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CHANGES IN THE PARITY POSITION OF SOUTH AFRICAN AGRICULTURE

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1. INTRODUCTION

Concern about the condition and more particularly, the future of agriculture is no new phenomenon. It is however, relevant to observe and analyse trends regularly. Only by doing this can crises be forecasted and/or properly understood. Only when this has been done can proper remedial action be possible.

In the present era, voices of concern are heard more frequently from responsible circles than is normally the case. In a recent speech, the President of the South African agricultural Union, for example, claimed that the financial position of agriculture deteriorated during the seventies to such an extent that farmers' risk increased, and their liquidity deteriorated. According to him, this has been a world-wide phenomenon (Wilkins, 1982).

In this article an effort will be made to obtain, with the aid of macro data, an overview of changes in production, prices and price ratios in South African agriculture. These changes will be compared to changes in other countries, and an effort will be made to identify certain policy implications on this basis. The analyses are limited to the period 1961 to 1980 for domestic analyses, and 1973 to 1980 for international comparisons.

2. CHANGES IN GROSS VALUES, PRODUCT PRICES AND PARITY IN SOUTH AFRICA

In this part of the analysis, data from the Abstract of Agricultural Statistics are processed. The procedure is to express the change between two consecutive years as a percentage of the first of the two years and to calculate therefrom mean percentages of increases and standard deviations for the periods concerned 1). Data concerning gross value and volume of production as well as producers' prices appear in Table 1.

Rates of increase in the gross value of production were considerably higher in the second period than in the first period. These higher rates of increase can directly be attributed to faster price rises, while annual production increases were slower over the second period than over the first. Gross value changes and volume changes of field crops are less stable than is the case with horticulture and livestock, as is evident from the higher standard deviations. Price changes of field crops, on the other hand, appear to be more stable than those pertaining to the other product groups. This is probably due at least partially to single-channel

fixed price schemes for summer and winter grains, whilst instability in field crop production, as shown by Du Plessis (1976, pp. 105-145) is evident especially in areas where mean yields per hectare tend to be on the low side.

According to Table 2, prices of goods purchased by farmers have also shown accelerated increases since 1971. This pertains to consumption goods as well as inputs. In addition, fuel showed the slowest increases of all input groups mentioned in the 1961 - 1971 period, but since 1971 fuel prices have risen more rapidly than those of any other group of inputs. Fertilizer prices also ranked among slow increasers in the first but one of the fastest increasers in the second period.

Fuel and fertilizers thus became cheaper relative to other inputs and to products over the first of the two periods, but became relatively more expensive in the second. Such movements may potentially require considerable adjustments in production organisation.

Increases in prices of pesticides and packing material ranked among slower price increases over both periods.

The method used to measure parity changes was to equate all prices for 1971 to 100 and then to determine what prices would have been in 1961 and 1980 if these had changed every year by the mean rates shown in Tables 1 and 2. The purpose was to limit the effects of random annual fluctuations. The parity values must be interpreted in such a way that if a value exceeding 1,0 has been obtained, the parity of agriculture had improved *vis-a-vis* the other products. A value of less than 1,0 again, reveals a weakening parity. Results appear in Table 3.

It appears that during the first period (1961 - 1971), producers' prices of all groups of products rose slower than consumers' prices, but faster than input prices. Thus, farmers who had consistently maintained the same level of efficiency could expect a higher net income, but prices of consumption goods rose simultaneously and the rise in net income was not completely reflected in increases in purchasing power 2).

