Final Report
Strictly Confidential

Pricing behaviour in the South African food and agricultural sector

A report to the National Treasury

Nick Vink
Johann Kirsten

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- South African Grain Information Service (SAGIS)
- South African Meat Industry Company (SAMIC)

A glaring omission in our data was however the detail statistics on costs, volumes and prices at retail level. These statistics are generally treated as confidential and difficult to obtain without the collaboration of the major retail chains. This was not forthcoming despite several requests.

We also tested our findings with key stakeholders in the industry and with individuals knowledgeable about the working of our agricultural and food markets.

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Johann Kirsten, University of Pretoria
Nick Vink, University of Stellenbosch
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EXECUTIVE SUMMARY

Retail prices of staple foods in South Africa have increased rapidly in the past few months, to the extent that they may have adversely affected the state's ability to reach its inflation targets. These increases have caused concerns for the plight of the rural and urban poor in the country, for sound macroeconomic management, and for those concerned with the possibility of market manipulation and even corruption in the price setting process.

In this regard, the purpose of this report was to explain the price setting process for food products at different levels of the supply chain, from the farm gate to the retailer, and to attempt to explain the most important influences. Given the urgency of the project, it was not possible to provide a formal 'proof' of competing hypotheses about the nature of the price mechanisms in the food chain. Instead, a descriptive analysis is provided of the most important events of the past months in order to arrive at a clearer understanding of the forces driving food price increased. This explanation is provided against the background of the most important features of the agricultural and food sector and of the policy decisions that have guided this process.

Commercial and small-scale farmers in South Africa receive less support from the state than their counterparts in every industrial country in the world with the exception of New Zealand. This is the consequence of a process of deregulation that started two decades ago, and became faster, broader and deeper after 1994. The result, in efficiency terms, has been encouraging. Output from commercial agriculture has continued to grow; export growth has exploded, especially in the horticultural sector; farmers have increased productivity; and the sector has become more sustainable in environmental terms.

In equity terms, however, the record is less positive. The policy changes that drove the process of deregulation and liberalisation have created 'winners' and 'losers' among commercial farmers, who had no safety net to protect them from a rapidly changing environment. Historically disadvantaged commercial, emerging and small farmers have also yet to benefit from their involvement in the sector. The state has not succeeded in providing access to resources (land, water, technology, credit) or to input and produce markets for these participants on a meaningful scale.

Within this environment, described in Chapter 1, market forces of supply and demand determine the prices that farmers receive for their produce, and that processors, distributors and traders pay for those products. In Chapter 2 we explain that when a product is exported, the seller (a farmer, a marketer, etc.) receives the price, net of the costs of getting the physical product to the foreign country, that the foreign buyer is prepared to pay. The seller is paid in the currency of the buyer, and hence gains from the depreciation in the value of the South African Rand. When a product is sold in the domestic market, however, the level of the price depends on whether that product can be imported or not.

Generally, when food products, such as most fresh vegetables, are highly perishable, they are not traded internationally on a big scale. Hence, vegetable prices in South Africa are determined by supply and demand conditions in this country. However, in the case of a product such as maize, millers who are the biggest buyer of the maize crop, have the option of importing maize rather than buying local maize. In a deregulated market, they will always buy from domestic and foreign sources for a wide range of reasons. However, the source of the bulk of their purchases will depend mostly on price. When they import the product, the exchange rate has an inordinately important influence on the actual price they pay.

A depreciation in the value of the South African rand will make it more expensive to import products such as maize, wheat and oilseeds, hence providing some protection to South African

farmers, and an incentive to produce more in the longer term. Yet if South African, or Southern African producers are unable to supply the full needs of the processors, or if processors are uncertain about South African supplies, they will again look to foreign sources. South African suppliers, on the other hand, will look to the export market in the event that domestic processors are unwilling to pay them the prevailing market price. In this manner, the market sets a 'natural' floor and ceiling price, i.e. a price band, within which such products trade. The mechanism by which these prices are set is the Agricultural Markets Division of SAFEX.

There are two conditions that affect this price band in the case of South African maize. First, the world price of white maize is largely determined by conditions in the South African market, as Southern Africa is the largest point of production and consumption for white maize in the world. For technical reasons that are explained in the report, an increase in the South African price reinforces the world price that is transmitted back into the South African price when the exchange rate weakens. This aspect requires urgent attention, as is pointed out by participants in the market.

Second, the resulting price is not transmitted automatically into the retail price of the product. The historical evidence is that when farm gate prices increase, retail prices increase almost immediately. When farm gate prices decrease, however, retail prices often continue to increase, at least in nominal if not in real terms, and seldom decrease along with farm gate prices. The reason probably lies in the lack of competitiveness in the supply chain beyond the farm gate.

We come to the conclusion, at the end of Chapter 2, that **the recent increase in the farm gate price of basic food commodities has come about as a result of a unique combination of five factors**. These are (a) an increasing world price for these commodities, (b) a lack of competition in the supply chain beyond the farm gate, especially at the retail level, (c) a fast and severe depreciation in the value of the currency, (d) a shortage of maize in the SADC region, and (e) a climate of uncertainty, created specifically by the unfortunate circumstances surrounding the land reform programme and the elections in Zimbabwe, and more generally by the instability in parts of Central and Southern Africa.

Chapter 3 addresses the question of remedial action in broad terms: what can or should be done about food price inflation in South Africa? First, the actual measurement of the CPI is investigated. The main conclusion here is that the authorities have put considerable effort into ensuring that the measurement of food inflation is conducted according to international best practices, yet given the South African realities. While suggestions are made for further improving this measure, there is no evidence that the Food CPI in South Africa systematically over- or understates the actual rate of food price inflation.

The first part of Chapter 4 then addresses the South African, the Southern African and the developing country experience with food subsidies. The lessons from the research on the policy options open to decision makers in the face of increased food prices that has been reviewed here can be summarised as follows:

- There is some justification for targeted food subsidy programmes, and the evidence is that they can succeed in addressing the needs of the poorest. However, these programmes are expensive, and the poor generally get less than half of the benefit, the rest being capture by wealthier people. In addition, food subsidy programmes were introduced in many developing countries in an attempt to compensate for policy deficiencies in other areas of the economy.

- The experience in Southern Africa shows that the market can generate unexpected solutions and successes that make the market work more efficiently. However, the market does not always respond spontaneously, and concerted effort is required by the private sector and by

the public sector to lower transactions costs, promote regional trade, and provide market information systems. Further, the private sector's response to liberalization is sensitive to a broader range of government actions than commonly understood.

- The evidence generally is that the 'losers' from deregulation and liberalisation are mainly low-income earners in urban and semi-urban areas, smallholder farmers in remote areas and unskilled farm workers. Policies should be put in place to address production constraints, barriers to market access and non-economic barriers to broad-based economic growth.

In the review a wide range of subsidy instruments commonly used for the explicit purpose of controlling the prices that poor people pay for specific food items, and often to control the rate of inflation of food prices, were identified. Yet there are three important aspects of the context within which these subsidies were implemented:

- There was a strong belief during the 1970s that staple food prices were increasing, and would continue to increase. Measures to protect the poor from the impact of these price increases were, therefore, justified on political and humanitarian grounds. Later, an economic argument was added, namely that subsidies targeted at the poorest would be beneficial for growth. However, commodity prices generally, and the prices of staple foods in particular have declined in real terms over the ensuing decades. The recent transmission of higher food prices into the South African market is a special case.

- There was consensus among analysts and policy makers that the most effective way to increase food production in developing countries was to provide farmers with incentives through higher prices, and with improved technology to lower production costs, and hence to increase their profit margins. However, while such policies would benefit farmers, the landless rural poor and the urban poor would face higher food prices. Interventions in the market to protect these groups were, therefore, justified. Later experience has, however, shown that these groups are only penalised to the extent that higher farm gate prices are transmitted into higher consumer prices.

- The 1970s were characterized by a global fixed exchange rate regime. Higher world prices for staple foods were translated directly into high domestic prices in developing countries that did not have farm price support programmes such as those followed by the industrialised countries.

The analysis in Chapter 2 shows, however, that the South African circumstances differ from this context. **First,** the evidence is that the world price of maize and many other basic commodities has increased in the past few months, and is expected to continue increasing. The analysis has also shown that in a liberalized market, these higher international prices are transferred into the domestic market almost immediately. Thus, there may be some justification for intervention by the authorities. **Second,** however, the lack of competition further down the supply chain has had a bigger effect on the prices that poor people pay for their basic needs than has the supply of farm commodities. **Third,** we live in a world characterised by market-determined exchange rates, and the exchange rate has had a bigger and more immediate impact on the South African domestic price of maize than has the world price.

It is these differences that form the background to the specific recommendations made in the second part of Chapter 4.

Efficient markets: SAFEX

Under 'normal' circumstances, the combination of increasing world food prices, a poor domestic crop and a collapse in the exchange rate is a rarity. In the case of white maize specifically, however, there is a connection between these factors, specifically because Southern Africa is the only region in the world where large quantities of superior quality (white) maize is grown for human consumption[1]. In an efficiently functioning market, the rapid increase in the South African price for maize would result in one of two market reactions, given that the South African price influences the world price of white maize. **First,** imports of high quality white maize should increase. As this is not available elsewhere, imports of lower quality white maize should increase. However, this is not possible at present, for technical reasons. **Second,** in the longer term, i.e. if the shortage of white maize in Southern Africa persists, the increased domestic price, transmitted to the rest of the world, should encourage producers in other parts of the world to grow white maize specifically for the South African market. Again, this is not possible at present. However, it appears that a market solution to this problem does exist.

Recommendation 1

For this reason, we recommend that the authorities, in collaboration with the Agricultural Markets Division of SAFEX, should investigate the desirability of introducing a maize futures contract that makes provision for "non African Origin". The desirability of restricting this to farmers in the USA, and of allowing lower quality maize should be included as part of this investigation.

Efficient markets: further down the chain

The poor in South Africa have been adversely affected over the past few months by higher retail food prices, and that the trends in these prices are largely divorced from prices at the farm gate, especially in the case of maize and wheat. Intervention by the state in primary agriculture in South Africa during the 1930s was initiated because of the (perceived) lack of bargaining power of farmers. Deregulation was introduced largely because the farmer support system had become too expensive, and because the benefits were skewly distributed. This does not, however, mean that farmers have automatically gained sufficient bargaining power, as has been proven over the past few months. There is, in fact, an argument that the control mechanisms that were put in place in the 1930s initially improved the bargaining power of farmers through the system of co-operatives and marketing boards but later led to increased bargaining power of processors, distributors and traders which was the result of practices such as restrictive licensing.

Recommendation 2

For this reason, we recommend that the relevant authorities initiate full investigations into the degree of competitiveness in the supply chain for the strategically important commodities that constitute the basic food needs of the poor in South Africa, under the auspices of the Competition Act. Such investigations should include an identification of the barriers to access to markets, including inadequate infrastructure, inappropriate pricing strategies for modes of transport, a lack of communications facilities, etc.

[1] White maize is grown in Mexico for the manufacturing of *tortilla*, but this does not change the main argument.

Efficient markets: the farm level

There is little evidence that small farmers have benefited from the new trading environment in agriculture, while there is strong evidence that the efficiency and the fairness of the agricultural sector would be enhanced by a successful land reform and small farmer support programme. As a result, most small farmers in South Africa are still poor, are net food buyers, and are as adversely affected by higher consumer prices for food, as are the landless rural and urban poor.

Recommendation 3

For this reason, we recommend that greater consideration be given to successful land reform and farmer support programmes that result in the creation of successful livelihoods for the millions of current (and potential) farmers from disadvantaged communities who deserve these opportunities. While the plight of the rural poor in South Africa is better now than a decade ago, the agricultural sector has not been allowed to play the important role that it should in the fight against rural poverty. Government needs to reverse the decay in agricultural infrastructure, and refocus efforts in support of poor and disadvantaged farmers.

Alleviating the plight of the poor

It is clear that poor people living in the rural, the urban and the peri-urban areas of South Africa have been most affected by the increase in the farm gate prices of staple foods. Our analysis shows that the consumer prices of these products will not decline in nominal terms in the short to medium term despite the strengthening of the rand in recent months. Hence, there is an argument for measures to alleviate the plight of the poor.

While we understand the need for remedial action, however, it is clear that South Africa already has mechanisms in place to combat poverty. These include the Public Works Programme, the Primary School Nutrition Programme, and the proposed Comprehensive System of Social Security. Further, experience has shown that specific food subsidies have unintended consequences and, like all subsidy programmes, are difficult to terminate once initiated.

Recommendation 4

For this reason, we recommend that the Government take an in-principle decision not to meet short-term emergencies such as the current rise in consumer prices for basic foods with short-term reactions. The solution rather lies in sound risk management strategies, and properly implemented poverty alleviation policies.

Calculating the CPI

The analysis has shown that considerable effort has been expended in ensuring that the calculation of the CPIF accords with recognised international practices. However, it is clear that the current practice could lead to a misrepresentation of the actual rate of food inflation. It is not clear whether the current practice over- or understates the real rate of inflation in the prices of food products.

Recommendation 5
For this reason, we recommend that StatsSA should give serious consideration to finding a more satisfactory definition of rural areas; that provision should be made for the inclusion in the CPI calculations for the sale of food products through informal sector outlets in urban and rural areas; and that consideration should be given to including the price trends for food consumption away from the home.

Purpose of the study (Terms of Reference)

The purpose of this report is to identify and analyse the factors that have had the greatest influence on the rate of inflation in food prices in South Africa in recent times, and to make recommendations for remedial steps to support inflation targeting. In this respect, the Terms of Reference of the investigation are to provide:

- **A descriptive analysis of the food and agricultural sector.** The purpose will be to familiarise readers with conditions in the South African food and agricultural sectors by focussing on the policy environment, the main trends in output, productivity, profitability and foreign trade in the sector, the degree to which the state intervenes in different parts of the many supply chains that constitute the food and agricultural sector, the factors shaping the future of the food and agribusiness sectors, and the influence of the regional (SADC) market on South African agricultural markets and prices

- **An analysis of price trends in the food and agricultural sectors.** The purpose will be to investigate the price-setting mechanisms in the various food supply chains in South Africa. This will include an analysis of trends in farm gate prices, as well as in prices at different levels in the value chain, and trends in the producer share of the consumer rand. Specific attention will also be paid to the causes of the recent hike in producer and retail prices of key food commodities. Technical aspects of the measurement of the food price CPI will be investigated, as well as the impact of recent food prices increases on government's inflation targets.

- **An analysis of pricing behaviour in the food and agricultural sector.** The information gathered will be used as a basis for the selection of the most important supply chains to be subjected to more detailed analysis of institutional aspects, as well as the role of subsidies and tariffs in these specific subsectors.

- **Recommendations for future action.** This section will pay specific attention to recommendations with regard to interventions that could ameliorate the effect of high food prices, and ways of addressing market failures in the market for agricultural and food products.

In this respect the report starts with a descriptive analysis of the policy environment within which the agricultural sector operates. This is followed in Section 2 by an empirical analysis of the trends in prices at the different levels of the value chain in agriculture. The current practice in measuring the food CPI in South Africa and a selected group of other countries is presented in Section 3, while the analysis of pricing behaviour is presented in Section 4, starting with an assessment of international 'best practices'. The report ends with some recommendations

CHAPTER 1

THE FOOD AND AGRICULTURAL SECTOR

The purpose of this section will be to familiarise readers with conditions in the South African agricultural and food sectors. Particular aspects that will be covered will include:

- The policy environment. The focus will be on the large changes that have been made to agricultural policy in the past two decades, and will include a description of the main elements of the current and prospective policy regime facing the sector. This will include a brief review of trade and macro-economic policies that also had a profound impact on the agricultural sector
- The main trends in output, productivity, profitability and foreign trade in the sector
- The degree to which the state intervenes in different parts of the many supply chains that constitute the food and agricultural sector.
- The most important factors shaping the future of the food and agribusiness sectors.
- Understanding the influence of the regional (SADC) market on South African agricultural markets and prices

1.1 Agricultural and food policy

Marketing policy[1]

Until early in 1998 the marketing of most agricultural products in South Africa was extensively regulated by statute. Most products were regulated under the 22 marketing schemes introduced from 1931 and especially from the time of the 1937 Marketing Act (consolidated in the Marketing Act of 1968), although some products, including sugar, wine and ostriches, were regulated by those industry's own institutions under separate legislation. These arrangements are summarised in Appendix 1.

Beginning two decades ago, the industry faced increasing pressures for deregulation, a process that was accomplished in two phases over this period. The major change in the first phase was the extensive deregulation of state agricultural marketing schemes within the framework of the Marketing Act of 1968. The steps taken have been extensively recorded by the National Agricultural Marketing Council (NAMC). The origins of this change can be found in the shift in monetary policy in the late 1970s and fiscal strategies in the 1980s, which undermined the complex structure of protection, price support and cross-subsidies on which agricultural support was founded. Yet isolation from the world market, accompanied by the increased isolation of the country in social, cultural, political and intellectual spheres during the 1980s, meant that the deregulation steps that did take place were aimed at the domestic market. Foreign trade still largely consisted of managing imports and exports in order to manipulate domestic prices (e.g. maize, wheat), or of monopoly export schemes (e.g. for fruit). The first real steps in opening the agricultural sector to world market influences came with the Marrakech Agreement of the GATT in 1993, when all direct controls over agricultural imports were replaced by tariffs.

The most sweeping change was, however, brought about by the Marketing of Agricultural Products Act, No 47 of 1996. This new Act represented a radical departure from the marketing regime to which farmers had become accustomed in the period since the 1930s. While far reaching, the deregulation that had taken place since the 1980s was piecemeal, uncoordinated, and accomplished within the framework of the old Marketing Act, with the result that any policy changes could easily be reversed. The new Act changed the way in which agricultural marketing policy would henceforth be managed in South Africa, not least by opening the sector to world market influences in a manner that could hardly have been anticipated a decade earlier. The Marketing of Agricultural Products Act, No 47 of 1996 set up the NAMC, whose immediate task was to dismantle the existing Control Boards, and subsequently to manage and monitor state intervention in the sector. The current state of affairs is summarised in Appendix 2.

Other policy reforms impacting on agriculture

[1] For a more detailed discussion see e.g. Kirsten and Van Zyl, 1996; Vink and Kassier, 1991; Vink, 1993; 2000a & 2000b. See also the Kassier committee report (1992) and AMPEC/Basson committee (1994) on the details of the deregulation proposals

The most important of the other policy initiatives in- and outside of agriculture since 1994 include:

- **Land reform,** consisting of the land restitution, land redistribution and tenure reform programmes. This initiative, launched in 1994, was aimed at settling small farmers on viable farming operations in the commercial farming areas. Recent reviews of the programme show that the pace of reform has been slow, and have resulted in a reorientation of the programme away from a strict focus on poverty alleviation. Nevertheless, progress remains slow.

- **Institutional restructuring in the public sector.** This included the 'provincialisation' of the Department of Agriculture, a change in the relationship between the Department and farmer lobby groups, the reorientation of the mission of the Agricultural Research Council, (established in 1993), and the restructuring of important statutory bodies with a development mandate in the rural areas generally such as the Development Bank of Southern Africa and the Land Bank.

- **Labour market reform.** While labour legislation governing working conditions, wage rates, etc. has progressively become applicable to the agricultural sector and the Sector Determination of 2001 will have far-reaching effects, certain aspects of the land reform programme have also impacted on agricultural labour, including the introduction of legislation that governs the occupational rights of workers who live on farms.

- **Infrastructure programmes in the rural areas** that are aimed at the provision of social services (welfare benefits, and health and education services) and physical infrastructure, including water, energy and transport and telecommunications services. These have been accompanied by a transformation of the system of local government in the country, and steps to focus the attentions of local authorities more on development issues.

- **Trade policy reform.** This aspect is discussed in more detail below.

The general purpose of these reforms was to correct the injustices of past policy, principally through land reform, to get the agricultural sector on a less capital-intensive growth path, and to enhance the international competitiveness of the sector.

Trade policy[2]

Quantitative restrictions, a multitude of tariff lines, a wide dispersion of tariffs, and formula, specific and ad valorem duties and surcharges, characterized South Africa's trade regime before 1994. In agriculture, quantitative restrictions, specific duties, and price controls, import and export permits and other regulations were found. This changed after South Africa became a signatory to the Marrakech Agreement. Initial progress in rationalizing the tariff regime and with lowering nominal and effective protection was fast (see Table 1). Between 1990 and 1999, the number of tariff lines was reduced from 12 500 in 200 tariff bands to 7 743 in 47 tariff bands or fewer than 2500 in 45 bands if the zero tariffs are ignored. The maximum existing tariff was also reduced from almost 1400% to 55% and the average economy-wide tariff fell from 28 to 7.1%.

The structure of protection also affects agriculture. The data in Table 2 show that the average tariff cascades from a relatively high rate on consumer goods to moderate on intermediate goods and low on capital goods. This pattern, which is typical of protection in many developing countries, implies that less progress has been made in rationalizing *effective* protection.

