a percentage of the retail price of food (Kohls and Uhl, 1980). The farmer's share is widely regarded as a measure of the fairness of farm prices and the efficiency of food marketing. Fig. 3 illustrates the farmer's share for the period August 1974 to December 1981. For the period from August 1974 to the middle of 1980, there was a decline in the producer share values. This was substantiated using a linear regression, which showed a highly significant negative relationship.

High producer prices result in high producer share values. Pronounced fluctuations in the producer share values occur, indicating the flexible nature of auction prices at the abattoir (See Section 5). Over a longer period (1951-1981), however, annual producer share values have been calculated using available information and partly amending present procedures. Table 2 shows the declining producer share values over this time.

TABLE 2 - Producer share values for beef, on an annual basis from 1951 to 1981

Year	51	55	60	65	70	75	80	81
Producer share (%)	68,6	62,8	59,1	57,6	57,4	58,8	50,9	57,4

Source: Department of Statistics and Meat Board journals

From 1951 to 1980 a declining trend can be seen. After 1980, the producer share value increases with a rapidly increasing price of beef. This has been substantiated using a linear regression showing a highly significant negative relationship for the period 1951 to 1980.

Thus the general decline in the producer's share may indicate an increase in either:

(i) further functions undertaken by specialist intermediaries in processing a product;

(ii) an accumulation of charges made by agencies moving products from the farmer to the consumer (Hallet, 1981).

CONCLUSION

In real terms retail and auction prices declined from August 1974 to the middle of 1980. After this the price of beef rose substantially. Retail prices are less susceptible to price fluctuations than are auction prices. Retail prices are dependent on the auction prices at the abattoir since prices at the retail level adjust after a change at the auction level. It is concluded that the greatest impact of change in auction prices on retail prices occurs in the first month of change, with the full impact spread over a number of months, and that retail prices respond equally to both rising and falling farm prices. The fact that retail prices are more constant than producer prices implies that the retailers absorb some of the cost when auction prices increase while when the opposite happens they do not reduce their prices and reap the extra profit. The term "sticky" is sometimes used in regard to retail prices.

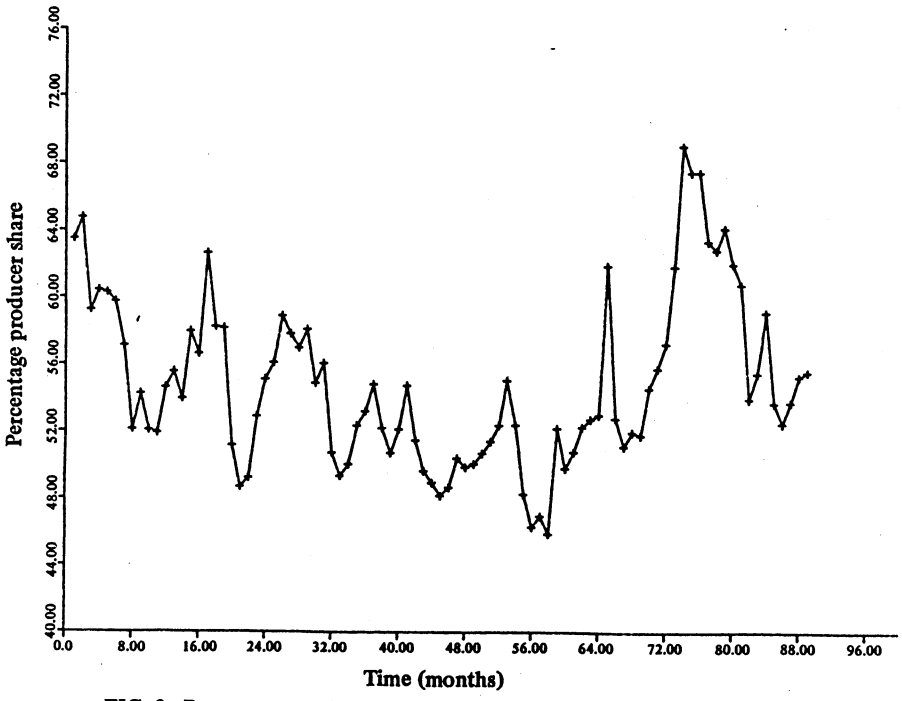

FIG. 3 - Percentage producer share values for beef between 1974 and 1981

Market margins increase with falling auction prices and decrease with increasing auction prices. Over the period 1974 to 1980, however, market margins as a percentage of the retail price have increased, indicating further functions taken by specialist intermediaries in processing a product and an accumulation of charges made by agencies moving products from the farmer to the consumer.

The farmer's share is computed from farm-retail price spreads and is the farm value expressed as a percentage of the retail price. Although widely regarded as a measure of the fairness of farm prices and the efficiency of food marketing, it in fact measures neither of these very well. The producer's share, however, has decreased for the period 1974 to 1981 and when figures are computed on an annual basis from 1951 to 1981 this trend is pronounced.

As the farm-retail price spread is another measure of the marketing margin, it not only shows the size of the margin but gives a detailed view of this division for individual food products. The importance of spreads is in the calculation of "equivalent amounts" in calculating the farm price. With rising farm prices, which are calculated from auction prices, retail-farm price spreads decrease.

If the percentage margin were constant, then price elasticities at the farm and retail level would be the same. The fact that neither the absolute margin or the percentage margin is constant implies that the demand for beef in South Africa at the farm level is less elastic than at the retail level, which is in accordance with Waugh's findings.

Thus the general aim of margin studies can range from the provision on information to the more precise purpose of recommending or assessing the consequence of policy measures.

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