In the period 1971 - 1980, livestock products maintained their parity *vis-a-vis* the total bundle of inputs, and the bundle of intermediate inputs as group. Although certain individual livestock products may not be in such a favourable position, *inter alia* because of slower price rises or relatively more fuel consumption, it does not appear, if judged according to macro data, that in general

TABLE 1 - Mean annual changes in certain characteristics of South African Agriculture over two periods

Item	Field crops		Horticulture		Livestock		Total	
	% Change	Stan. dev. *	% Change	Stan. dev. *	% Change	Stan. dev. *	% Change	Stan. dev. *
Gross value:								
1961 - 1971 **	+ 8,4	16,2	+ 8,0	6,7	+ 4,2	3,2	+ 6,1	6,6
1971 - 1980 **	+21,4	34,3	+14,8	7,6	+15,5	10,1	+16,4	14,0
Volume of production:								
1961 - 1971 **	+ 7,5	20,4	+ 6,2	4,3	+ 2,5	2,2	+ 4,5	7,4
1971 - 1980 **	+ 5,5	20,6	+ 3,6	3,9	+ 2,5	2,4	+ 3,0	7,1
Producers' prices:								
1961 - 1971 **	+ 2,2	2,1	+ 2,5	4,0	+ 2,9	3,0	+ 2,5	2,4
1971 - 1980 **	+13,6	6,7	+12,1	7,6	+15,3	13,1	+13,9	7,0

*Standard deviation based on n-1 degrees of freedom

**Last of years in Abstract used for this purpose eg. 1975/76 = 1976

TABLE 2 - Mean annual changes in prices paid for consumption goods and farm inputs in South Africa over two periods

Item	1961 - 1971		1971 - 1980	
	% Change	Standard deviation	% Change	Standard deviation
Consumption goods	+ 3,1	1,8	+ 11,2	2,5
Farm inputs:				
Combined	+ 1,9	1,5	+ 15,3	4,7
Machines	+ 2,9	1,5	+ 13,6	4,7
Fixed improvements	+ 2,2	1,5	+ 17,6	6,9
Intermediate inputs	+ 1,5	2,3	+ 15,6	5,8
Fertilizer	+ 1,4	3,3	+ 15,2	10,3
Fuel	+ 0,9	2,9	+ 27,1	26,5
Stock feeds	+ 2,4	2,3	+ 13,7	4,7
Pesticides	+ 1,2	1,5	+ 9,6	7,6
Packing material	+ 1,1	3,2	+ 10,9	5,5
Maintenance and repairs	+ 3,5	2,1	+ 13,0	3,6

TABLE 3 - Parity changes of agricultural product prices vis-a-vis consumption goods and input prices: 1961 - 1971 and 1971 - 1980

	Agriculture total		Field crops		Horticulture		Livestock	
	1971 1961	1980 1971	1971 1961	1980 1971	1971 1961	1980 1971	1971 1961	1980 1971
Consumption goods	0,94	1,24	0,92	1,21	0,94	1,08	0,98	1,38
<i>Input prices:</i>								
Total	1,06	0,90	1,03	0,88	1,06	0,78	1,10	1,00
Machines	0,96	1,02	0,93	1,00	0,96	0,89	1,00	1,14
Material fixed improvements	1,03	0,75	1,00	0,73	1,03	0,65	1,07	0,84
Intermediate inputs	1,10	0,88	1,07	0,85	1,10	0,76	1,15	0,98
Fertilizer	1,11	0,90	1,08	0,88	1,11	0,78	Irr	Irr
Fuel	1,17	0,37	1,14	0,36	1,17	0,32	1,21	0,42
Stock feeds	1,10	1,02	Irr	Irr	Irr	Irr	1,05	1,13
Pesticides	1,14	1,41	1,10	1,38	1,12	1,22	1,18	1,58
Packing material	1,14	1,27	1,11	1,24	1,15	1,10	1,19	1,42
Maintenance and repairs	0,91	1,07	0,88	1,05	0,91	0,93	0,94	1,19

Irr = Irrelevant

parities of animal products should lead to concern.

In contrast to this, the parities of field crops and horticultural products weakened compared to the total as well as all input groups with the exception of pesticides and packing material and

also in the case of field crops vis-a-vis maintenance and repairs as well as machinery. When compared to the total bundle of input prices, the parities of both field crops and horticultural products deteriorated substantially. Financial pressure on

field crop and horticultural producers has thus increased.