Table 1: Deregulation of the South African tariff structure

	All rates 1990	**All rates 1996**	**All rates 1999**	**Positive rates 1999**[1]
Number of lines	12500	8250	7743	2463
Number of bands	200	49	47	45
Minimum rate (%)	0	0	0	1
Maximum rate (%)	1389	61	55	55
Unweighted mean rate (%)	27.5	9.5	7.1	16.5
Standard deviation (%)	n.a.	n.a.	10.0	8.6
Coefficient of variation (%)	159.8	134.0	140.3	52.2

Note: [1] Rates >0
Source: Lewis, 2001

[2] This section draws heavily on Lewis (2001)

Table 2: The structure of tariffs in South Africa

	Trade-weighted average	Unweighted average	Maximum rate
Mining	0.1	1.4	15
Agriculture	1.8	4.6	35
Manufacturing	4.4	7.5	55
Food, beverages & tobacco	4.2	11.8	55
Textiles, apparel & leather	10.4	18.4	50
Wood & wood products	8.1	10.3	30
Paper & paper products	7.0	7.3	22
Chemicals	4.2	5.5	40
Non-metallic minerals	6.6	7.4	30
Basic metals	4.1	4.5	15
Metal products and equipment	3.8	5.1	54
Other manufacturing	4.7	8.3	30
All sectors	3.9	7.3	55

Source: Lewis, 2001

The export growth performance of the South African economy has strengthened further since 1999, although there are evident concerns about the effect of the slow-down in economic growth that is expected among the G-8 countries from 2001 on. Schüssler (2001), for example, shows that South Africa's exports grew by 7% per annum in US$ terms (and 25% in rand terms) during the 12-month period October 2000 to September 2001[3]. This achievement has also resulted in a restructuring of the country's export portfolio. Exports of motor vehicles, for example, increased by 36% in rand terms during this period, while exports of processed food and beverages grew by 47%. Overall, exports of manufactured goods grew by 11% in US$ terms. During this period imports grew by only 17% in rand terms, which suggests that the growth rate in US$ has been negative. As a result, the surplus on the trade balance has doubled from last year, while the country recorded a surplus on the services balance for the first time in 39 years.

Trade in Southern Africa

The three most important trade relations in the Southern African region include SACU, which exhibits the deepest level of integration, SADC and the South Africa-Zimbabwe bilateral agreement. Of the extra-regional influences, the Lomé (and now Cotonou) preferences, the Africa Growth and Opportunity Act (AGOA) of the USA, and South Africa's separate bilateral Agreement with the EU are most influential.

The fourteen member countries of SADC represent a total population of approximately 200 million people (World Bank, 2001). Three countries (the DRC, South Africa and Tanzania) account for almost two thirds of the total. Total SADC Gross Domestic Product (GDP) was around US$182bn in 2000, while average GDP *per capita* was US$1761. However, there are wide variances. Seven SADC countries are classified as least-developed economies (Angola, the DRC, Lesotho, Malawi, Mozambique, Tanzania and Zambia).

Most SADC countries are still reliant on agricultural and mineral raw materials. Industrial output in the region is heavily concentrated in resource-intensive activities such as food, beverages, tobacco and textiles, which account for half the regional manufacturing value-added. Manufactures make up more than 70% of total imports, but only 10% of exports. Total imports from the rest of the world into SADC amounted to $32 052.4 in the late 1990s, of which South Africa accounted for two thirds. Non-SACU intra-SADC trade amounts to only 0.9% of total imports.

1.2 The effects of deregulation

The effects of these changes in policy can be measured in terms of the main trends in outputs, input use, productivity, profitability and foreign trade in the sector.

Outputs, inputs and productivity

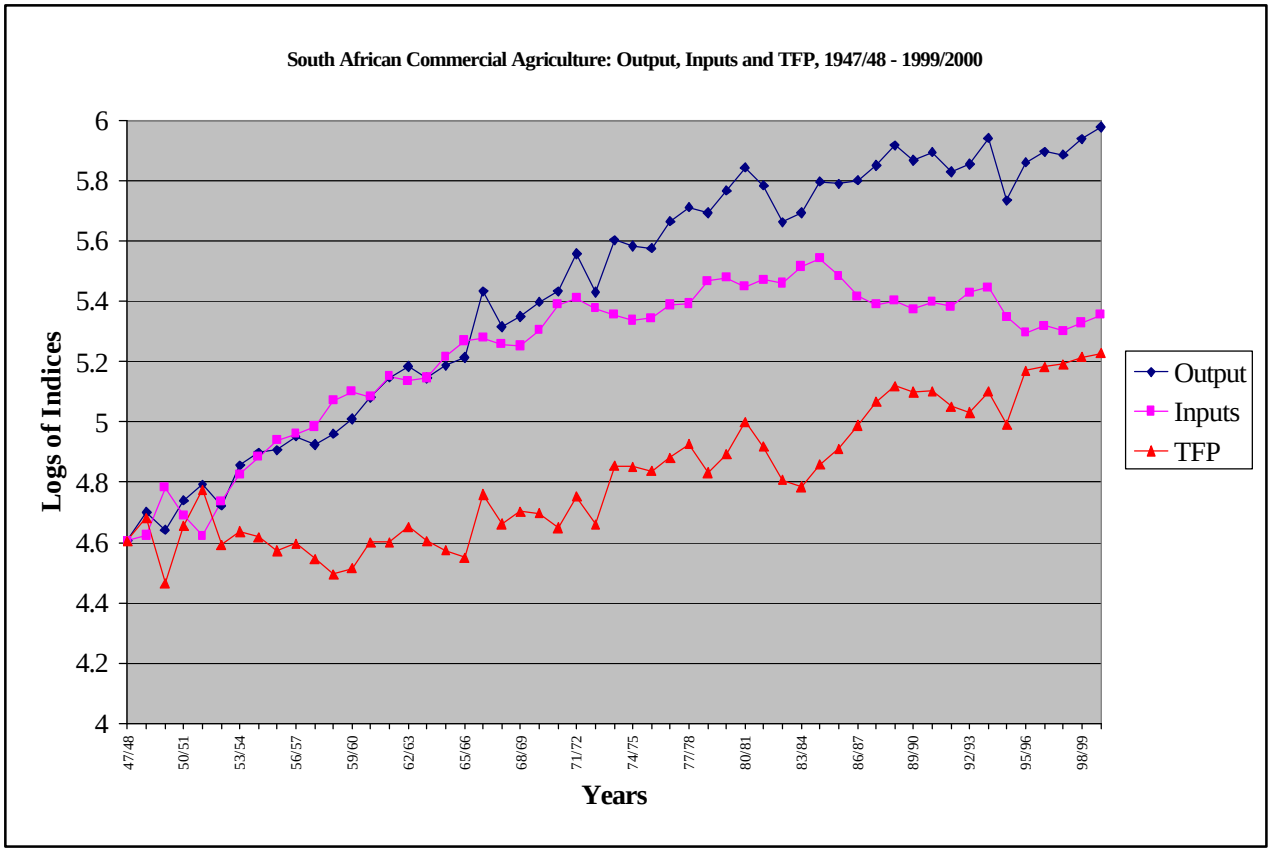
The best measure of the effects of deregulation is the Total Factor Productivity ratio. This

[3] This growth achievement had been in process for 27 months by November 2001.

conceptually simple but comprehensive indicator of productivity, which measures the ratio of the total value of output to the total value of inputs used in agriculture, is a measure of the efficiency with which resources are being used in the sector. The Figure shows that:

- Total output in agriculture had been increasing for most of the past six decades. The data in Table 3 shows that most of this growth came from the increase in the production of horticultural products, where growth is measured as a simple multiple of the output in the most recently available year over the base year[4]. Figure 2 shows that this growth in horticultural output was sufficient to increase its share of total farm output by 10 percentage points since 1978/79.

- There has been a levelling out in the value of total inputs used in farming since the early 1980s. This is the net result of a decline in the numbers of people employed on farms (although a relatively high growth in wages has resulted in an increased total wage bill), a decrease in the capital stock used in agriculture and an increase in the use of intermediate inputs. Figure 3 shows the most important result, which is that the amount of capital required to produce a unit of Net Farm Income has decreased substantially since the early 1970s.



Source: Vink, N, 2000.

[4] These data were not adjusted for inflation, as comparisons are within the same sector and the emphasis is on relative performance within the sector.

Figure 1: Outputs, inputs and TFP in South African agriculture, 1947-1999

Table 3: The composition of growth in farm output, 1965/66 to 2000/01

	Field crops	Horticulture	Animal production	Total
1965/66	407,2	181,2	487,8	1 076,2
2000/01	16796,6	12708	19485,8	48 990,4
Multiple	41.25	70.13	39.95	45.52

Source: Adapted from the Abstract, 2001.

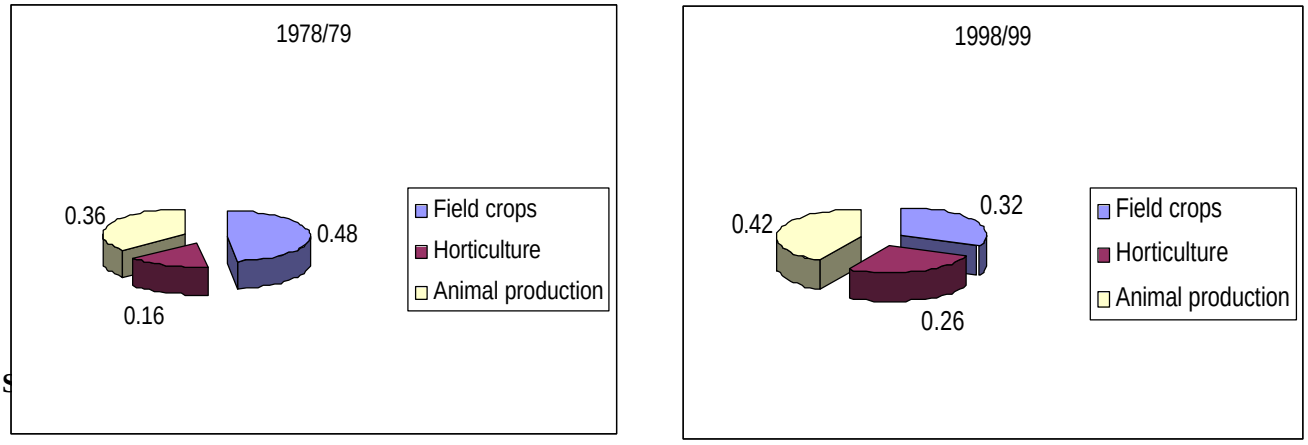
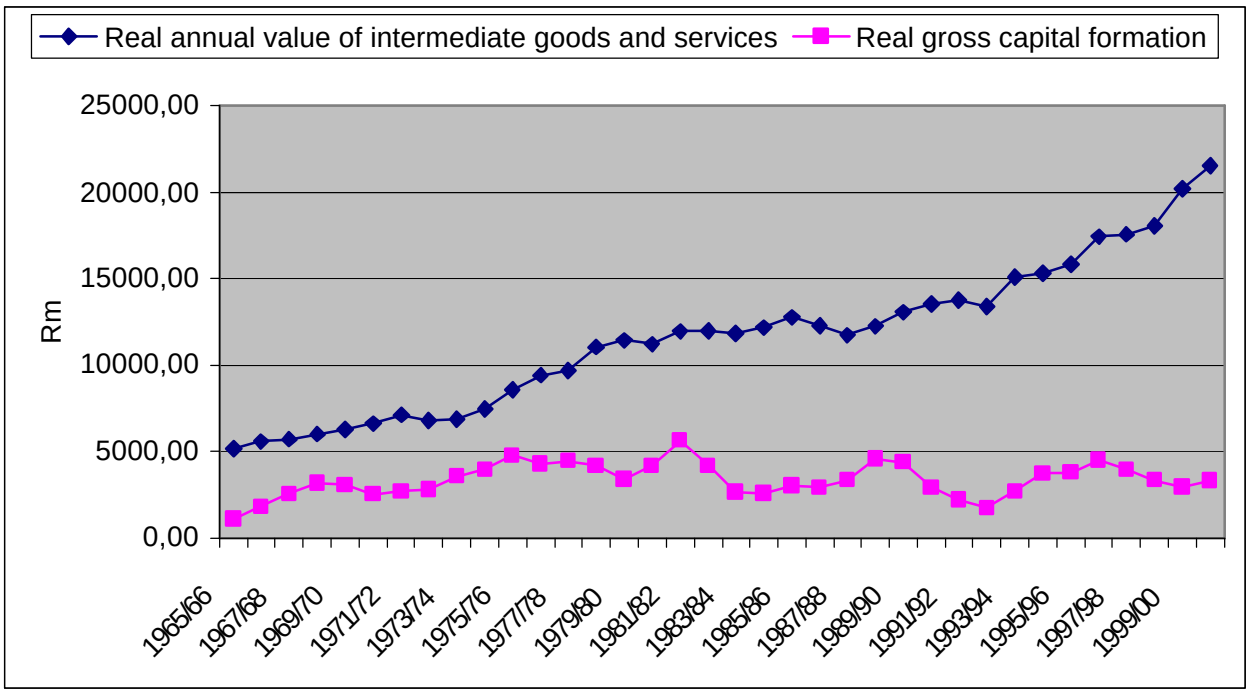


Figure 2: The changing composition of the value of agricultural output in South Africa



Source: Adapted from the Abstract, 2001.

Figure 3: The use of capital in South African agriculture

The net result of these two trends is that productivity has increased in South African agriculture at a sustained rate since 1947, that this seemed to slow down during the first part of the 1990s, i.e. after the first phase of deregulation, but that it has accelerated substantially in the post-1994 period as exports have increased. On average, therefore, the agricultural sector as a whole has gained from these policy shifts.

Profitability

There are a host of different ways of measuring the profitability of an enterprise. In agriculture, the standard measure is Net Farm Income, which is gross revenues minus ordinary costs of production, including depreciation, salaries and wages, interest paid and rent paid. However, because agriculture is so dependent on the climate, NFI fluctuates annually, and is thus less useful as a macro-level indicator of trends in the sector. For this reason, the profitability of the sector is expressed in terms of the amount of capital required to produce R1.00 of Net Farm Income over the past three decades in Figure 4. The data show a considerable change in the relative capital intensity of the sector over this period. Expressed in real terms, the amount of capital required to produce R1.00 worth of output has declined from R4.50 to less than R1.00 over this period, thus the sector as a whole has become less capital intensive.

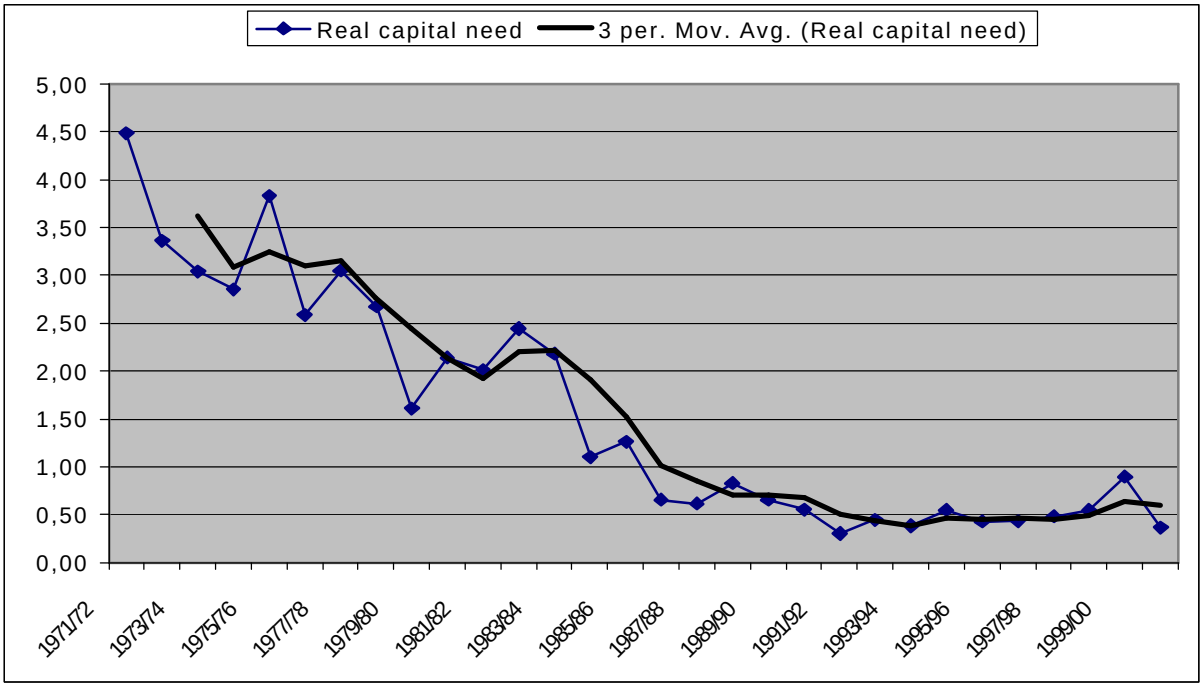


Figure 4: The amount of capital required to produce R1.00 of net farm income, 1971 - 2001

Foreign trade

The data in Table 4 show the trade performance of South African agriculture over the past two decades. The first observation is that agricultural exports have grown rapidly, especially from 1990, but that agricultural imports have grown even faster. The second observation is that, despite this rapid growth in agricultural trade, total exports and imports have been growing even faster. The result is reflected in Figure 5 below.

Table 4: Trends in South Africa's agricultural exports, 1980 - 2000

	1980	**1990**	**2000**
Exports			
Total SA exports (Rm)	19 915.4	60 770.0	253 809.0
Total agricultural exports (Rm)	2 052.5	5 289.8	15 819.0
Agricultural exports as % of total exports	10.3	8.7	6.2
Imports			
Total SA imports (Rm)	14 381.3	44 141.5	227 918.0
Agricultural imports (Rm)	369.2	2 203.3	9,643,7
Agricultural imports/total imports (%)	2.6	5.0	4.2
Exports + imports/Total production (%)	34.5	34.5	57.5
Agricultural terms of trade (Ag exports/Ag Imports)	5.56 : 1	2.4 : 1	1.6 : 1

Note: 'Openness is measured as (Exports + Imports)/GDP

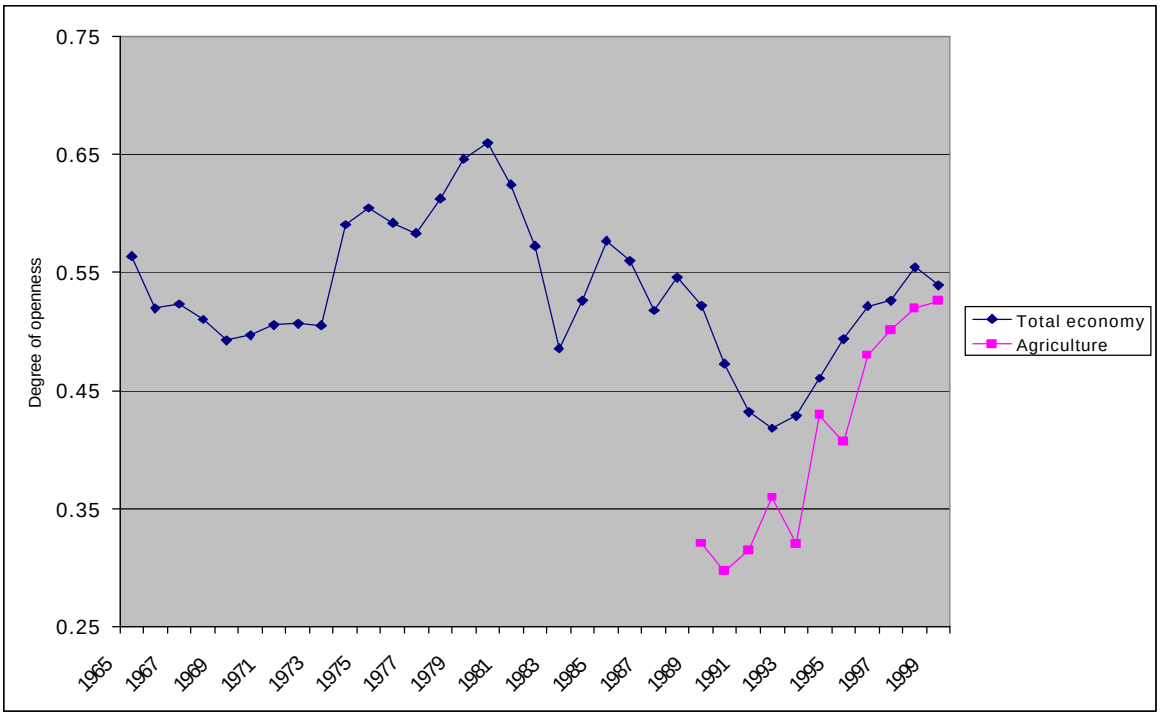


Figure 5: The degree of openness of the South African economy

In Figure 5 total exports plus total imports are measured as a proportion of total production (GDP) for the economy as a whole, while the same calculation is made for the agricultural sector. The graph shows the influence of the high gold price on the total economy in the early 1980s, and the effect of the isolation of the country in the period leading up to 1994. The data for agriculture show the extent to which agricultural trade has opened up as a result of the liberalisation of agricultural marketing, to the extent that the agricultural sector is now almost as exposed to the world economy as the economy as a whole.

Investment

Following the various processes of deregulation the real gross domestic fixed investment in agriculture increased by 24% in real terms in 1996 while investment figures in 1997 were 9% lower than 1996 but still up on 1995 levels by 13%. Investment (or gross capital formulation) in agriculture declined during 1997 – 1999 due to a few poor seasons and some elements of rural insecurity. Investment in agriculture increased again in 2000 and 2001 with the 2001 gross capital formulation back at similar nominal levels than in 1996.

The extensive liberalisation of agriculture has also led to an increase in the number of new agricultural companies registered per annum since 1985. The fastest growth was experienced in the post 1994 period, with new registrations increasing from 895 per year in 1993 to as many as 1 879 in 1997 – an increase of 209% over the number in 1993.

1.3 State intervention

State spending on the farm sector, measured as the budgeted amounts for the national Department of Agriculture plus the agricultural budgets of the nine provinces, amounted to R2.8bn in 1998. In real terms, this was 46% of the budget of the Department of Agriculture plus that of the budgets of the former homeland departments in 1988. The decline in state spending in agriculture is also illustrated by the rapid decline of government funding of agricultural research. Base line funding for agricultural research (ARC) provided by government through the parliamentary grant system dropped from a high of R337 million in 1997/98 to R262 million in 2001/2002 – equivalent to only 55% in real terms of the parliamentary grant it received in 1992.

Table 5 shows the changes in the magnitude of state intervention in South African agriculture, measured in terms of the Producer Support Estimate (PSE)[5] calculation as prescribed by the OECD. While a partial measure of government intervention, it has the advantage of allowing cross-country comparisons, as the application of the method is monitored internationally.

Table 5: Total domestic support to South African agriculture (PSE)

	1990/1	1991/2	1992/3	1993/4	1995/6	1996/7	1997/8
Total PSE Rbn	2 848	3 904	7 499	4 119	0,536	3,574	1,351
Percentage PSE	13,69	16,74	31,04	14,50	2,28	8,87	2,72

Table 6: Global comparison between % PSEs

Country	% PSE
Iceland	68.9
Japan	63.2
EU	45.3
USA	21.6
Czech Republic	17.5
Mexico	16.7
Canada	16.1
Hungary	11.8
Australia	6.8
South Africa	2.7
New Zealand	0.8

The increase in PSE in 1992/3 was the result of the final pay-off of drought-related subsidies that were granted during the previous decade. The updated PSEs show (see Table 6 above) that the degree of subsidisation for South African agriculture has reached levels that are lower than those for Australia, and comparable with New Zealand, traditionally the lowest agricultural subsidisers in the world. The conclusion that can be drawn from these data is that the output prices that South African farmers receive are market prices, i.e. that they are **relatively undistorted by government intervention**. This much can be expected after the extensive deregulation of agricultural marketing and the reduction in the budgeted amounts that has taken place.

1.4 Competitiveness in the food and food manufacturing sectors[6]

Sales in the South African manufacturing sector grew by some 2.5% per annum in real terms in the period 1996-2001, a rate close to the overall real rate of growth of the economy (DTI, 2002). By contrast, sales of the food and beverages industries grew by about half that rate, making it one of the worst performers in this sector. However, recent sales growth in this subsector has been third highest among the components of the manufacturing sector. Production in the food and beverages group accounted for about 18.5% of total manufacturing output for the country in 1996, while employment was 15.9% of total manufacturing sector employment and the wage bill 13.5% of total manufacturing sector wages. A more detailed breakdown of the subsector is provided in Table 7. These data show the both imports and exports have increased at a faster rate than industry turnover, and that the most rapid growth has been in exports. The degree of concentration in the industry in 1996 is reflected in Table 8. As expected, these show the oligopolistic structure of the food-processing sector, compared to the atomistic structure of farming. The greatest degree of concentration is found in the manufacturing of dairy products, while the grain mill products market is also relatively concentrated.

Table 7: The South African food and beverage sector

	Sales (Rm)	Employment	Exports (R'000)	Imports (R'000)
1994	78079	225527	6205634	5524284
1995	80131	219155	6752412	6291720
1996	83886	221426	8286938	6625716
1997	83607	209686	8247898	7471358
1998	81896	201594	9061613	6989492
1999	81759	203211	9122024	6468007

[5] The Producer Subsidy Equivalent (PSE) (later Producer Support Estimate) is an indicator of the level of government support to agriculture in a particular country. The PSE indicates the value of the monetary transfer to agriculture resulting from agricultural policies in a given year.

[6] This discussion is based on Esterhuizen, 2001

2000	79757	187882	10270184	6556806
2001	84689	184187	12225957	6742894
% growth	1,08	0,82	1,97	1,22

Source: DTI, 2002

Table 8: Food and beverage output in South Africa, 1996[7]

Major group and subgroup	No of firms	Relative contribution of		Herfindahl Hirschman index[1]
		4 largest firms (CR4)	10 largest firms (CR10)	
Meat, fish, fruit, vegetables, oils and fats	**480**	**0,1957**	**0,3678**	**188**
Slaughtering, dressing, packaging livestock	149	0,4688	0,6358	661
Prepared and preserved meat	119	0,5591	0,7114	989
Canned, preserved and processed fish	46	0,5778	0,7924	1346
Canned and processed fruit and vegetables	157	0,3498	0,5497	482
Vegetables and animal oils and fats	16	0,6520	0,9779	1319
Dairy products	**113**	**0,6843**	**0,8005**	**1598**
Processing of fresh milk	46	0,7079	0,8350	2430
Butter and cheese	17	0,8199	0,9743	1923
Ice cream and other edible ice	45	0,6007	0,7628	1293
Milk powder & other edible milk products	13	0,8700	0,9986	2742
Grain mill products	**283**	**0,3604**	**0,5636**	**457**
Flour	209	0,4258	0,6481	648
Breakfast foods, starches & starch products	8	0,9544	-	3005
Prepared animal feeds	72	0,3727	0,6076	522
Other food products	**821**	**0,2613**	**0,5331**	**323**
Bakery products	522	0,4526	0,6262	609
Sugar, golden syrup and castor sugar	7	0,9856	-	3098
Cocoa, chocolates and sugar confectionery	72	0,7287	0,8237	1676
Coffee, coffee substitutes and tea	15	0,8038	0,9580	2060
Nut foods	31	0,5129	0,7598	920
Other not elsewhere classified	182	0,3719	0,5012	471
Beverages	**163**	**0,4556**	**0,7455**	**760**
Distilling, rectifying and blending of spirits	97	0,6926	0,7812	1386
Beer and other malt liquors and malt	23	0,9195	0,9756	3777
Soft drinks; mineral waters	43	0,7355	0,9142	1876

[1]**Note:** This is a commonly accepted measure of market concentration, calculated by summing the squared market share of each firm in the market. An index of between 1000 and 1800 represents a moderately concentrated market, while the score for a concentrated market is in excess of 1800.

Table 9 shows that the South African food and agricultural industry as a whole is marginally competitive when measured by the Revealed Trade Advantage, a measure based on the share of the country's net trade in a specific commodity relative to its total international trade. The RTA for 1998 was 0.33, although it has improved from 1992 onwards, a period that coincides with the deregulation of agricultural marketing.

Table 9: Comparative advantage in the South African agro-food industry

	RTA 1998	RTA 1997	Trend 1980 – 98	Trend 1992 - 98
National competitiveness	0.33	0.17	=	+

Note: '+' Positive trend; '-' negative trend; '=' constant trend

[7] The concentration ratios (CR4, CR10) indicate the % of industry sales contributed by the largest 4 and 10 firms respectively. The HHI is the sum of the squared market shares of all the firms in the market. HHI values below 1000 involve no significant monopoly power, whereas those over 1 800 may raise concern

In Table 10 the competitive status of selected agro-food commodity chains is shown, according to the RTA measure.

Table 10: Comparative advantage of selected agro-food chains in South Africa

Chain	Product	RTA 1998	RTA 1997	Trends 1980 - 98	Trends 1995 - 98
Cotton chain	Cotton seed	-6.23	-5.62	-	-
	Oil of cotton seed	-0.53	-2.55	-	-
	Cake of cotton seed	-26.74	-12.01	-	-
	Cotton lint	-1.59	-1.24	=	-
	Cotton carded and combed	0.31	-1.70	-	+
	Cotton linter	0.42	0.21	=	+
Tobacco chain	Tobacco leaves	0.06	-0.83	=	+
	Cigarettes	0.59	0.42	+	+
	Tobacco products	-0.15	-0.03	=	=
Potatoes chain	Potatoes	0.85	0.86	+	+
	Potatoes, frozen	0.07	0.05	=	=
Tomatoes chain	Tomatoes	0.13	0.07	=	=
	Tomato juice	0.36	-0.08	+	+
	Tomato paste	-0.07	-0.06	=	=
	Peeled Tomatoes	-0.57	-0.78	=	=
Beef chain	Cattle	-1.46	-3.76	-	+
	Beef and veal	0.23	-0.13	=	+
	Beef dried salt smoked	0.19	0.34	=	+
Maize chain	Maize	2.44	3.72	+	+
	Flour of Maize	28.55	10.10	+	+
Soybean chain	Soybeans	0.17	-0.11	=	+
	Oil of Soya beans	-0.85	-0.43	=	=
	Cake of Soya beans	-1.62	-1.53	-	-
	Soya sauce	-0.30	-0.27	=	=
Sugar chain	Sugar (Centrifugal, Raw)	8.88	3.00	+	+
	Sugar refined	2.08	1.86	+	+
	Sugar confectionery	0.32	0.39	=	=
	Maple sugar and syrups	-0.02	-0.03	=	=

CHAPTER 2

TRENDS IN FOOD PRICES IN SOUTH AFRICA

2.1 Food demand

Any investigation of the impact of food price rises in South Africa has to take into account the nature of the consumer market in the country. In 2000, South Africa's total personal disposable income was estimated at R603 601m, with a per capita value of R13 502. Since 1960 total personal disposable income has grown at an average rate of 3.6% per annum, while per capita income has grown at a much lower rate, namely 1.1% per annum.

A key feature of the South African economy is its extremely skewed distribution of wealth and income. Table 11 shows the distribution of personal monthly income by population group. 37% of all South Africans fall in the low-income group of whom 83.06% are Black, 10.57% are Coloured, 1.55% are Indian/Asian and 4.81% are White. In the case of the high-income group more than 80% are White, while fewer than 14% are Black. This racial income distribution pattern is, however, becoming less distinct. More than two thirds of all personal disposal income is found in the metropolitan areas of the country. Gauteng province is the country's commercial centre and it has the largest proportion of high-income consumers. The poorest quintile in each of the main metropolitan areas spends between 30% and 40% of their income on food, while the richest quintile spends in the region of 10-15%.

Table 11: Distribution of personal monthly income by population (% of group)

Income Group	African/Black	Coloured	Indian/Asian	White	Total
Low	83.06	10.57	1.55	4.81	37.29
Low-Middle	67.62	13.88	4.27	14.23	42.45
Middle	34.65	10.08	6.32	48.95	15.18
High-Middle	14.89	4.25	5.20	75.66	4.38
High	13.04	2.62	3.95	80.39	0.71
					100.00

Source: Census 96

The South African retail sector can be categorised into a formal and an informal component. Since the 1980s the informal retail component, which include hawkers or street markets, spaza shops, shebeens and tuck shops has been gaining market share. Nevertheless, four retail chains dominate the formal South African food retail sector. Table 12 shows their level of turnover as well as changing market shares between them. The stores are arranged in ascending order of penetration in the A-income category, where turnover has been growing faster than among lower income categories.

An important development within the South African retail sector is its increasing investment in SADC regional operations. For example Shoprite-Checkers operates 16 stores in Zambia. This trend has implications for the SA agro-food sector in that many of the goods retailed in these regional branches are South African in origin. In the case of Shoprite-Checkers (Zambia), approximately 40% of its product is sourced from South Africa.

Table 12: South African retail chains: turnover and market share

	Rm 1998	Market Share 1998	Market Share 1992
Shoprite Group	16100	42.6	49.2
Shoprite	14400	38.1	23.5
OK Stores	1700	4.5	25.7
Pick 'n Pay Group	10900	28.9	32.1
Pick 'n Pay	9900	26.2	29
Score	1000	2.7	3.1
Spar	8900	23.5	15.8
Woolworths Food Division	1900	5	2.9
Total	**37800**	**100.00**	**100.0**

The data in Table 13 provide an indication of the prices charged in these stores. The basket of goods described here is around 50% more expensive in Mozambique and Zambia compared to South Africa, and twice as expensive in Malawi. The highest price premiums are found in processed products such as cooking oil, flour, rice and cheese.

Table 13: A comparison of grocery retail prices in the SADC region

Product	Description/Notes	South Africa Price[1] (R)	Zambia Price[2] (R[3])	Malawi Price (R[4])	Mozambique Price (R[5])
Eggs	6 x Large (cardboard tray packaging)	3.19	5.20	7.10	4.71
Cooking oil	750ml plastic bottle	5.69	8.60	12.35	8.56
White sugar	2kg bag – paper bag packaging	8.63[6]	10.50	12.35	14.12[7]
Flour	2.5kg all purpose –paper bag packaging	7.99	18.96	30.87	10.59[8]
Chicken	Whole fresh chicken per kg – packaging = polystyrene tray and plastic	14.99[9]	20.50	21.61	17.11
Tomatoes	Grade 1 per kg – loose sell	8.79	3.88	10.80	3.64
Potatoes	Grade 1 per kg –loose sell	3.49	5.00	10.19	5.13
Milk	Litre - plastic bag	3.39	5.15	7.72	5.34
Bread	Standard brown loaf	2.79	3.50	4.63	1.28
Cheese	Per kg – cut from block –plastic wrap	33.90	87.53	73.64	58.61
Tea	100g loose tea – silver foil pack	3.20[10]	2.00	12.35	13.90
White Rice	1kg bag –sealed plastic bag	3.59	7.25	7.72	6.63
Maize Meal	12,5 kg breakfast (roller meal – cloth bag)	29.99[11]	23.96	57.88	42.78
Soap	250g body soap – sealed plastic package	1.49[12]	3.88	5.71	3.20
Total		**131.12**	**205.91**	**274.92**	**195.60**

[1]Prices collected from Shoprite Stellenbosch on 13/11/2001; [2] Prices collected from Shoprite Manda Hill on 9/11/2001; [3]1 ZAR=399.864 ZMK (13/11/2001); [4]1ZAR = 6.47899 MK (13/11/2001); [5]1 ZAR = 2,337.31 MZM (13/11/2001); [6]SA sugar sold in 2.5 kg paper bags, converted this to 2 kg; [7]Price per kg; [8]No equivalent packaging, average price for 1 kg price and 5 kg price; [9] Thick plastic – no polystyrene tray; [10]Teabags – loose tea not available 62,5 g converted to 100g; [11] Converted this to 12,5 kg – SA product 10kg in paper packaging; [12] Paper packaging

Thus, while the South African consumer market is still segmented, inequality is decreasing, and the purchasing power of the wealthiest part of the population is increasing. As a result, the largest impact of food prices will be on poor people, most of who live in the rural and peri-urban areas of the country.

2.2 Inflation and food price inflation

It has become apparent in recent months that the increasing inflation rate in South Africa is largely the result of an increase in food price inflation. However, it is necessary, first, to take a longer-term perspective on food price inflation. The trends are shown in Figures 6 and 7 below, which show the trends in food price inflation in conjunction with the process of deregulation of agriculture. These data show that deregulation was characterised by a lowering in the rate of food inflation (i.e. during the period when the general rate of inflation in the country was brought to below double digit figures for the first time in two decades), and by a reduction in the variability of food price changes. This is a key finding that serves as a warning against attempts to reintroduce the control measures that existed prior to the promulgation of the Marketing of Agricultural Products Act in 1996.

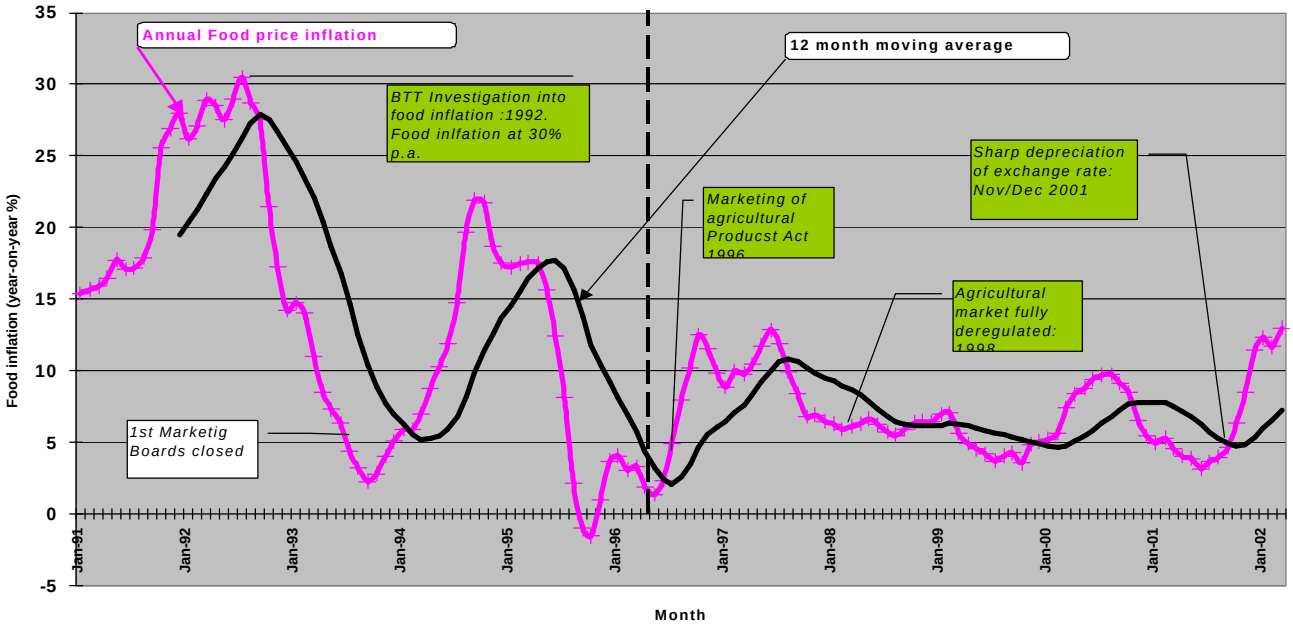


Figure 6: Food price inflation and deregulation

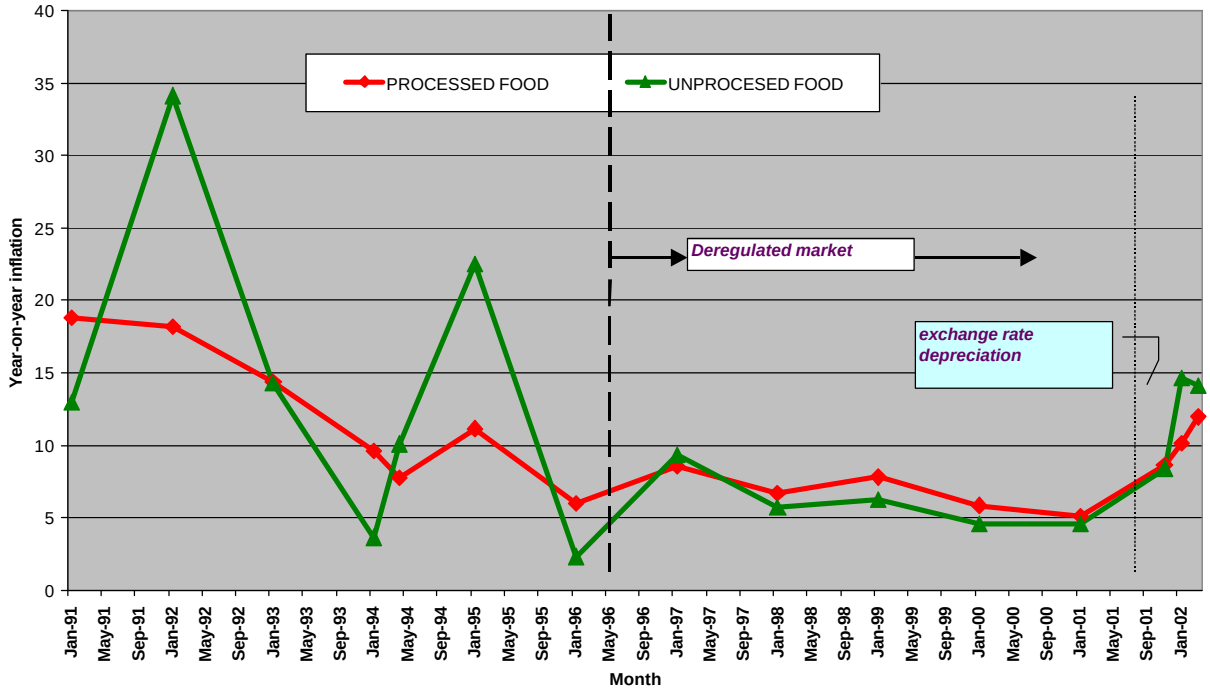


Figure 7: Inflation in the prices of processed and unprocessed agricultural products

As far as the short-term situation is concerned, the April Statistical Release of StatsSa states the position clearly:

> "The headline inflation rate at April 2002 … is 8,0%. This rate is the highest since February 1999 when the rate was 8,6% … The official inflation rate … is 1,4 percentage points higher than the corresponding annual rate of 6,6% at March 2002 …, mainly due to larger annual contributions … in the price indices for food (with a contribution of 2,9 percentage points to the 8,0% official inflation rate) …

The trend since 1998 is shown in Figure 8a below. Here it is evident that when CPI-food was growing at a relatively constant rate (up to the end of 1999), the overall inflation rate was declining. However, between the end of 1999 and the middle of 2000, and again from the middle of July 2001 it is clear that the increase in CPI-food has preceded an increase in the overall rate of inflation. The interpretation is emphasised by Figure 8b, which shows the difference between the CPI and CPI-exFood thus illustrating the important contribution of food inflation to total inflation over the last few months. The reason for the relatively large increase in the price of food is shown in Table 14 below.