3. INTERNATIONAL COMPARISONS

In this analysis, changes in South African product and input prices as well as changes in product/input parities were compared to those in some other countries. The countries are those of which sufficient data appear in the 1980 FAO Production Year Book. The FAO classification of developed market economies (DME), less developed (or developing) market economies (LDME) and centrally planned states (CPS) was used for this purpose 3).

The 1980 yearbook includes price indices of different countries for different years. Countries, price indices of which included at least 1973 and 1978, were included in the analysis. The *modus operandi* was to equate the 1973 price indices to 100 and to adjust the latest available index (1978 or 1979 or 1980) accordingly. These indices were compared to the corresponding South African index (1973 = 100). If an index exceeded the South African index by 5 per cent or more, it was adjudged to be higher than the South African index. If on the other hand, it was exceeded by the South African index 5 per cent or more, it was adjudged to be lower. If it differed by less than 5 per cent from the South African index, these two were regarded as equal. The countries in the different groups were then counted.

Hereafter, parities of agricultural products were calculated in the same way as in the previous analyses, and compared to those of South Africa in the same manner. Results appear in Tables 4 to 8 4).

Producers' prices of agricultural products have undergone more rapid increases in South Africa than in the majority of developed market economies, which include major agricultural export countries such as Canada, the U.S.A., Sweden, Holland, Israel and Australia. In contrast, producers' prices rose faster in the less developed market economies. The more rapid rise in domestic prices could already on their own prejudice the competitive position of South African agriculture on its export markets. This has, however, been partially counteracted by a gradual weakening of the South African exchange rate *vis-a-vis* the currencies of Japan and the majority of the EEC countries (Reserve Bank, 1982) which together absorb a large portion of South Africa's agricultural exports.

With respect to combined indices of all inputs only 2 of the 11 developed market economies, and only 3 of the total of 17 countries in the analysis, have experienced more rapid price rises than South Africa. Compared to developed market economies, South African prices of particularly machinery, fertilizer, feed and fuel have risen rapidly. In contrast to this, price rises of pesticides in South Africa have been more or less in line with those in developed market economies. In the majority of

less developed countries, prices of machinery, pesticides and feed have risen faster than in South Africa, whilst prices of fertilizer and fuels rose slower than in South Africa. The centrally planned economies have consistently experienced slower rises in input prices than was the case in South Africa.

TABLE 4 - International comparison: latest index of producers' prices of agricultural products (1973 = 100)

Criterion	Crops	Livestock	Total
<i>Latest index < 5 % higher than S.A.</i>			
DME	3	3	4
LDME	4	3	3
CPS	0	0	1
Total	7	6	8
<i>Latest index within 5 % of S.A.</i>			
DME	0	0	1
LDME	1	1	0
CPS	0	0	0
Total	1	1	1
<i>Latest index < 5 % below S.A.</i>			
DME	9	7	6
LDME	2	1	1
CPS	2	2	2
Total	13	10	9
<i>All countries</i>			
DME	12	10	11
LDME	7	5	4
CPS	2	2	3
Total	21	17	18

DME = Developed market economies

LDME = Less developed market economies

CPS = Centrally planned states

These findings show that the so-called "imported" inflation so often mentioned by newspapermen, politicians and even economists, does not have validity in this sense. Such rapid rises in prices of inputs in South Africa relative to price increases in other developed economies, can result from a number of possible causes: Deteriorations in the exchange rate of the rand (which has in fact occurred), inefficiencies in domestic distribution, monopolies in South Africa and import tariffs.

The role of tariff protection was analysed by Le Clus (1982). He showed protection of a wide spectrum agricultural inputs to cause prices in South Africa to be between 35 per cent and 74 per cent higher than would be the case had the same products been freely imported without taxes. These inputs include certain pesticides, fertilizers, bags, tyres, tractors and spare parts. The extent to which import tariffs and excise duty influence fuel prices is unknown.