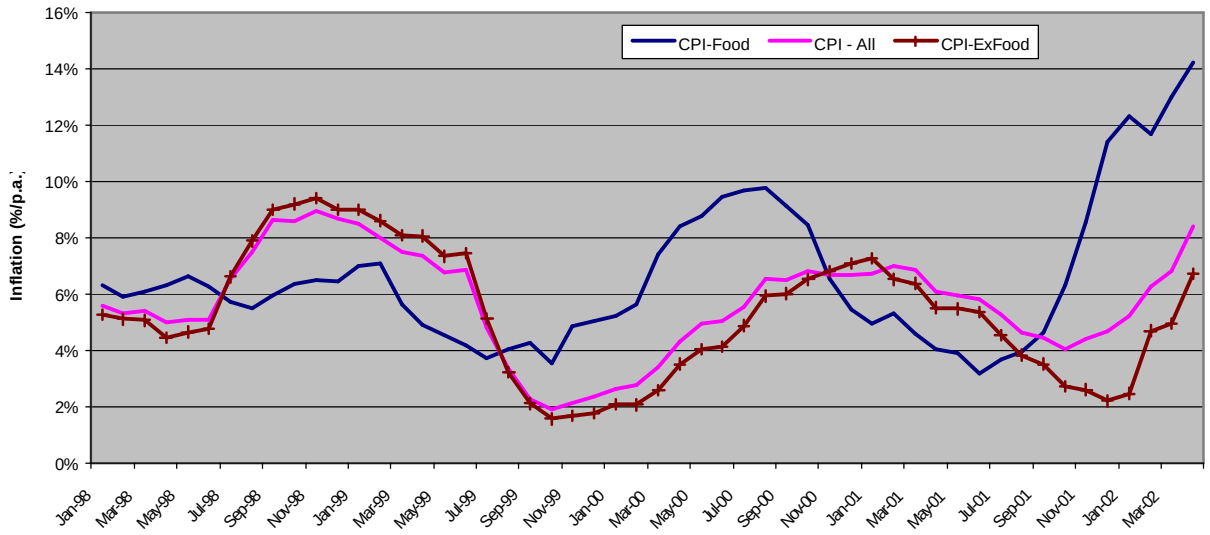


Figure 8a: Annual increase in the CPI for food, Jan 1998 to April 2002

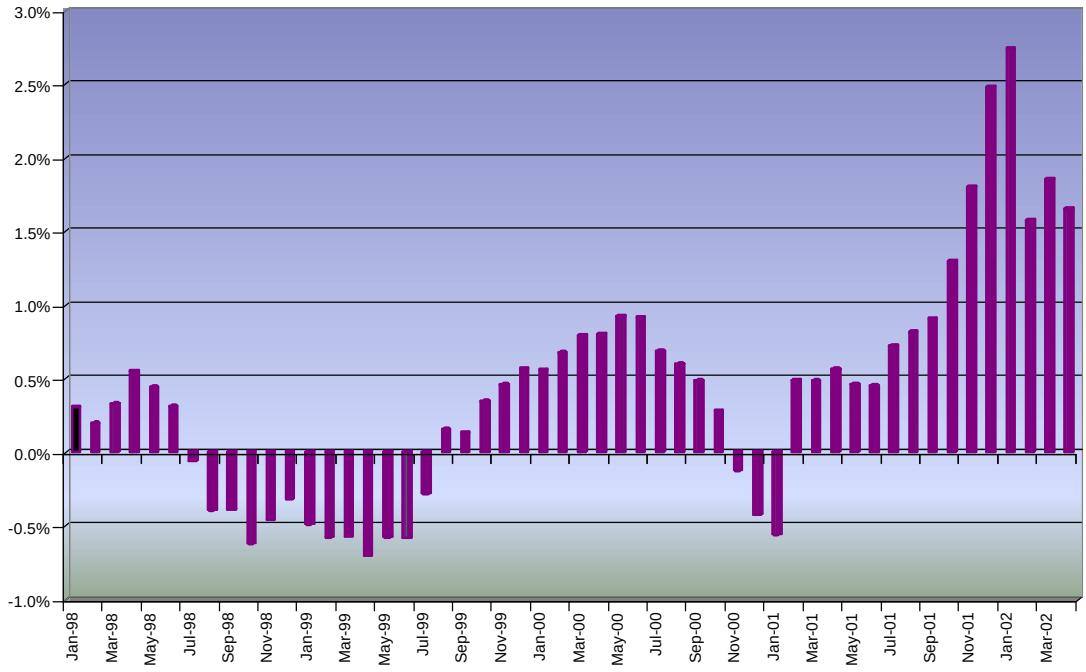


Figure 8b: Difference between annual increase in CPI-all and CPIex-food, 1998 – 2002 (percentage points)

The data in Table 14 show that the main reason for the increase in the Consumer Price index for Food over the period March to April 2002 was the increase in the price of grain products, of milk, cheese and eggs, and of fats and oils, fruit and nuts, and coffee, tea and cocoa, which all increased at a rate higher than the average for all food products.

Table 14: The contribution to CPI Food, April 2001 to April 2002

		Percentage change between	
Product	**Weight**	**March 2002 to April 2002**	**April 2001 to April 2002**
CPI		1,8	8,0
CPI Excluding food	79,01	1,8	6,3
Food (total)	20,99	1,5	14,2
Grain products	3,81	2,4	14,3
Meat	5,66	0,9	15,1
Fish and other seafood	0,69	1,3	12,9
Milk, cheese and eggs	1,96	2,0	16,0
Fats and oils	0,76	2,6	19,1
Fruit and nuts	1,09	1,7	6,2
Vegetables	2,00	0,6	23,5
Sugar	0,50	1,1	8,8
Coffee, tea and cocoa	1,07	2,3	11,3
Other	3,45	0,5	7,6

Source: StatsSa

The food products that had larger than average increases for the period April 2001 to April 2002 are vegetables, grain products, meat, milk, cheese and eggs, and fats and oils. The hypothesis is that these price increases are related to the weakening of the exchange rate in the last six months of 2001. As will be shown below, the exchange rate directly influences the price of products that have to compete with imported goods, hence the increase in the price of grain products. Grain products are also the single largest input in the production of meat, and of milk, cheese and eggs, hence the increases in the prices of these products. The exchange rate will also directly influence the price of imported products such as fats and oils, and coffee, tea and cocoa. Increases in the price of fruits and nuts, and of vegetables, are expected to be unrelated to the exchange rate and mainly influenced by the normal seasonal effects.

2.3 The maize price increase of 2001/2002

The motivation for this study came largely from concerns raised over the steep increase in the producer price of maize at the end of 2001. The public outcry was unsurprising, as white maize is the staple food in the country, and yellow maize is the single most important input in the dairy, pig, beef, and poultry industries. Thus, an increase in the price of maize implies that the price of maize meal as well as of all the major sources of proteins such as milk, milk powder, butter, cheese, eggs, poultry and pork will increase.

The analysis of pricing behaviour in the market for grains is, therefore, the key focus of this study, following from the hypothesis that the sharp increase in the price of maize has been the most important driving force behind the recent increase in food price inflation. Thus, the first question to be addressed is **why did the price of maize increase?**

The working of the market for grains

The discussion in Chapter 1 showed that the Marketing of Agricultural Products Act of 1996 paved the way for a new marketing order in the South African grain industry. Grain producers, traders and processors are now able to trade in a 'free' market, responding to the forces of supply and demand in setting prices. In practice, they all look to the prices generated through the formal commodities market that was established following deregulation, namely the Agricultural Markets Division of the South African Futures Exchange (SAFEX) as the benchmark for the prices they ask or offer in the 'spot' market of daily trading in maize. SAFEX was formed in 1996/1997, and introduced the trading of derivatives (futures and options) for white maize, yellow maize, wheat, sunflower and beef (the contract for beef was later cancelled). The prices for future contracts and options are generated on the exchange through 'bids' and 'offers' and reflect the views of market participants on the prices of the specific products at different dates in the future. These instruments are also used to hedge price risk. By using the SAFEX market effectively, market participants can minimize their price risk, which in turn lowers their cost of doing business. These savings can then be passed onto the consumer in the form of lower prices for food and other commodities. Later in the chapter we show that retail prices of food and maize in particular has not increased in the same way than producer prices.

SAFEX prices come about as a result of the views of different participants in the market about the direction that prices are going to take, thus the market is driven by their assessment and interpretation of information regarding the future level of prices for the different agricultural commodities. The supply and demand factors that affect the prices of products in the future include weather conditions, consumer preferences, government policy, trade agreements, changes in living standards, and technology. In a free market producers compete with each other and also with foreign producers in order to maximise their own profits. Consequently, individual producers have no alternative but to take the best price possible – be it the local price or the international price.

The technique used to calculate the prices at which producers can sell their product locally or internationally is known as an import/export parity calculation. For example, if grain millers can buy imported maize (including the cost of transport, insurance, the tariff, the exchange rate, etc.) for cheaper than locally produced maize, they will do so until local producers are able to supply maize as cheaply. This is called an **import parity price**. On the other hand, if South African maize producers can sell their maize to foreign millers at a better price than local millers are prepared to pay, South African maize will be exported until local prices have increased to the level of the export price. This is an **export parity price**.

The result is that the price of maize on the domestic market will normally go no higher than the import parity price, as millers will merely increase imports at that point. Thus, the import parity price is a maximum price. In the same manner, the export parity price is the lowest possible price, i.e. it is a minimum price. Therefore, the domestic price of maize will fluctuate between these two levels. This is illustrated in Figure 9. For example, if the exchange rate depreciates, South African maize producers will be able to sell at a higher price in foreign markets. If this price is high enough to cover the cost of exports, there will be an increase in exports of maize, a decrease in local supply and thus an increase in the domestic price, until the domestic price equals the price received from exports. The opposite result will arise if the local price rises above the ceiling price and the product can be imported for a lower price than it is produced locally. The actual level of the domestic price between this minimum and maximum level will depend on local (Southern African) supply as well as demand in the local market, recognising that the latter is relatively stable in the short to medium term. A more practical illustration of how the domestic price of maize comes about is provided in the next sub-section.

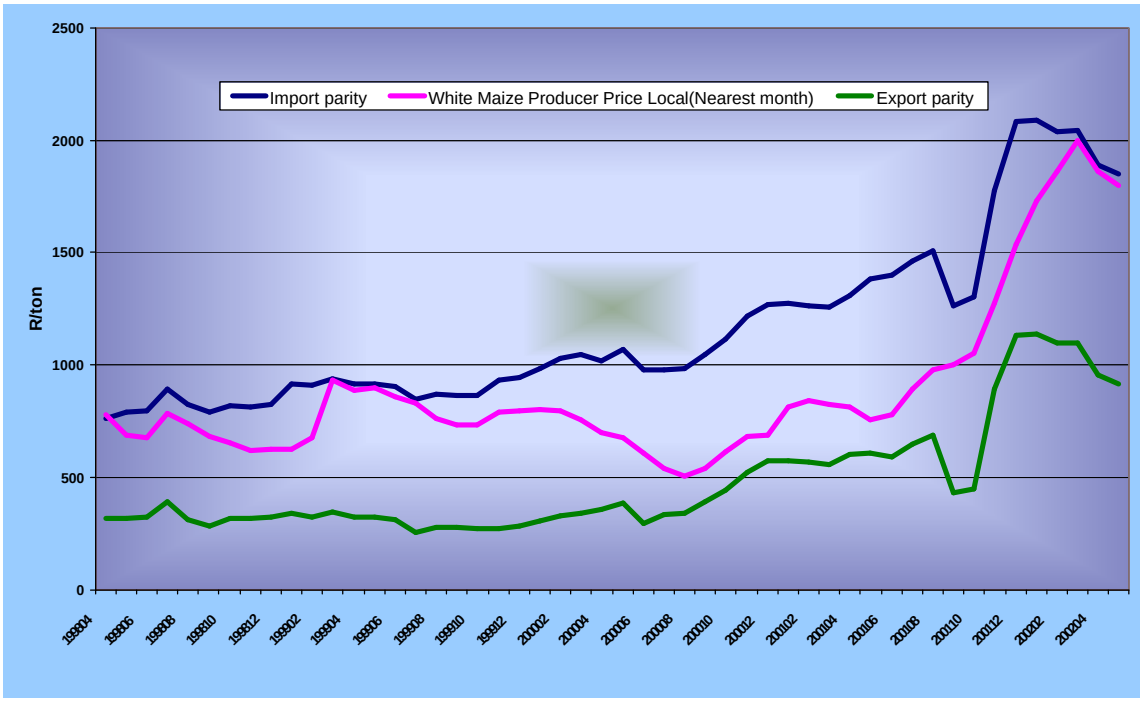


Figure 9: Illustration of how SAFEX spot prices fluctuate between import parity and export parity (April 1998 to May 2002)

The determinants of the domestic price for maize

The illustration above shows that the main influences on the price of maize that a South African buyer pays is the world price for maize, the exchange rate[8] and the relative size of the domestic (Southern African) maize crop. The mechanism for reaching the domestic price of white maize can be illustrated with reference to actual prices ruling in the South African market between 2000 and 2002. The data are provided in Table 15 below.

Table 15: Calculation of import parity prices for white maize

Year	Area Planted	Crop	Fob Gulf Price	CIF Randfontein price (import parity price)	Exchange Rate	Safex
	Mil Ha	Mil Tons	$/t	R/t	ZAR/$	R/t
1999	3.227	6.71				750
2000	2.708	8.97	79.980	1239.992	6.960	519
2001	2.84	7.225	94.170	1559.563	8.450	1022
2002		??	90.720	2000.56	11.610	2008

Note: All data for 1st of September except for 2002, which is at 1 February 2002

Maize that is physically located in the United States does not have the same value to a South African buyer as does maize that is physically in the EU or in South Africa. Hence, the price of maize in different markets must be adjusted to take account of the differences in transport costs, exchange rates, etc. in order to make comparisons possible. Such an adjusted price is called a **reference price,** and must be calculated with respect to a **reference point.** In the case of grains in South Africa the commonly used reference point is Randfontein.

[8] The other costs (foreign currency costs of freight, insurance, etc; as well as the domestic costs) are important, too. Evidence shows, however, that they are more stable than the world price and the exchange rate.

In order to adjust all prices to this reference price, the international commodity price ('free on board' or fob Gulf price[9]) has to be adjusted to take account of all the costs incurred in bringing the maize to Durban. This price, called the CIF price[10], is adjusted into local currency using the current exchange rate. Once this is done all local Rand based costs (off-loading, losses, interest, local transport costs) can be added to result in a final landed (local) price per ton at the point of consumption or the reference point.

During this period the dollar price of white maize increased by $10.74/t (from $79.98 to $90.72, or by 13.38%). During this time the exchange rate also weakened, by 66.67% (from R6.96 to R11.61, or by R4.65). According to the explanation provided thus far, this should cause the import parity price to increase, and hence the domestic price of maize will also increase. Maize buyers in South Africa, e.g. millers, have to buy maize from producers who can sell their produce overseas at the higher world price and with a more favourable exchange rate. Hence, they will bid up the domestic price of maize.

Whether the domestic price of maize, as a result, goes up to the maximum level of the import parity price depends on the relative scarcity of maize in the domestic market. If there is a domestic shortage, due for example to drought, prices will move to import parity and if there is excess supply prices will go down, but no lower than export parity. To illustrate, in 2000 the import parity price of white maize was R1239/t but producers only received R519/t, largely due to the good harvest in South Africa and the neighbouring countries. This caused a drop in the area planted to white maize (from 3.227m ha in 2000 to 2.708m ha in 2001) as producers switched to more profitable enterprises. This caused a decline in output (from 8.97m tons in 2000 to 7.225m ton in 2001).

An additional factor that has to be taken into account in that period is the effect of the political turmoil and farm invasions in Zimbabwe, which resulted in a large drop in area planted to food grains such as maize in that country. Within two years Zimbabwe changed from a surplus producer and exporter of maize to a deficit producer and importer. The combination of these two factors plus reports of crop failures in Zambia and Malawi changed market sentiments from the surplus in 2000 to a predicted deficit in the whole SADC region in 2001. The predictable result was that the domestic price increased to the level of the import parity price within a year. At the same time import parity prices increased by 73% for white maize and 75% for yellow maize between September 2000 to February 2002.

Thus, the rapid increase in the price of maize came about as a result of the effect of the weakening in the exchange rate and the increase in the world price on the price band within which the domestic price moves. Within this band, the domestic price then increased as a result of the perceived shortage on the domestic market, fuelled by the irresponsible actions of the Zimbabwean government.

The argument thus far has been based on a comparison of the international price with the SAFEX price. However, the latter is a price based on a promise of future delivery. Hence, the logical next question is the extent to which the SAFEX price is an indication of the actual market price or spot price for a particular commodity.

[9] This means that the supplier delivers the maize at a price that is equivalent to loading the maize onto a ship in the Gulf, i.e. the buyer will pay for the transport, insurance, etc. to get it to where they need it. The world price for maize is conventionally quoted as fob Gulf.

[10] Cost, insurance, freight.

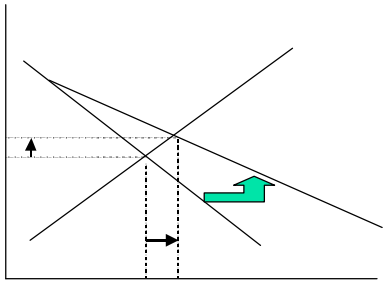
Futures prices and spot prices

At any given point in time there will be more than one contract listed on SAFEX for the same commodity. The only difference between the various contracts is the date of expiry. For example an April 2002 expires on 20 April 2002 and a March 2003 contract expires on 20 March 2003. The contracts will trade at different price levels with the contract with the latest expiry date trading at the highest price (Note: This applies only to the current crops. With the new season commencing contract prices for the new season crop might differ completely). The difference in the price levels will equate to all costs (storing and financing costs) from one period to the next. For example, the September 2002 will trade at R1900/t and the December 2002 at R1950/t, the difference being R50 per ton. The amount of R50/t will be roughly equal to costs involved in storing maize from September to December.

BOX 1: The Free Market and Total demand

In a free market farmers, traders and processors make decisions as rational players in a competitive market. In such a market one would therefore expect that international arbitrage drives prices. If millers could get imported maize to South Africa cheaper they will do so and this will drive local prices down. But when the landed price goes up and supply is just sufficient to meet local demand local prices will be on par with the 'import prices'.

Total Demand: In an open market with little to no trade restrictions demand for a commodity implies not only local demand. Total demand for the commodity includes local demand plus export demand – i.e. the demand by importing countries such as Zimbabwe, Malawi and Zimbabwe (The new demand curve to the right in the figure below). For a commodity such as white maize the total demand will thus include the demand from neighbouring countries. When these countries experience shortages they will demand more maize from South Africa thus shifting the total demand curve to the right putting a further upward pressure on the maize price. When total demand is outstripping local supply (implying thus South African production) additional supply will have to come from imports outside the region. This is then when the import parity calculation will indicate the prices at which maize will be landed here.



One of the contracts being traded on SAFEX will always have an expiry date equal to the current month. For example, if it is now the month of April 2002 there will be a contract with an expiry date of April 2002. This continued existence of a contract ready to expire creates the constant delivery month contract. In other words, there will always be a contract that is ready for delivery, which implies that a producer can always find a contract on SAFEX against which he can deliver immediately. If a producer happens to have maize ready for delivery in April 2002 he/she can take an April 2002 contract position on SAFEX and delivery can proceed within a matter of days. For all practical purposes the price of the deliverable contract (or delivery month contract) thus represents the current market price or spot price for SAFEX.

However, contrary to the days of the Control Boards, there is no longer any pan-seasonal or pan-territorial pricing[11] or one single spot (producer) price for the country as a whole. There are as many different spot prices as there are points of delivery. An adjustment for transport cost is, therefore, done for each delivery point. Since all SAFEX prices are Randfontein based, this means that if a producer can deliver or a miller accept delivery at Randfontein, they will receive or pay the SAFEX price for the delivery month contract (the spot price). Since delivery usually takes place at points across the various producing regions, all spot prices will be a SAFEX adjusted price. For example if the transport costs between Randfontein and the silo where a producer chooses to deliver is R80/t, the delivery price for the producer will be equal to the Randfontein price (the delivery month

[11] The Maize and Wheat Boards set a buying price for the product regardless of when or where it was delivered. The result was that the transport cost of farmers further away from the market was subsidized by those closer to the market, while no producer had an incentive to store the product. This had an enormous impact on liquidity management by the monetary authorities when the entire crop was purchased within a couple of weeks every year.

contract price) minus the R80/t transport cost. The buyer will now collect the maize from the relevant silo at the SAFEX price minus the R80/t. These transport cost differentials are calculated every year and are available from SAFEX. Thus, the SAFEX futures prices are indeed the true market or spot prices for every delivery month.

Testing for the causes of the maize price increase

The discussion so far and the analysis of price trends in Section 2.4 below suggest strong arguments and evidence for showing that there is a close correlation between farm gate prices and the R/$ exchange rate in the case of every commodity analysed. However, these results should be interpreted with care and need to be **tested statistically** to prove beyond reasonable doubt that the exchange rate has been one of the major factors contributing to the producer price increases.

Although the evidence suggests a strong correlation between the movements in the exchange rate and the SAFEX spot price, correlation does not necessarily imply causation in any meaningful sense of that word. The econometric graveyard is full of magnificent correlations, which are simply spurious or meaningless. As a result, the analyst has to test for causality to answer the question whether the exchange rate depreciation **caused** an increase in grain prices.

The Granger (1969) approach to the question of whether x (e.g. the R/$ exchange rate) causes y (e.g. the spot price of maize) is to see how much of the current y can be explained by past values of y and then to see whether adding lagged values of x can improve the explanation. Y is said to be Granger-caused by x if x helps in the prediction of y, or equivalently if the coefficients on the lagged x's are statistically significant[12].

The Granger test for the white maize producer price shows that we can say with 99% confidence that changes in white maize prices were preceded by changes in the R/$ exchange rate, with a lag that is usually not more than 10 days or 2 working weeks. In the case of yellow maize a similar result was found, but the lag was much shorter at as little as one working week or 5 days.

In the case of sunflower and wheat the results of the test were not that clear and no conclusive evidence could be found that prices were affected by the exchange rate changes. In the case of these commodities, there could have been other factors that influenced the prices.

Apart from the Granger test we used a regression model to determine the effect of exchange rate fluctuations and import costs on the SAFEX white maize spot price. In this model the SAFEX spot price for white maize was modelled as a function of the exchange rate, exchange rate lagged one month, c.i.f white maize price Durban port in U.S. dollars, and the cost of discharge, tariff, and transport of the maize to Randfontein as a single variable, namely import costs.

All the variables, with exception of the import costs, were statistically significant at the 90% level. The R-squared of the model indicates that 96% of the variation in the real SAFEX white maize price was explained by the independent variables. The elasticities of the different variables are as follows:

Box 2

Variable	Elasticity with real SAFEX white maize price
Nominal exchange rate	1.05
Exchange rate lagged 1 month	0.51
Nominal c.i.f white maize price Durban port	0.54
Import costs	0.25

[12] Note that two-way causation is frequently the case; x Granger causes y and y Granger causes x. It is also important to note that the statement 'x Granger causes y' only means that x comes before y, and not that y is the effect or the result of x. Granger causality measures precedence and information content but does not by itself indicate causality in the more common use of the term. Nevertheless, it provides stronger evidence of causality than a simple correlation.

The elasticity results show that a 1% increase in the current exchange rate will cause a 1.05% increase in the white maize SAFEX price, while a similar increase in a 1-month lagged exchange rate will cause a 0.51% increase. It should however be noted that the high elasticity for the exchange rate probably also reflects the fact that the market is much more sensitive to an exchange rate depreciation when the crop is short and when stocks are low or when the regional market is short as is the case in 2001/2002. The high exchange rate elasticity (and thus the large change in price levels) is also a consequence of the fact that the market had some ground to make up from far below import parity levels. This explains the large response in terms of the SAFEX price when reports of the short crop in the region became known. A 1% increase in the c.i.f. Durban port white maize price in U.S. dollars will cause a 0.54% increase in the SAFEX price. Similarly a 1% increase in import costs will cause a 0.25% increase in the SAFEX price. This shows that world prices and the exchange rate make a statistically significant contribution towards the level of producer prices quoted as the price of the near month SAFEX contract.

This discussion has, therefore, shown that the domestic price of maize reacted in a predictable fashion to the change in the exchange rate and the international price of maize, to market perceptions of the relative scarcity of maize in Southern Africa and to the food crisis in Zimbabwe at the end of 2001. There is, therefore, clearly no evidence of price manipulation or of unfair price policies in determining the price of the basic commodity.

2.4 Trends in farm gate prices

In this section the trends in nominal and real farm gate prices in South Africa are analysed for a wide range of commodities[13]. The seasonal and cyclical nature of farm prices, and thus their variability, is also illustrated. This will be contrasted with the more consistent increases in retail prices later in the analysis. The factors driving these price trends are also identified and analysed.

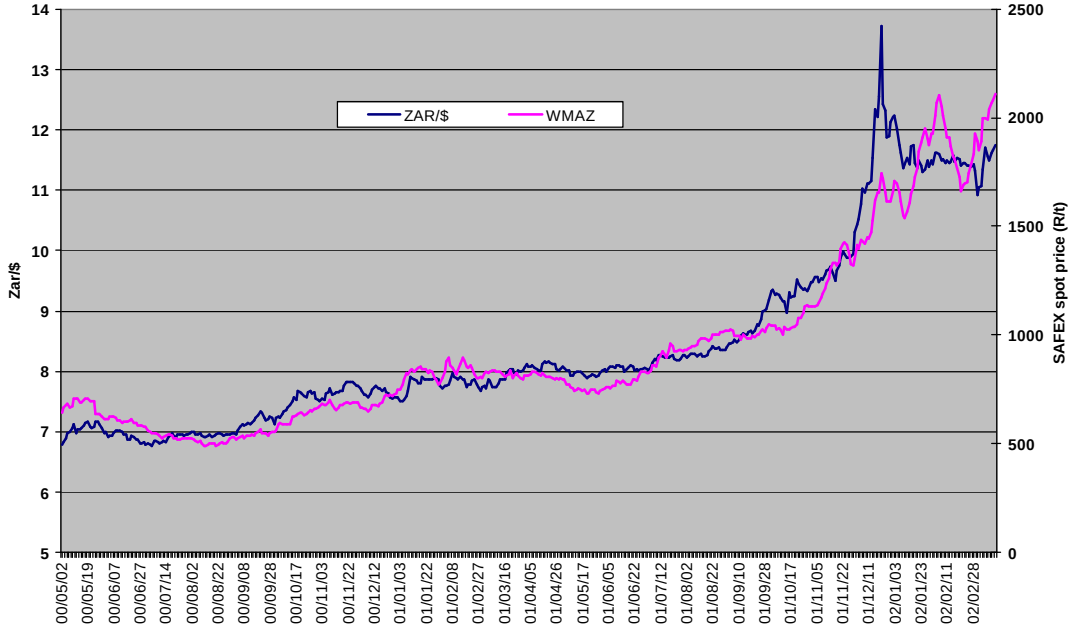
2.4.1 Cereals and grains

Chapter 1 provided an overview of the process of deregulation in the agricultural market and illustrated that South Africa's agricultural economy is now 'open' and susceptible to changes in the world market and other exogenous factors. South African farmers are now operating in a free market. It has taken more than 5 years and many casualties for farmers to adjust to this 'new game'. This process of adjustment has been more difficult for farmers from disadvantaged communities, who are now entering the mainstream agricultural economy.

Maize

Figure 10 depicts the trend in the producer price of white maize plotted against the trend for the R/$ exchange rate since May 2000. The data show a remarkably strong correlation between the two variables. Figure 11 provides the trend over a longer period (since 1999), showing a weaker correlation in the years prior to 2000. This is largely the result of other factors, such as the large crop and low prices in 1999/00, leading to lower plantings in 2000, as explained above. This analysis is repeated for yellow maize in Figures 12 and 13.

[13] Maize meal, Cooking oil, Bread, Wheat flour, Dry beans, Fresh milk, Cheese, Butter, Mutton, Beef, Eggs, Chicken, Potatoes, Tomatoes, Pumpkin, Apples, Oranges, and Bananas.



Source: SAFEX/AMD and Reuters

Figure 10: White maize producer price vs. the R/$ exchange rate, May 2000 to March 2002

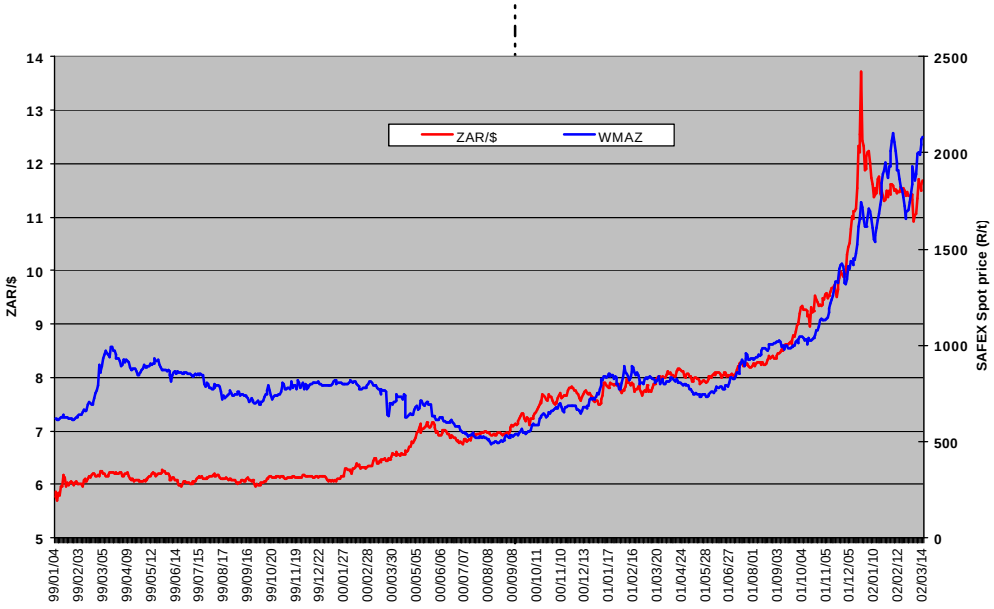
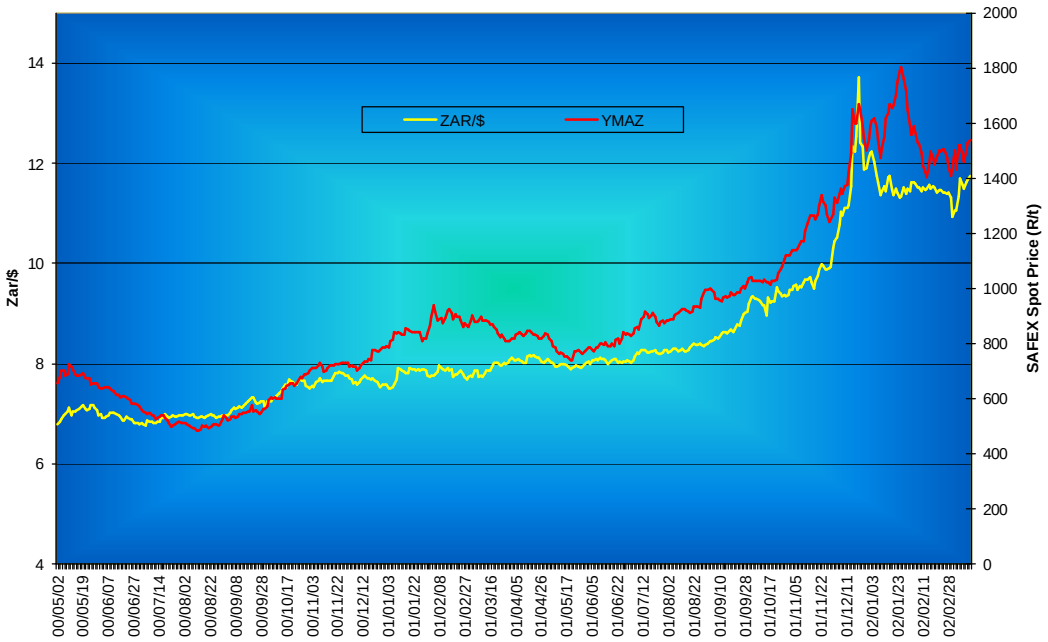
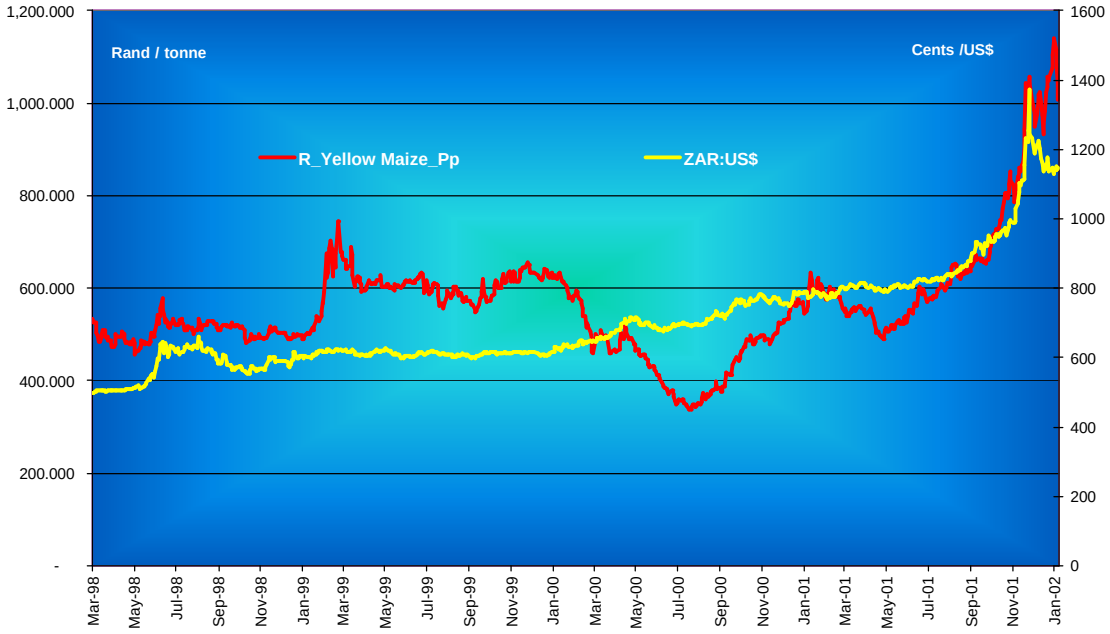


Figure 11: White maize producer price vs. the R/$ exchange rate, 1999 – 2002



Source: SAFEX/AMD and Reuters

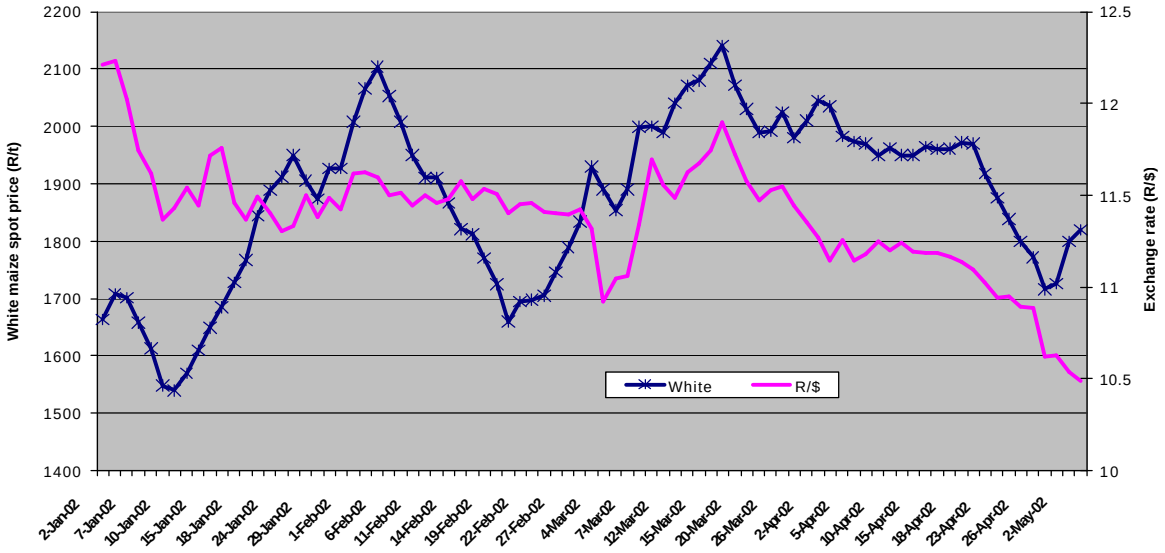
Figure 12: Yellow maize producer price vs. the R/$ exchange rate, May 2000 to March 2002



Source: SAFEX/AMD and Reuters

Figure 13: Yellow maize producer price vs. the R/$ exchange rate, 1998 – Jan 2002

Further evidence that the short-term movements in the spot price for maize are driven largely by the exchange rate is provided in Figure 14, which shows that the post-February improvement in the exchange rate has led to a drop in white maize prices.



Source: SAFEX/AMD and Reuters

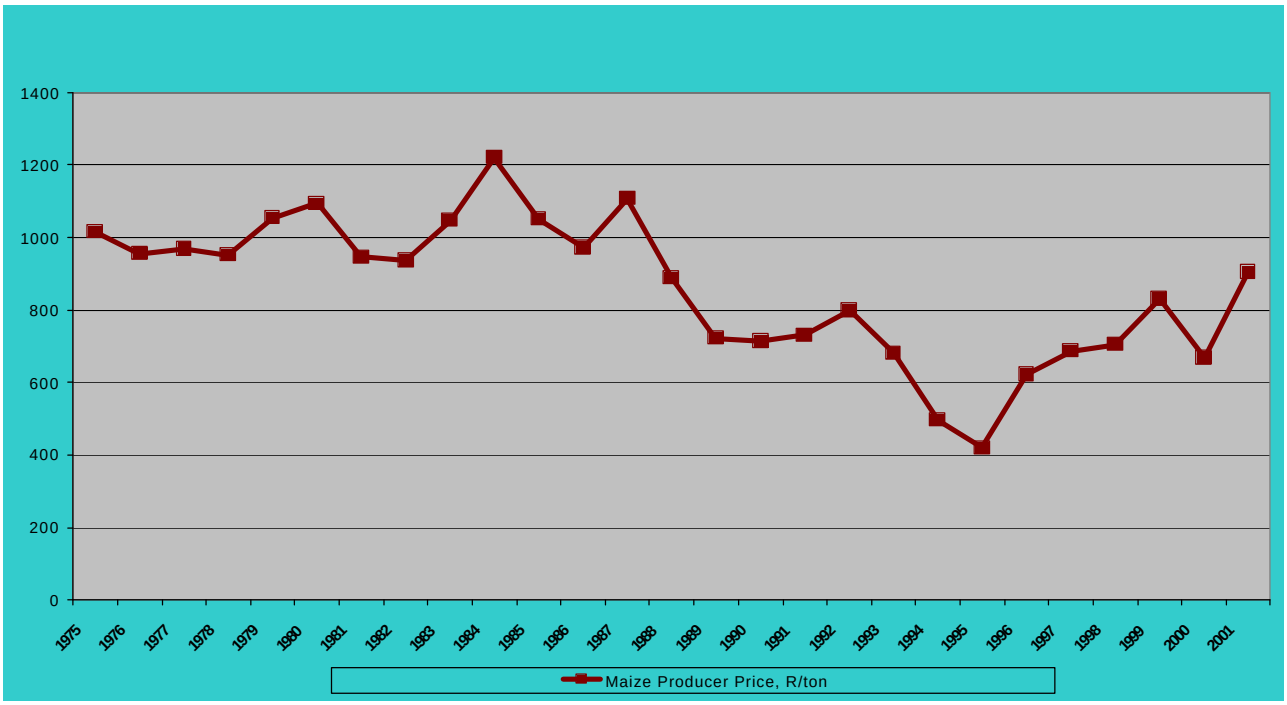
Figure 14: Short term movement in the spot price for white maize, January to May 2002

The discussion thus far has reflected trends in nominal prices, largely to show the correlation between the nominal price and the exchange rate. However, any sensible interpretation requires consideration of the real producer prices. These are shown in Figure 15, which depicts the trend in the annual weighted average for real maize producer prices since 1975. The real farm gate price of maize was more than 40% lower in 1996 than its level in 1975-1985 – declining on average by 7% per annum between 1985 and 1990 and 10% between 1990 and 1995. The introduction of the tariff started a trend of increasing real prices that has continued since, and that accelerated at the end of 2001 with the sharp weakening in the exchange rate (Between 1995 and 2000 real prices increase by 9.7% per annum but since 2000 by 35% per annum on average).