Neither are monopolies an unknown phenomenon in the South African input supply industries. The Competition Board (1979) has, for example, found a harmful cartel to exist in the fertilizer industry. In addition some state controlled corporations and institutions are effectively in

TABLE 5 - International comparison: latest price indices of farm inputs (1973 = 100)

Criterion	All items	Machinery	Fertilizer	Pesticides	Feed	Fuel
<i>Latest index < 5% higher than S.A.</i>						
DME	2	2	2	3	1	2
LDME	1	4	3	3	3	1
CPS	0	0	0	0	0	0
Total	3	6	5	6	4	3
<i>Latest index within 5% of S.A.</i>						
DME	1	2	1	1	0	0
LDME	0	0	0	0	0	0
CPS	0	0	0	0	0	0
Total	1	2	1	1	0	0
<i>Latest index < 5% below S.A.</i>						
DME	8	5	8	4	10	8
LDME	2	2	5	1	1	2
CPS	3	2	3	2	3	1
Total	13	9	16	7	14	11
<i>All countries</i>						
DME	11	9	11	8	11	10
LDME	3	6	8	4	4	3
CPS	3	2	3	2	3	1
Total	17	17	22	14	18	14

TABLE 6 - International comparison: latest parities for combined agricultural producers' prices (1973 = 100)

Criterion	Combined agricultural producers' prices compared to:					
	All inputs	Machines	Fertilizer	Pesticides	Feed	Fuel
<i>Latest index < 5% higher than S.A.</i>						
DME	8	4	5	0	11	7
LDME	4	5	5	1	3	2
CPS	3	2	3	1	3	1
Total	15	11	13	2	17	10
<i>Latest index within 5% of S.A.</i>						
DME	1	1	1	2	0	0
LDME	0	0	0	1	0	0
CPS	0	0	0	0	0	0
Total	1	1	1	3	0	0
<i>Latest index < 5% below S.A.</i>						
DME	1	4	3	4	0	1
LDME	0	0	0	1	0	0
CPS	0	0	0	2	0	0
Total	1	4	3	7	0	1
<i>All countries</i>						
DME	10	9	9	6	11	8
LDME	4	5	5	3	3	2
CPS	3	2	3	3	3	1
Total	17	16	17	12	17	11

legally protected monopoly positions.

The effect of such occurrences is a deterioration of the competitive position of export industries of international markets, particularly international markets which are as highly competitive as those on which South African agriculture has to compete. This danger and the causal role of import tariffs have been pointed at previously (Groenewald, 1979(a); Groenewald, 1979(b); Groenewald, 1980).

The combined effect of product and input price changes is ultimately reflected in the parity of product prices. In this respect, the international comparisons are of interest. Although many

countries in the world experience deteriorating parities with respect to combined producers' price indices relative to all inputs, 8 out of 10 developed market economies have fared better than South Africa (Table 6) 5).

All four less developed market economies and all three centrally planned economies have also fared better. In respect of machinery, South Africa still found herself in a median position in 1980, 6) and with respect to fertilizers, close to a median position for developed market economies. South Africa's parity was better than average with respect to pesticides and very weak with regard to feed and fuel.

TABLE 7 - International comparison: latest parities for crop prices (1973 = 100)

	Crop prices compared to:				
	All inputs	Machines	Fertilizer	Pesticides	Fuel
<i>Latest index < 5 % higher than S.A.</i>					
DME	5	1	4	1	7
LDME	4	3	6	1	2
CPS	2	1	2	0	1
Total	11	5	12	2	10
<i>Latest index within 5 % of S.A.</i>					
DME	2	1	1	1	0
LDME	0	1	0	1	0
CPS	0	0	0	0	0
Total	2	2	1	2	0
<i>Latest index < 5 % below S.A.</i>					
DME	3	7	6	6	3
LDME	0	1	1	2	1
CPS	0	0	0	1	0
Total	3	8	7	9	4
<i>All countries</i>					
DME	10	9	11	8	10
LDME	4	5	7	4	3
CPS	2	1	2	1	1
Total	16	15	20	13	14

TABLE 8 - International comparison: latest parities for livestock products (1973 = 100)