However annual averages distort reality somewhat and when one considers weekly prices we find that it is only since September 2001 that producers could earn more in real terms relative to 1975. This is reflected in the following real weighted average prices:

Box 3

Year	Maize producer price: (R/ton in constant 2000 prices)
1975	R1 016
1984	R1 220
1987	R1 108
1995	R 419
2000	R 668
September 2001	R1 200
January 2002	R2 500



Source: Abstract, 2000 and SAFEX/AMD

Figure 15: Real maize producer prices, 1975 – 2001 (2000 prices)

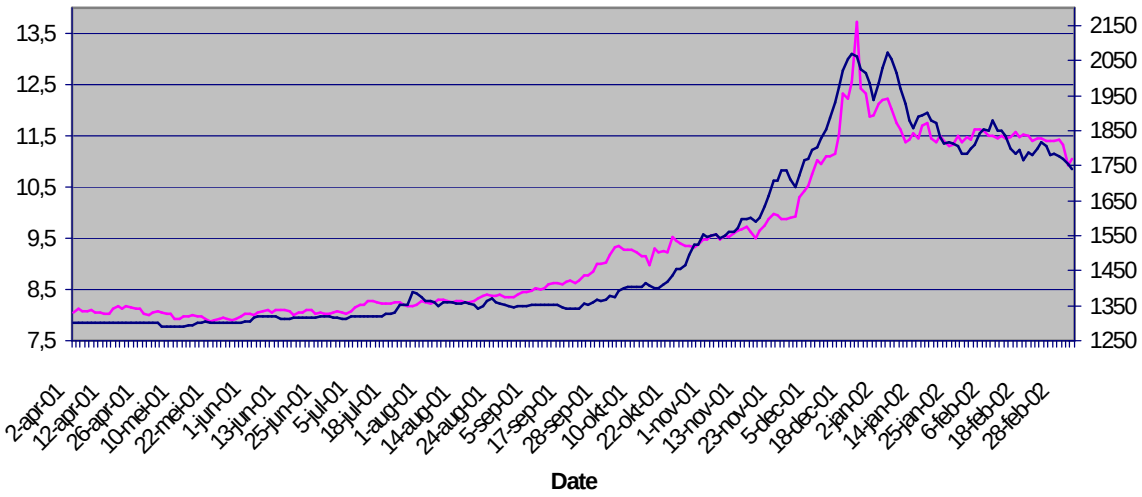
The outlook for the next 2 to 3 seasons in the maize market is driven largely by the situation in southern Africa, the reports of another El Nino weather event likely in the 2002/03 and 2003/04 cropping season plus the fact that a smaller than expected commercial crop will be realised in South Africa. With a major shortage of maize already being reported in the region it is projected that Southern African countries will have to import maize over this period, and that maize prices will thus remain high for the next 2 to 3 seasons. Thus, it is likely that the exchange rate and the world price will drive local maize prices in the near future. It is therefore important to look at the medium term outlook for world maize prices.

An analysis of the recent trends in international grain prices indicates that the maize price usually reaches a minimum of around $95/t during the periods December to March. In some years it actually overshoots the $95/t level depending on climatic conditions of the preceding planting period. Currently the international spot price is at $92/t, which is fairly high for this time of the year. It is therefore expected that for the year ahead until March 2003 the international price is likely to increase by at least $3/t to reach the minimum of $95/t around March. With current weather conditions persisting it may even overshoot $95/t, and the Food and Agricultural Policy Research Institute (FAPRI) at the University of Missouri has already predicted a price of $98/t for the 2002 season, with projections of $101 and $103 for 2003 and 2004. The USDA's baseline projections for US farm prices vary from $82 to $88 per ton for the same seasons. Taking into account the transport differential to the Mexican gulf these projections seem to be more or less on par. Obviously these are only **baseline projections** (i.e. projections given the current situation), which will adjust as world supply and demand factors change. The net effect of these prices on South Africa will obviously depend on the direction of the exchange rate and the crop outlook for SADC for the next 2 seasons.

Wheat

Figure 16 provides an overview of the average trend in wheat producer prices as reflected by the price of the near month wheat contract. Figure 14 shows that the strengthening of the Rand in the past few months has brought about a decline in wheat producer prices, again confirming that the relative movements in the exchange rate have an important influence on producer price trends.

In April 2002 the landed price for wheat in Randfontein was R2103/t (Dollar price of $110.30). The landed price includes a duty of R196/ton, which is equal to 9.3% of the landed price. Given the continuous decline in world wheat prices it is likely that a tariff of R335/ton could be realised in accordance with the import duty formula. This would increase the landed price by 6.7%.



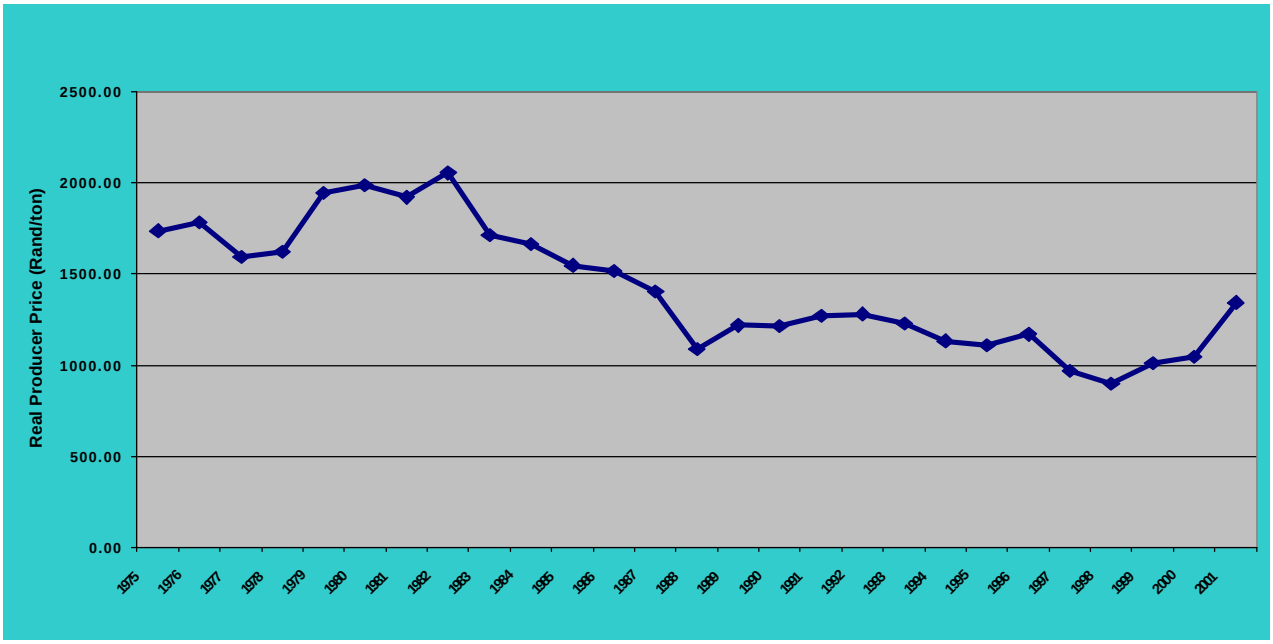
Source: SAFEX/AMD and Reuters

Figure 16: Wheat producer price vs. the R/$ exchange rate, April 2001 to March 2002

The figures above reflect the trends in nominal prices. As in the case of maize, it is also necessary to reflect on trends in the real producer prices of wheat. These are presented in Figure 17 below. These data show that the real price of wheat in South Africa reached an historical low by 1999, when the tariff was introduced. Since then, the annual average real price has continued to increase, but was still considerably lower than its historical highs in 1975 and 1982 until December 2001. The annual averages however hide a number of facts and when weekly prices are analysed we see that it is only since December 2001 that producers have received prices, which were comparable with the price levels in 1982:

Box 4

Year	Wheat producer price: (R/ton in constant 2000 prices)
1975	R1 738
1982	R2 055
1988	R1 085
1995	R1 108
2000	R1 044
December 2001	R2 181
January 2002	R2 157



Source: Abstract, 2000 and SAFEX/AMD

Figure 17: Real wheat producer prices, 1975 – 2001 (constant 2000 prices)

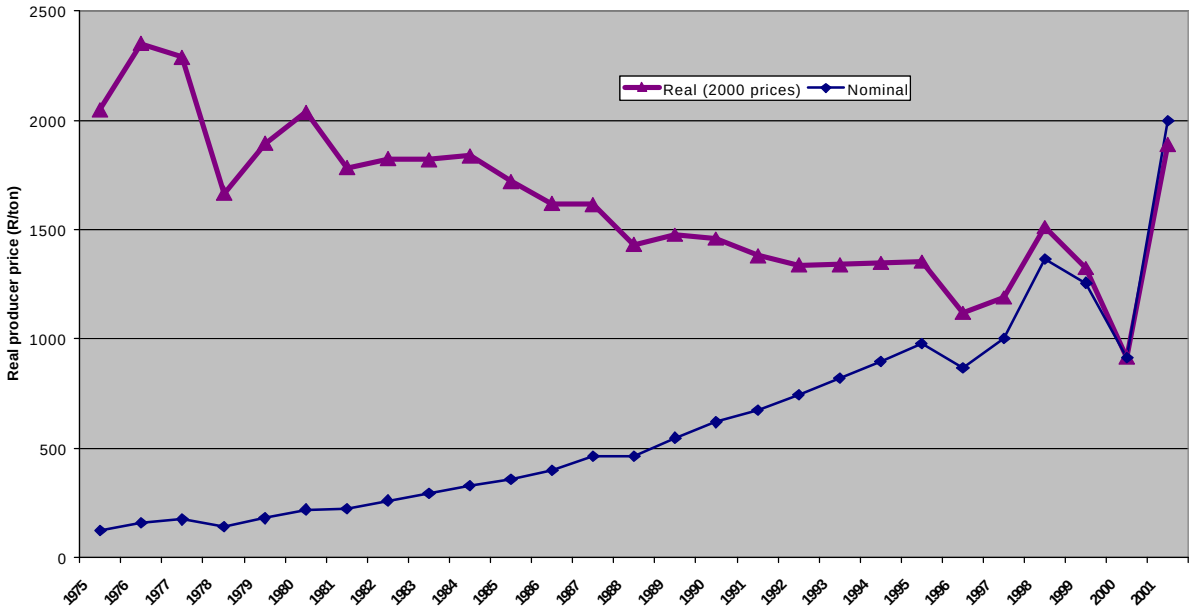
South Africa remains a net importer of wheat, despite a relatively large expected wheat crop of 2.4 million tons for the current production season. Imports of around 300 000t will therefore continue. It is further anticipated that high maize prices and better gross margins in maize will shift land out of wheat production into maize production. In May 2002 the National Crop Estimates committee has already reported a drop in wheat plantings, which could result in a much smaller wheat crop in 2002/03 (around 2,2 million tons) implying that the international wheat price and the exchange rate remain the key factors influencing domestic wheat prices.

The International Grains Council (April 2002) forecast that total world production of wheat would decline marginally, but that exporters' supplies should be more than sufficient to meet importing countries' commercial needs. Mounting evidence of damage from dry weather in winter wheat areas in the United States has, however, led to a reduction of 3.5m tons in the forecast US total crop to 55m tons, only 2m more than last year.

The International Grains Council (April 2002) also forecast world wheat **trade** to be unchanged at 105m tons, 2m less than in 2001/02 when unusually large EU imports boosted the total trade, and by a rise in the feed wheat trade. EU purchases may remain above average if third-country grain is competitively priced. Pacific Asia and North Africa may import larger amounts, but the import needs of the CIS and Near East Asia countries should be lower. China's imports are currently projected at 4m tons, on the assumption that milling wheat inventories might otherwise fall to very low levels. While US exportable supplies may be less than expected earlier, the outlook for renewed large surpluses in the CIS, Europe and South Asia should ensure that global export availabilities remain ample.

The International Grains Council's forecasts for consumption and closing stocks in 2002/03 remain constant at 600 million tons, 4m more than this season. World wheat ending **stocks** are projected at 132m tons, down 4m tons from 2001/02, while stocks in the **five major exporting countries** are forecast to increase by 2m tons to 46m. Stocks in the EU could rise by 5m tons to 19m tons, the highest for 10 years, but a reduction is expected in US carryovers.

In the current season several countries have continued to offer unusually large surpluses of wheat at attractive prices, some taking measures such as reducing internal transportation costs in order to compete more effectively on the international market. Somewhat lower wheat prices, especially the sharp drop in US Soft Red Winter wheat, have triggered buying by a number of key importers, but the overall volume of new business has been relatively subdued. Concerns about northern hemisphere wheat crops, particularly in US Hard Red Winter areas, first increased but subsequently ebbed with the onset of rains, although total US production is unlikely to rise much from 2001.



FAPRI predicts a world wheat price of $133.61 per tonne for 2002 and then $138 in 2003 and $141 in 2004. This is again in line with the USDA baseline projection, which suggests that prices could strengthen from the current low prices to somewhat higher levels, as suggested here.

Sunflower Seed

Although sunflower seed is one of the major oil seeds (the raw material for most cooking oil), it is also one of the main substitute products in the grain producing regions, thus producer prices followed a similar trend to that of wheat and maize (See Figure 18).

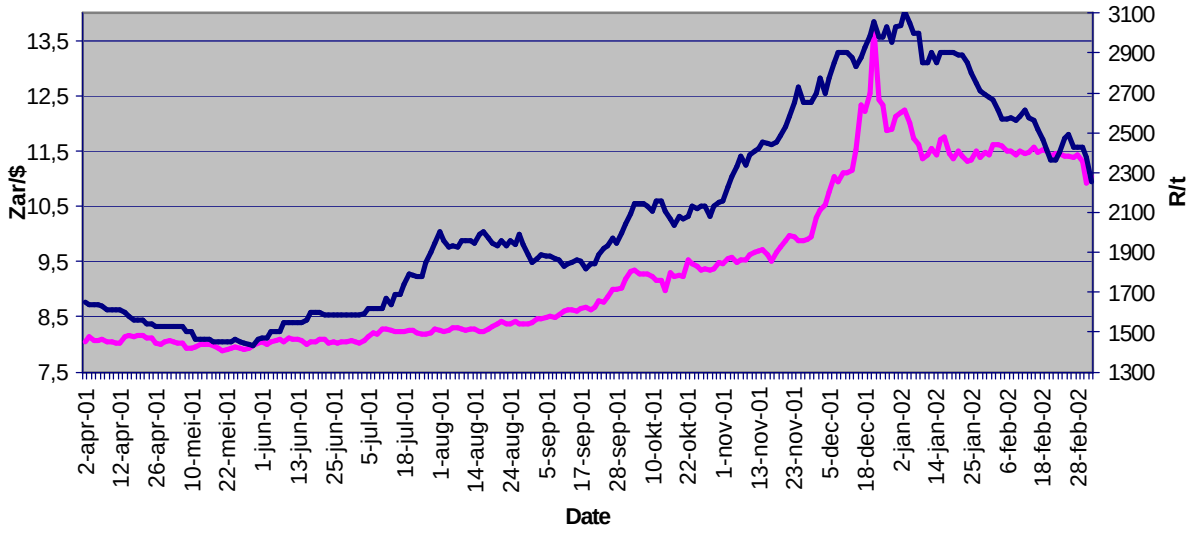
Low world stocks of sunflower oil and delays in planting in Argentina contributed to a sharp rise in prices of sunflower oil on international markets. South African prices have recently tended to move below import parity because of a relatively large domestic crop. The depreciation in the exchange rate has nevertheless had a similar effect on producer prices, as has been the case for maize and wheat. This is shown in Figure 18. In Figure 19 the trends in the real producer price are shown. It is again evident that the real producer price has returned to the levels of a decade and more ago with the recent weakening of the exchange rate.

Source: SAFEX/AMD

Figure 18: Sunflower seed producer prices vs. the R/$ exchange rate, April 2001 to March 2002

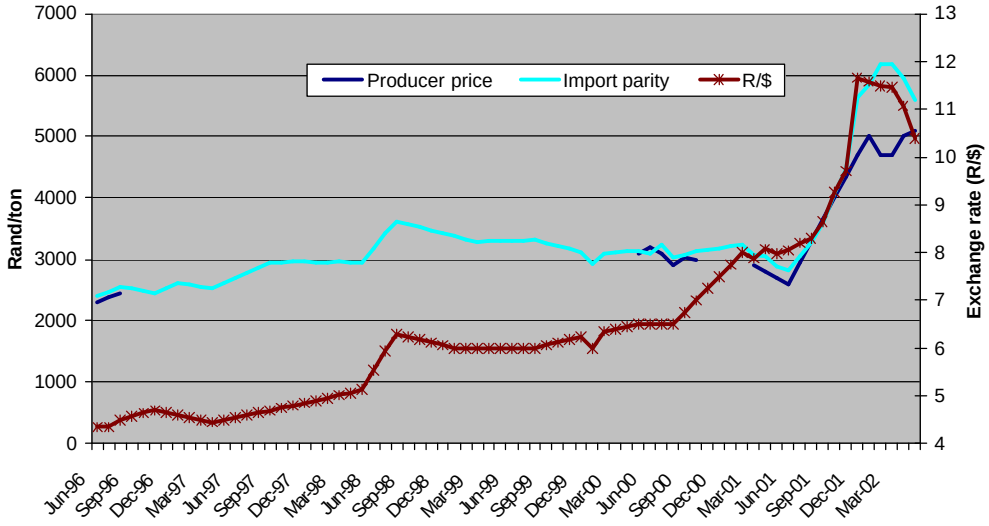
Source: SAFEX/AMD

Figure 19*:* Real sunflower seed producer prices, 1975 – 2001 (2000 prices)



Dry beans

Since 1993 South Africa has imported between 40 000 and 60 000 tons of dry beans annually, a substantial increase on previous years. This could be a direct result of the abolition of marketing controls in the dry bean industry in 1993. Since then producer prices have also more or less followed import parity prices, as shown in Figure 20 below. Locally produced dry beans have been selling at a discount to imported prices, where the discount was as high as 23% in Feb 2002 but dropped to 8% in May 2002. As data on dry bean producer prices are only available for the last 15 months, it is not possible to show real price trends. However, the available information shows that real producer prices for red-speckled beans were 44% higher in May 2002 than in May 1998. From March 2001 real producer prices increased on average by 48% per annum or 3.3% per month over the 15-month period up to May 2002

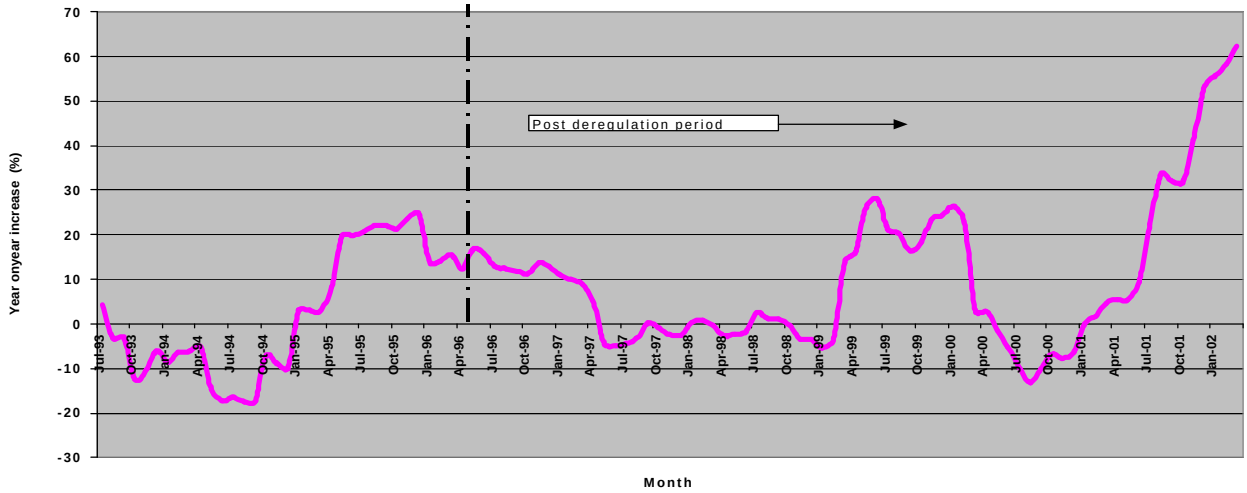


Source: Dry bean producer organisation, 2002

Figure 20: Producer prices and import parity for red-speckled dry-beans, 1996 – 2002

PPI for grain products

Figure 21 below provides an overview of the year on year increase in the producer price index (PPI) for grain products since July 1993, showing the seasonal nature of the trends. Nevertheless, the rapid increase of 63% between March 2001 and March 2002 is the most striking feature of this trend, which has largely been the result of the weakening in the exchange rate.



Source: Calculated from STATSSA PPI time series

Figure 21: The annual increase in the PPI for grain products: July 1993 – March 2002

2.4.2 Dairy products

A comprehensive discussion of a specific industry is used here to illustrate how industry structure can influence price behaviour, and thus the general trend in food prices. The dairy industry is a large and complex industry, and provides an ideal case study to unpack the structural factors that could influence food prices.

The primary industry is undergoing a number of structural changes at present. The total number of commercial milk producers in South Africa has been declining (see Table 16), there has been a reorganisation of milk production between the coastal and inland areas of the country (see Table 17), and the balance between small and large producers has shifted (see Table 18).

As is the case in most agricultural activities, producers range from a small number of large commercial farms using the most modern production technology and industrial management systems to an amazingly large number of smaller farms using more rudimentary technology. The South African dairy industry is, however, in the process of structural change that is reminiscent of the changes taking place in other industrialised agricultural economies such as the USA, Australia and New Zealand. The most important manifestation of this 'industrialisation' process is the decline in the number of smaller producers along with a decline in their share of production. The data are shown in Table 18. The number of small producers (those delivering less than 1000 litres of milk per day) declined from 79% of the total number of producers in 1995 to 62% in 2001, while their share in total production declined by more than half, from 39% to 18% over the same period.

Table 16: Number of commercial milk producers per province, 1997 and 2001

	December 1997	December 2001	% change
Western Cape	1577	1088	-31
Eastern Cape	717	514	-28
KwaZulu-Natal	648	446	-31
Northern Cape	133	73	-45
Free State	1204	1360	+13
Northwest	1502	987	-34
Gauteng	356	279	-22
Mpumalanga	866	537	-38

Northern Province	74	63	-15
Coastal areas	2942	2048	-30
Inland areas	4135	3299	-20
Total	**7077**	**5347**	**-24**

Source: Milk Board 1995 and MPO 2002

Table 17: Geographical distribution of milk production per province, 1994 – 2001

Province	**Production**			
	1994 %	**1995 %**	**1998 %**	**2001 %**
Western Cape	23,1	22,9	25,1	24,3
Eastern Cape	10,0	13,8	14,3	20,1
KwaZulu-Natal	7,7	15,7	18,9	17,5
Free State	24,2	18,0	16,3	13,6
Northwest	18,4	12,6	12,5	10,6
Mpumalanga	10,2	11,0	7,5	9,3
Gauteng	3,8	4,4	4,4	3,5
Northern Cape	1,6	1,2	0,7	0,8
Northern Province	0,9	0,4	0,3	0,3
Coastal areas	40,8	52,4	58,3	61,9
Inland areas	59,2	47,6	41,7	38,1
Total	**100,0**	**100,0**	**100,0**	**100,0**

Source: Milk Board 1995 and MPO 2002

The coastal regions of KwaZulu-Natal and the Western and Eastern Cape are more suitable for low cost milk production systems on natural and irrigated pastures, and are closer to imported animal feeds. This is reflected in the shift in production to the coastal provinces (Table 18), and probably a faster reorganisation into larger production units in these areas. Another important benefit from this shift is the savings in transport costs, an important variable in the dairy industry. The data in Table 19 show the density of milk production per square kilometre in different parts of the world, and in the interior and coastal regions of South Africa. The 'density' of milk production in the coastal areas of South Africa, while still low, compares more favourably with other parts of the world than does that of the inland areas.

Table 18: Size distribution of milk producers, 1995 and 2001

Daily production (Litre/day)	**Percentage of producers**		**Percentage of production**	
	1995	**2001**	**1995**	**2001**
<500	58	45	19	9
501 – 1000	21	17	20	9
1001 – 2000	13	17	24	19
2001 – 4000	6	11	22	24
4001 – 6000	2	5	5	15
> 6000	0	5	10	24

Source: MPO estimates

Structural changes are also occurring in the processing industry responsible for the manufacturing of dairy products. In the aftermath of deregulation there has been a marked increase in the number of small milk distributors (producer-distributors or PDs) using non-traditional distribution channels, including bulk milk tanks in greengrocers, butcheries, bakeries, etc., at volumes and qualities, that are difficult to estimate.

Table 19: International comparison of milk production per km² per day

Country	**Litres/km^2 per day**
France	125
Germany	308
Netherlands	892
UK	257
New Zealand	94
South Africa:	5
-Interior areas	25
-Coastal area 1	103
-Coastal area 2	96

Source: Hermann, 1997

At the end of 1997 milk was bought and processed by some 350 milk processors and manufacturers in South Africa (Table 20). Apart from regular processors and manufacturers, approximately 522 producer distributors (PD's) were actively involved in the marketing of liquid milk and fresh dairy products. There is a general perception in the industry that the number of PD's grew substantially after deregulation, while the volume of milk processed by medium sized processors increased both nominally and relatively[14].

Table 20: The number of buyers and producer-distributors registered with the Milk Board, 1997

Province	Milk buyers		Producer-distributors	
	Number	%	Number	%
Western Cape	42	12	59	11
Eastern Cape	29	8	62	13
Northern Cape	9	3	33	6
KwaZulu-Natal	29	8	72	14
Free State	39	11	75	15
North West	32	9	49	9
Gauteng	122	35	64	12
Mpumalanga	37	11	64	12
Northern Province	10	3	44	8
Total	**349**	**100**	**522**	**100**

Source: Milk Board

Approximately 88% of processors and producer-distributors account approximately for 3,5% of total milk processed. These processors are mainly small entrepreneurs involved in processing liquid milk and to some extent fresh dairy products in rural areas. Individually they process less than 2 000 litres milk per day. The Agricultural Research Council (Keller, 1999) and Agrelek (1998) are prominent in supporting small dairy processors.

The four largest dairy companies process between 74% and 78% of total commercial milk delivered to dairies (Theron J, SA Dairy Foundation, March 2000). Competition Commission South Africa's (CCSA) 1993 and 1996 calculations support Theron's figures (see Table 8). The CR4 and CR10 values calculated for 96 and 113 dairy product firms have decreased from 0,76 to 0,68 (CR4) and from 0,89 to 0,80 (CR10), and the HHI from 1763 to 1598. All these concentration indicators are less than their critical levels and decreasing. This runs counter to international trends in the dairy industry, where fewer and larger firms are responsible for the manufacture of dairy products (Baas *et al*: 1998). The decreasing values of the concentration indices in the RSA are indicative of increasing competition in the dairy processing industry.

While the structure of the dairy products processing industry is changing, and becoming more competitive, it remains oligopolistic, given the relatively large market share of the largest 4 firms, while there is little evidence that it has become more efficient (Scorey, 1999). In this latter respect, the National Productivity Institute (NPI) has noted that 'Without exception …the assignments confirmed that the scope of opportunity was large for improving the productivity of all resources (capital, labour, equipment)' (Scorey D, 1999). This is supported by the size of this industry's multifactor productivity (MFP)[15], which was 0,81 (CCSA, 1993). Based on this information, the productivity of the dairy processing industry is not conducive to narrowing the gap between the farm gate and consumer price.

Thus, the scene is set for intense competition in the primary and secondary dairy industry. At the top of the log are a few equally balanced competitors. Rivalry among existing competitors takes the familiar form of jockeying for position,

[14] Exact numbers are not known, as the participants are no longer compelled to register.

[15] The size of MFP values indicates the change in output that cannot be explained by the change in factor inputs. A MFP value less than unitary is interpreted as a decline in productivity.

using tactics such as price competition, advertising, new product introductions and increased customer service or warranties (e.g. 'use by' dates). In the short run consumers might benefit from such competition, but over the long run companies will recoup 'losses' by increasing wholesale prices or offering primary producers less if they can gain market power. Both these actions broaden the gap between producer and retail prices.

An interesting aspect of the dairy industry has been shifting rivalry following deregulation when a large well established Italian dairy company Parmalat entered the South African Dairy industry at high cost and fierce rivalry. The immediate effect of Parmalat's entrance was an intensification of competition by way of a price war in cheese and butter from beginning 1998, lasting until the first quarter of 2000. The sharp, exponential increase in consumer prices since March 2000 (discussed in Section 2.5) can be to recoup "losses" encountered during the battle for market share and position. During this same period the real producer prices at first dropped sharply (-28%) and then increased on average by 1% per year to stagnate from January 2001.

Parmalat has a leading research system and has available technology and products "from the shelf". As such it is stepping up competition with a wide variety of products, appealing to young and old but with relation to South African consumer and market conditions, it is on a strong learning curve. Mediums sized dairy processors, knowledgeable of such conditions and with excellent products are at present growing their market share via strong competition and at the cost of all large dairy processors.

In the long run large dairy companies might revert to their standard tactic of growing market share in a slow growing national market by buying out medium sized processors well established in niche markets. This option is unlikely as the dairy market and companies are at present under financial duress. The long-term effect of Parmalat's entrance can be that competition will move from intense to less intense price battles, with more focus on novel and quality dairy products. Medium sized dairy processors will endeavour to firm their position in their immediate market domain, expanding slowly into other areas, as high transport cost is a negative growth factor for large and small firms.

Price trends

There is no uniform payment system on which producer price of milk is based. The inclusion of for instance butterfat and protein in the payment system depends on the type of milk buyer. A milk buyer who processes butter and cheese will include butterfat and protein in the price they offer, while a buyer that processes and distributes fresh milk is only interested in milk volume.

The disadvantage is that market signals are not clearly transmitted. The effect can be illustrated by the reaction of producers to an attempt by processors to enlarge their share in the raw milk market during 1996 – 1997, in the aftermath of milk shortages in '95 and '96. Processors offered dairy farmers high prices, which resulted predictably in a large milk surplus in 1998. However, the result of such actions could be short-term gain at the expense of longer-term stability. The expansion of dairy herds, depending on the production elasticity, or an increase in milk production, as during 1998 – 1999, usually end up in a decline in raw milk demand and, as from 1999, a slower increase in producer prices.

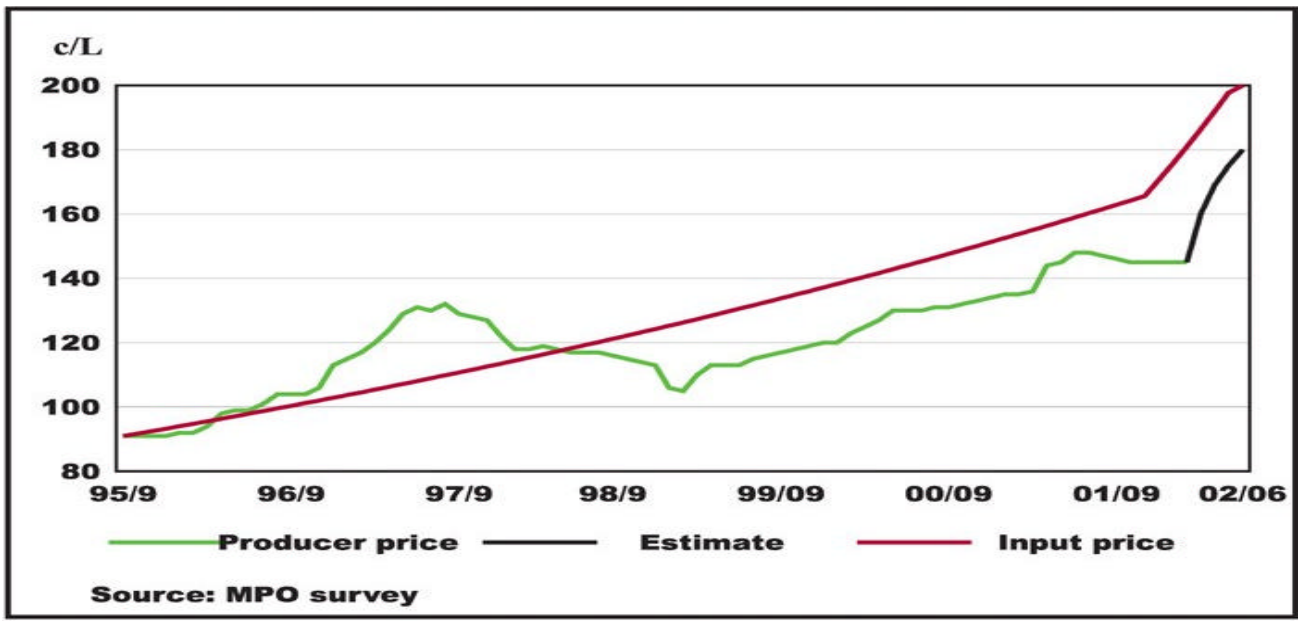
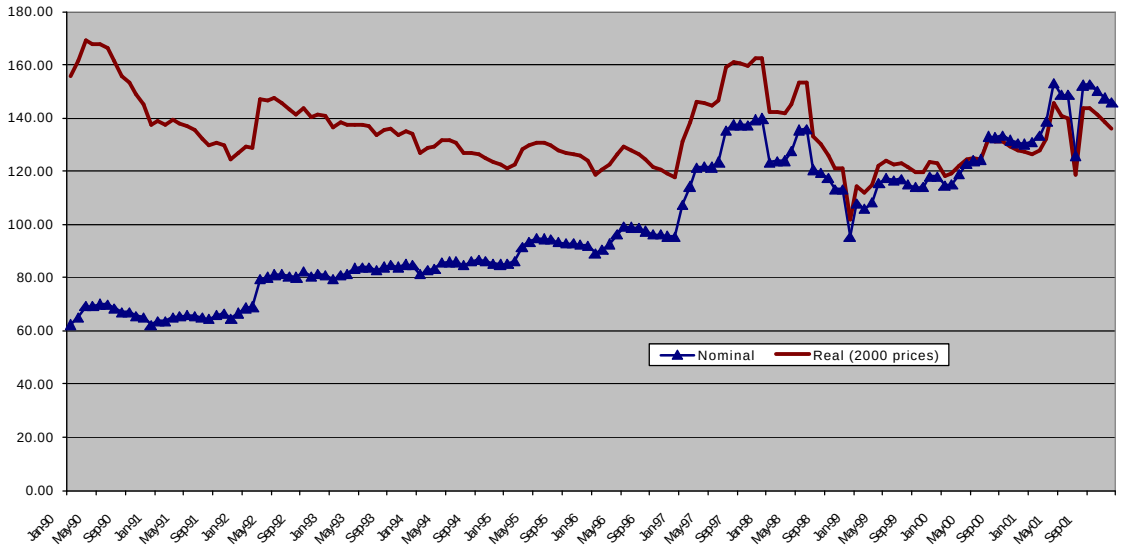


Figure 22: Monthly average producer and input prices for milk, 1995 – 2002

At the macro level, commercial producers' direct input cost in 1998 was estimated at R2 194m, and investment in infrastructure at R7 360m, to produce a raw milk volume of 2 620m litres which was sold for R3 405m (SAMFED, 2000). In general monthly average milk producer prices increased from September '95 until September '97. The post '97 downswing was arrested early in '99 and since then it has been on a slow upward trend (Figure 22), although the real price has been relatively stable, falling between R1.20 and R1.60 for most of the past 10 years (Figure 23). The price of farm requisites increased steadily at nearly 10% per year over the period September 1995 to July 2001. Since then, the weakening of the Rand has resulted in an accelerated increase in input prices (MPO, 2002). Due to increasing input costs and a decrease in annual milk production (Figure 24) there remains some doubt about the international comparative position of the industry.



Source: Calculated from MPO statistics

Figure 23: Real producer price for fresh milk (2000 prices), 1990 – 2001

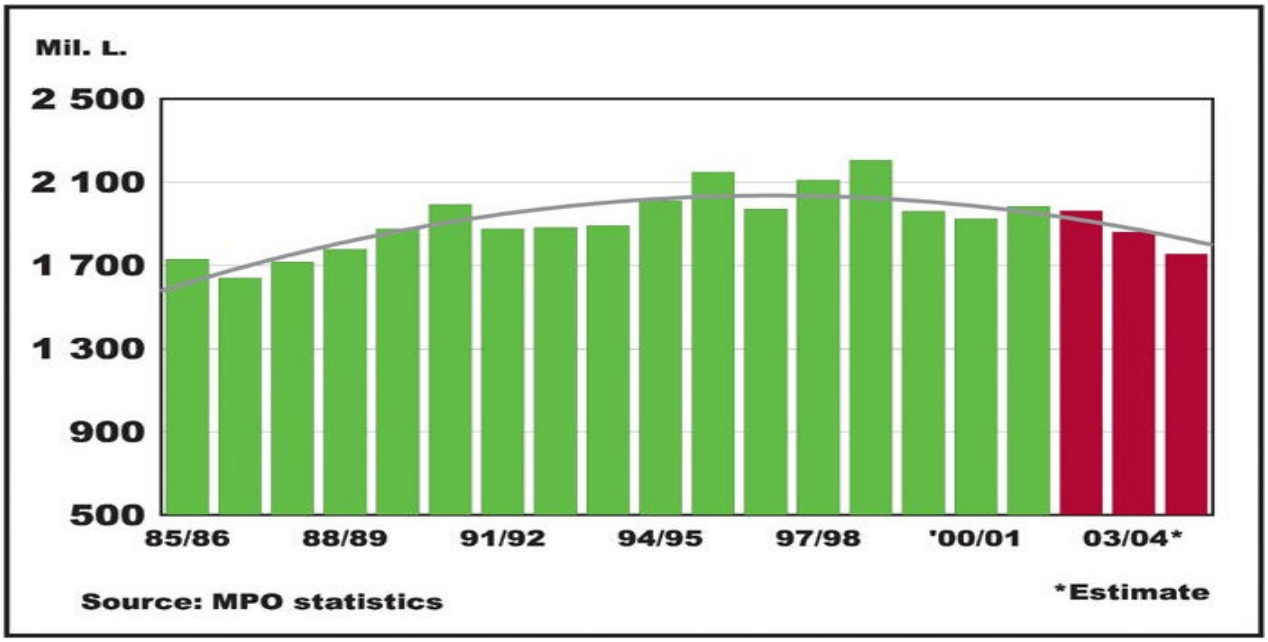


Figure 24: Annual milk production, 1983/84 – 2003/2004

2.4.3 Red meat[16]

The red meat industry is one of the most important in the agricultural sector, and contributed 12.7% to the gross value of agricultural production during 2000/01. In this section the broad trends in producer prices for beef cattle and mutton are presented. Market prices for red meat are determined through the interaction between supply and demand at various auctions, with factors such as the quantity of imports and the 40% tariff on imported meat influencing the level of prices.

Beef

South Africa has traditionally been a net importer of beef, mainly (duty free) from Botswana and Namibia, and is expected to remain an importer for the foreseeable future. Imports will, however, become more expensive due to higher world market prices as well as the exchange rate effect. This, coupled with problems in controlling animal diseases in a number of exporting countries, will lead to a lower import demand in South Africa, supporting higher domestic producer prices for some time in the future.

Commercial slaughtering volumes and production costs also influence domestic producer prices for beef cattle. Slaughtering volumes have been increasing over the last few years, from 1 750 000 in 1998 to 1 907 785 in 1999 and 1 927 357 in 2000. Further increases in slaughtering volumes are expected in 2002, but this will largely compensate for lower import volumes. With a large proportion of beef slaughtering originating from feedlots, which are vertically integrated, it is possible for costs to be passed through the supply chain to retailers. Because yellow maize and imported oil cake are the major components of animal feed, it is logical to expect higher maize and oil cake prices to also be transmitted through to higher beef prices. In a sense this is already happening, with the price of Class A beef increasing from an average of R10.08/kg in 2001 to R12.35 in April 2002. The import parity price for beef in April 2002 was quoted at R18.95 (Agrimark Consultants), indicating that domestic producer prices are still below import parity levels. Margins in the feedlot industry will, however, come under tremendous pressure as the full effect of the higher grain prices is felt. This is illustrated by the declining meat price/maize price ratio shown in Figure 25 below. The number of kilograms of maize that a kg of beef could buy declined from 26 in 2000 to 9.3 in March 2002.

[16] These data should be interpreted with caution, as it is notoriously difficult to estimate the amount of red meat sold in the informal market in South Africa, and hence the prices paid. Estimates of the proportion of informal sector sales range as high as 50% of industry turnover.