Criterion	Livestock products prices compared to:		
	All inputs	Feed	Fuel
<i>Latest index < 5 % higher than S.A.</i>			
DME	8	10	9
LDME	4	3	3
CPS	2	2	1
Total	14	15	13
<i>Latest index within 5 % of S.A.</i>			
DME	1	0	0
LDME	0	0	0
CPS	0	0	0
Total	1	0	0
<i>Latest index < 5 % below S.A.</i>			
DME	0	0	0
LDME	0	0	0
CPS	0	0	0
Total	0	0	0
<i>All countries</i>			
DME	9	10	9
LDME	4	3	3
CPS	2	2	1
Total	15	15	13

Turning to Table 7 (parities for crops) it is evident that of the 10 developed market economies in the analyses, the parity of 5 regarding all inputs was better than that of South Africa and the parity of 2 worse. All the less developed market economies and centrally planned countries showed better parities in this respect than South Africa. With respect to machinery, fertilizers and pesticides South Africa experienced a better than average parity at the end of the period, but also a very weak one regarding fuel.

Concerning livestock products, there was only one country (Australia) which did not have a parity *vis-a-vis* all inputs exceeding that of South Africa. The parity of livestock products compared to feed and fuel was higher in every included country than in South Africa (Table 8).

4. INCOME IMPLICATIONS

The trends outlined above involve a number of potentially important implications for South African agriculture.

The more rapid rise in input than in product prices obviously puts serious pressure on incomes of producers and their purchasing power. Tomlinson (1979) shows that the average gross margin per ton of maize increased from R10,06 in 1963/64 to R20,50 in 1978/79, thus an increase of 103,8 per cent. Due to increases in prices of consumption goods, the real value, i.e. the purchasing power of the gross margin at a constant money value, declined by 24,4 per cent from R10,06 to R7,61 over the same period. Le Clus (1982) argues that for the maize industry as a whole, total cost increases outstripped the growth in production value to such an extent that profit, in total terms, declined for the industry. In another analysis, the position of a hypothetical farmer who initially obtained a net income of R51,00 out of a gross income of R100,00 was used as starting point. If in this case, prices and quantities rise at the prevailing rate for the period 1971/72 to 1978/79 the net income increases for 7 years and declines thereafter. If debt obligations increase at the average rate for that period, the amount available for consumption rises for 5 years and declines thereafter until it becomes negative in the 12th year. The farmer's purchasing power with respect to

consumption goods declines all the time at an accelerating rate (Groenewald, 1980).

Louw (1981) shows that the difference in rates of increase, as well as the original margin of revenue above costs rate amongst the most determining factors regarding how long it will take before an income becomes negative. With an original margin of only 20 per cent and a 7,5 per cent excess (faster increase in input prices), it will take only four years. With an original margin of 40 per cent and an excess of 2,5 per cent, it will take 22 years.

There seems to be only a slight probability for productivity increases to be sufficient to absorb the decline in profitability. In addition, productivity increases, if these are reflected in higher total production, will result in downward pressure on producers' prices w.r.t. products marketed domestically. If the relative inelastic price elasticity of demand for agricultural products is taken into account, the futility of production increases without cost savings (in any case, per unit of product) becomes clear.

In addition, South African agriculture and in particular certain agricultural industries (maize, citrus, deciduous fruit, dried fruit, wool, mohair, karakul pelts, sugar, canned fruit, etc.) is for its earnings largely dependent on exports to highly competitive (and sometimes discriminating) world markets.

Even if state action could succeed in causing drastic increases in domestic prices, it would in most cases be unwise for the State to move far in that direction. The State has goals and responsibilities in other spheres which cause low food prices to appear to be an attractive alternative to the policy maker.

It also appears that the rapid rise in input prices in South Africa relative to those in most other countries, will, if these trends are continued, almost inevitably weaken the competitive position of the South African exporter to such an extent that his continued operation on the export market can be terminated.

A rapid lowering in the purchasing power of the farming population will if it continues for long, hasten the process in which larger farmers and companies buy land from small and medium sized farmers and thereby increase concentration in farming and also accelerate the exodus of White farmers out of agriculture. Such an exodus can be expected to change the existing White-Nonwhite population ratio in rural areas radically.

5. POLICY IMPLICATIONS

It has been argued above that the exchange rate of agricultural products, if it continues as at present, will result in financial deterioration in farming and possibly an accelerated exodus of farmers.

The chances to handle the problems by means of product price increases are rather slight.

Therefore, the emphasis will increasingly have to be on cost savings. In the light of the important role of import tariffs and/or monopolies with regard to prices of certain inputs, it appears that some of the most pressing economic problems of the agricultural sector cannot be solved through agricultural policy *per se*. General economic policy therefore becomes increasingly important with agricultural policy as essential component thereof. Agriculture is, in addition, closely affected by occurrences at monetary level. This is illustrated by increases in the interest burden of agriculture from approximately R200 million to approximately R800 million in 1981 (Willemse, 1982). Agriculture is furthermore greatly influenced by administered prices of state corporations.

The solution will have to be sought in more effective competition within the South African economy. This may involve a gradual removal of those import tariffs that cannot be defended on grounds of dumping or of indisputable strategic importance. Even in the latter case, a re-evaluation of methods of protection will be appropriate. If the principle hold that "cost should be brought home where those costs belong", then it will probably rather mean that the taxpayer will have to pay for public strategic goods through subsidies than by placing the burden on other sectors such as agriculture, mining and certain secondary industries.

Thus, it is also in the interest of agriculture to have a certain degree of liberalisation in the economy. This does not mean a return to the *laissez faire* system of the nineteen twenties; times have changed too much, and that system was not a match for the problems of its own era. Neither does it mean that structures (for example under the Marketing Act) which have yielded to farmers more bargaining power, should be abolished. It does however mean that there should be more movement toward a natural economic order, rather than a "hothouse" economy.

In a recent speech the chancellor of the German Federal Republic pointed at the importance of a strong economy for the survival of the western world. He stated thus: "I have already warned against the seemingly obvious method of guarding one's own economy by protectionist measures. The adoption of such a method would lead to the destruction of the western economic system. There should therefore be no trade protectionism, neither in steel, nor in agricultural products, neither in cars, nor in electronics equipment." (Schmidt, 1982).

Whether the EEC can be persuaded to abolish protectionism, also in agriculture, is an open question. Whether all protection can be dispensed with realistically is another 7).

It does however appear that more voices have world wide been protesting lately against policies of exclusive trade protection, and that there is a growing consciousness that the economic salvation of the western world is not embedded in such policies.

Also South Africa's Prime Minister has been quoted as follows: "We shall continue to move away from direct economic control of a socialistic nature, such as price and wage control, import control, exchange control and bank credit ceiling" (Botha 1981).

The solvation of also agriculture in South Africa partially depends on the execution of such policy intentions.

FOOTNOTES

1. An alternative method can be to apply time regression on the variables to calculate rates of change on this basis, and to calculate variations about the regression lines. The method as described in the text was chosen since degrees of freedom could create problems in the regression approach.
2. It must be borne in mind that calculations of the consumers' price index are based on urban patterns of expenditure and can thus, strictly speaking, not be regarded as a good criterion of changes in costs of living of farm families.
3. The countries included in the analyses, were divided as follows:
Developed market economies (DME): Canada, U.S.A., Finland, Sweden, United Kingdom, Japan, Denmark, Spain, Israel, Holland, Portugal, Australia.
Less developed market economies (LDME): Hong Kong, Republic of Korea, Mauritius, Mexico, Burma, Turkey, Colombia, Cyprus.
Centrally planned states (CPS): Czecho Slovakia, Hungary, Poland.
4. As not the same statistics have been published for all countries, total numbers of countries will vary among different analyses.
5. The deterioration in the USA was somewhat faster than in South Africa, but was within the 5 % limit. Australia's parity deteriorated more rapidly.
6. By 1980 the Atlantis Diesel Engine Project was still far from completion.
7. The Schmidt Government has since fallen.

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