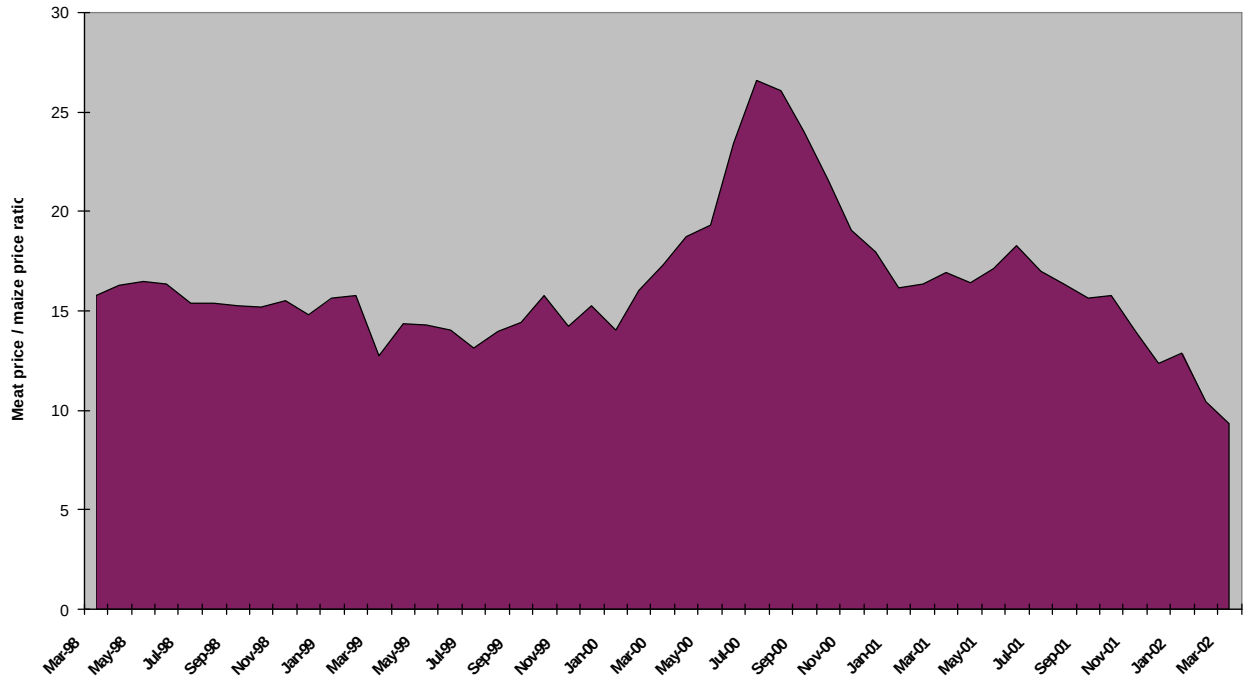
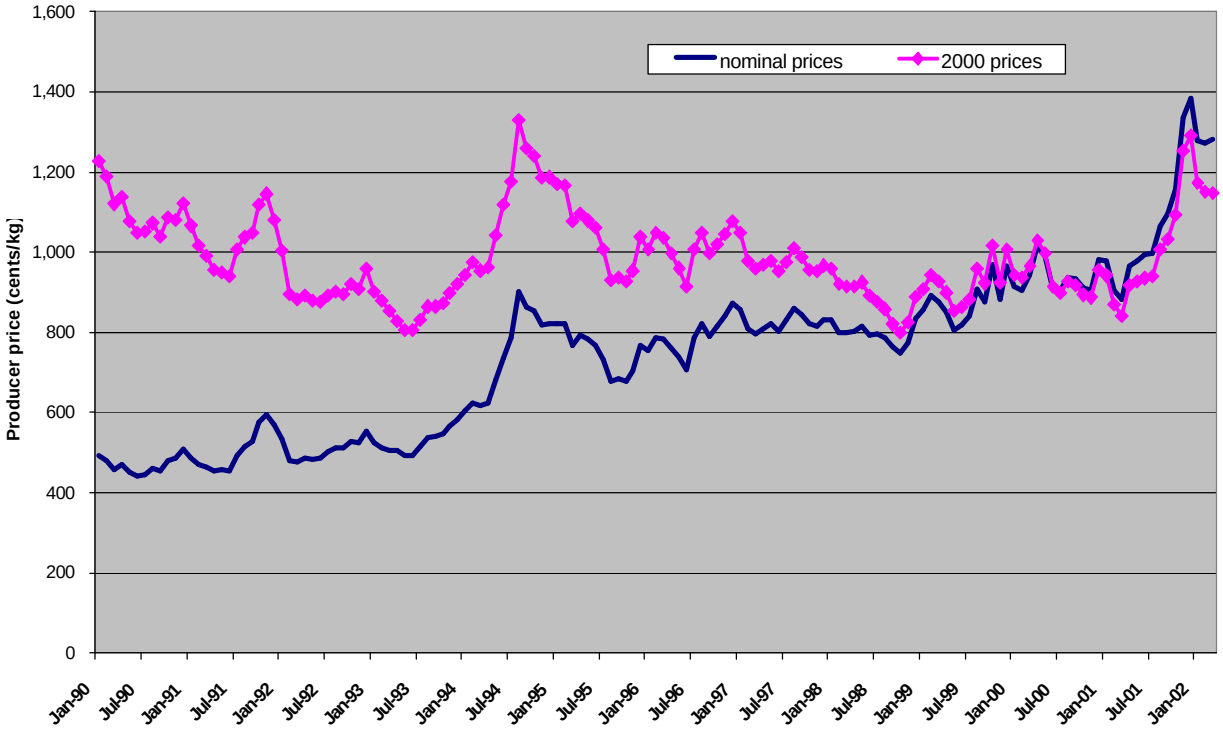


Figure 25: The relative price of maize and beef, 1998-2002

The trends in the nominal and real monthly prices for class A beef for the period 1990 to March 2002 are reflected in Figure 26. Producer prices have been declining in real terms since July 1994, and it is only since July 2001 that a sharp increase in real terms was experienced, with real beef prices reaching the level of 1994 in January this year. This trend is confirmed by data on the growth rates in real producer prices shown in Table 21. The only period in the past decade where real growth in producer prices was positive has been in 2001/02.

Table 21: Average annual growth in real producer prices for beef, 1990-2002

Period	Growth rate (%)	Year	Average real producer price (2000 prices)
1990 - 1995	-3.31	**1990**	R11.04/kg
1996 - 2000	-1.01	**1996**	R10.12/kg
2001 - 2002	6.04	**2001**	R10.03/kg



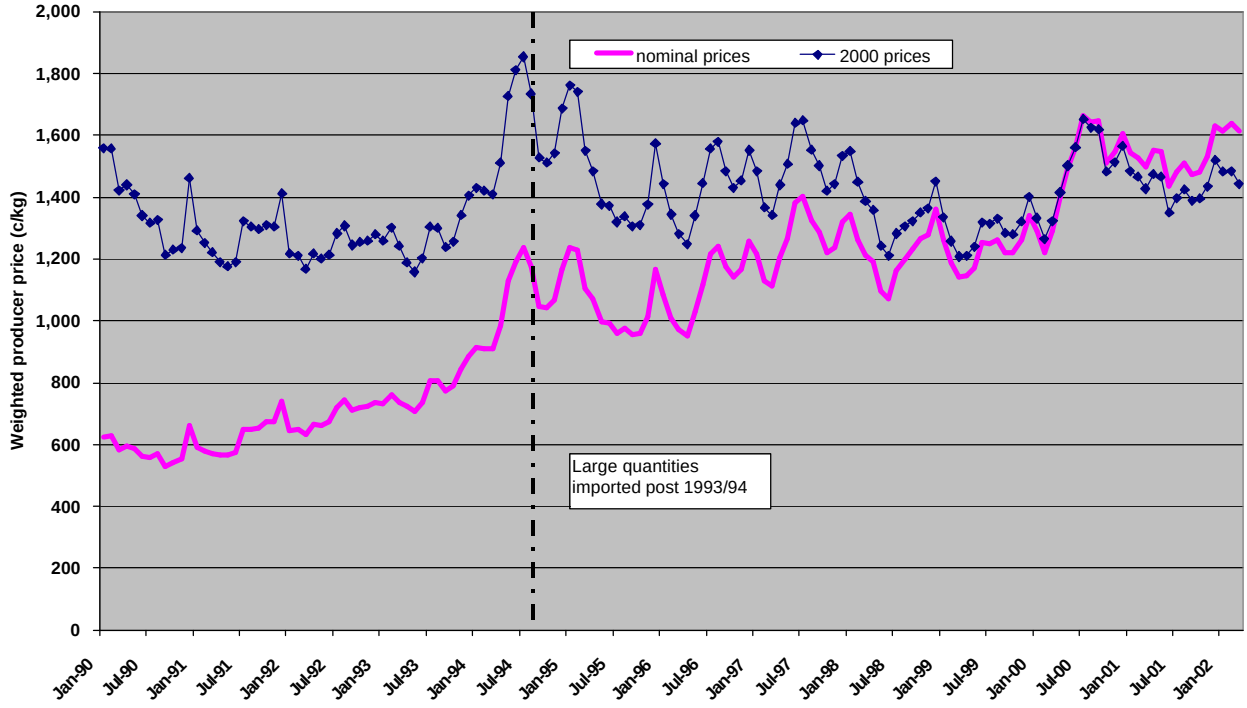
Source: Calculated from data provided by AgriSA/Samic

Figure 26: Nominal and real weighted average producer prices for beef, 1990 – 2002

Mutton and lamb

Sheep numbers in South Africa have declined rapidly since 1992, partly as a result of the increase in stock theft, where sheep farmers have been particularly hard hit, while sheep farmers had to compete with cheap imports of Australian mutton in the aftermath of the first steps of deregulation. As a result, the supply of animals for slaughtering has declined from 8 million to around 4.5 million between 1992 and 2001 (Agrimark consultants, 2002), while imports increased from virtually zero in 1991 to a high of 50 000 tons in 2000 (Agrimark consultants, 2000). This kept domestic producer prices low. Figure 27 below shows how real producer prices declined following the increased imports. For most of the period 1994 to 2001, real producer prices for were below the levels of the early 1990s, and have only recovered in late 2000 as a result of high prices in Australia and the declining exchange rate.

Since 2000/01, Australian meat prices increased by around 93% and the Rand lost 30% of its value against the Australian dollar. These changes saw the import parity prices of imported sheep meat from Australia rising from an average of R23.83/kg in early 2001 to R40.19/kg in April 2002. This resulted in an immediate drop in imports and an increase in domestic producer prices, where the price of Class A meat increased from R15.09/kg to R18.00/kg over the same period. Agrimark consultants (2002) predict a producer price for class A in October 2002 of R18.28.



Source: Calculated from data provided by AgriSA/Samic

Figure 27: Nominal and real producer prices for mutton and lamb, 1990 – 2002

Few mutton and lamb producers rely on maize and grains for feeding, thus it is safe to assume that this market is mainly influenced by normal seasonal and cyclical factors. The seasonal demand over the Christmas season is clearly visible throughout the trend, with the normal drop in prices during January to March that contributed to the negative growth in real prices over the last 15 months.

2.4.4 Poultry

The poultry industry consists of three main branches, namely the day-old chick supply industry, the broiler industry and the egg industry. In the broiler industry a small number of producers (less than ten) is responsible for approximately 77% of total broiler production in South Africa. Many small production units and the informal sector are responsible for the remaining 23%. The number of broilers slaughtered by commercial producers during the 12 months up to 30 June 2001 is estimated at 523 million. These industries generate output to the value of R6bn annually and are the single most important contributor to the value of agricultural production in South Africa.

The broiler industry has undergone a number of phases of structural change. The first phase can be described as a movement away from a luxury Sunday afternoon product to a general everyday affordable meal. The industry could buy technology at affordable prices overseas and it developed into a high-tech high-capital intensive and vertically integrated industry producing low cost, high quality protein. Although the industry started revolutionising during the sixties, its rapid growth since 1980 is evident from Figure 28.

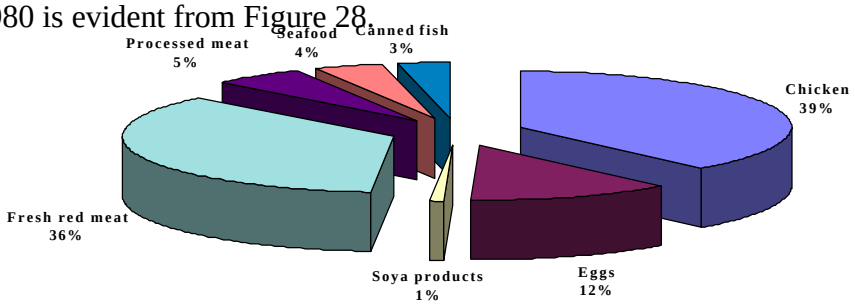
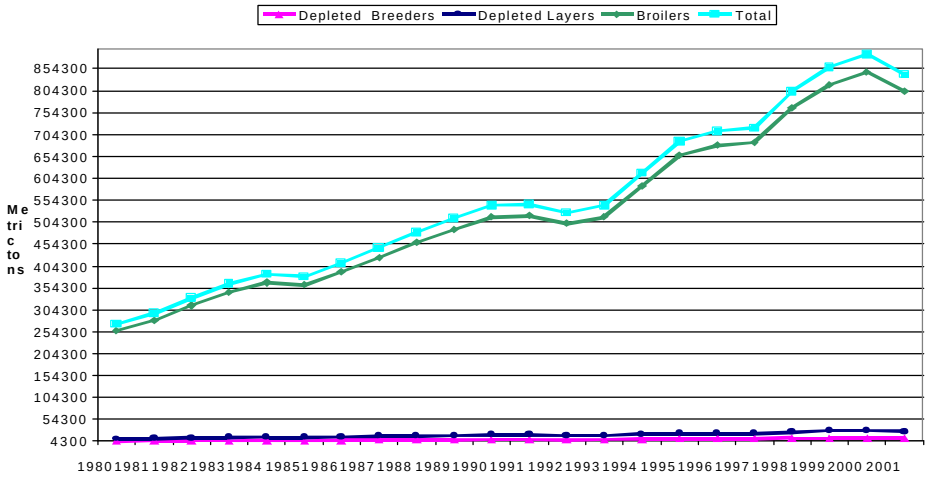


Figure 28: Broiler production, 1980 – 2001

The second phase was more in the marketing field when it challenged the red meat industry for a larger share of the consumer's food budget. The main broiler feed ingredients, namely maize and fishmeal, were relatively cheap and easily obtainable in South Africa. The broiler industry followed a strategy of passing the benefits of technology development to consumers, ensuring an affordable product at competitive prices. For example the time taken to produce a broiler of specified slaughter weight has decreased from 84 days in 1950 to 36 days in 1999. Such progress contributed to a 5% annual growth in world production and price decrease of 4% annually from 1990 to 2000 (M^{c} Guigan and Nieuwoudt, 2002). The result is that by 2000 poultry captured 38,4% of the protein market (BMI Foodpack, 2002) and per capita consumption of white meat increased to roughly 28kg per capita against 20kg per capita for red meat (Abstract, 2000).

Figure 29: Contribution to the total protein market (2 105 844 ton) in South Africa, 2000



The broiler industry involves activities from the parent stock, through the climatically and disease controlled houses to the abattoirs and packing plants in a capital intensive industry that must concentrate on high hygiene standards. From the moment packaging of broilers and the different cuts, e.g. wings, thighs, etc starts, the cold chain must be maintained throughout the process into retail outlets. The high perishability of broilers requires high retail turnover. Chicken portions are easily marinated or spiced during the pre-packing stage and can also be cooked in-house in retail outlets. It is thus part of the fast food emporium. This is an on-going trend and it is expected that the farmer's share of the consumer rand will decline over time (Figure 30).

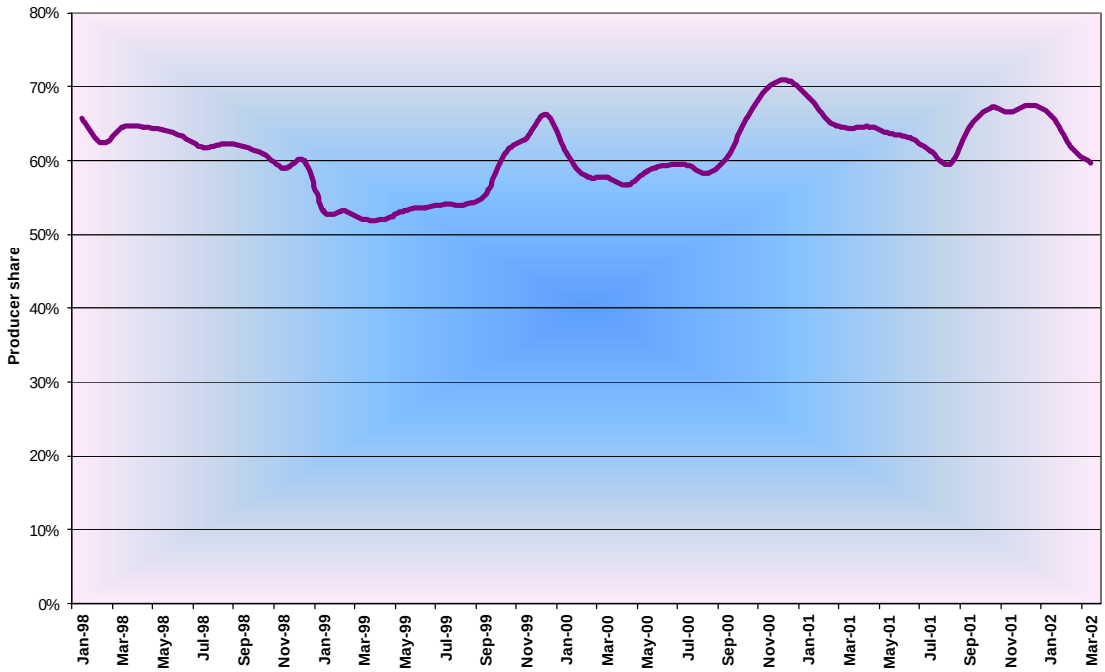


Figure 30: Producer's share in consumer rand for broilers, Jan 1998 to March 2002.

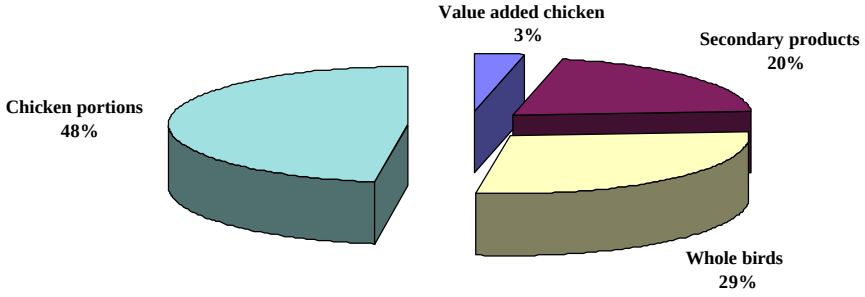


Figure 31: Breakdown of different broiler end-products (807 967 ton) for 2000

The broiler industry was never subject to statutory control under the Marketing Act, but was protected from imports by quantitative import controls. These were abandoned as an industry initiative in January 1988, and replaced by a tariff on prepared or preserved chicken.

A charge of dumping of chicken meat was investigated by the BTT for the period 1 August 1998 to 31 July 1999 as a result of a complaint by the South African Poultry Association. As a result, frozen chicken cuts and prepared or preserved chicken meat imported from the USA became subject to anti-dumping duties, which were imposed with retrospective effect from 5 July 2000 when the provisional payment was imposed. The definitive anti-dumping duties were imposed on 22 December 2000.

The decline in real producer prices of broilers by an average of 17% between January 1998 and August 1999 can largely be attributed to the dumping activities. During the same period real retail prices decreased by only 7.4% per annum on average. The provisional anti dumping payments started retrospectively on 5 July 2000 and contributed to higher producer and consumer prices. Real retail prices have increased by 9,2% per annum since July 2000 and real producer prices by 9.11%. The aggregate marketing margin (Figure 32) remained largely constant.

One must however be careful when interpreting the data as the broiler industry is very much supply and demand driven and has an 18-month lead-time[17].

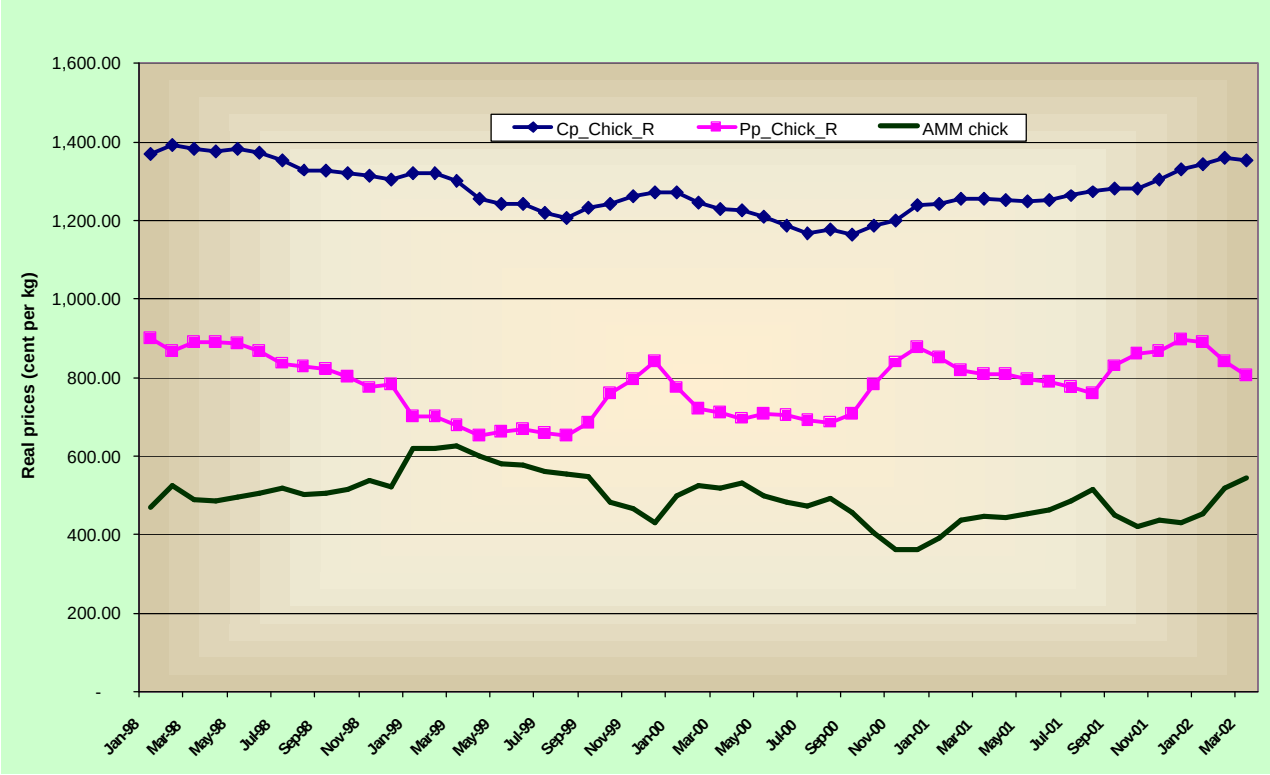


Figure 32: Real consumer and producer prices of poultry in c/kg, January 1998 – March 2002

Eggs

The South African egg industry has experienced realignment with regard to the average size of production units over the past decades. In 1975 75,4% of egg producers had flock sizes less than 30 000 hens. By 1995 the two largest corporate producers and two co-operatives were responsible for marketing 63% of all eggs sold in South Africa.

The egg industry is to a large extent subject to the same production and market peculiarities as the broiler industry. Both have long lead times, and the products are highly perishable, factors that make producers particularly sensitive to changes in supply and demand conditions.

Most eggs (56,6%) in South Africa are sold through retail outlets, while distributors/wholesalers take nearly 36% (Figure 33).

[17] Lead time is the time from the decision to expand is taken until the broiler is ready to be marketed.

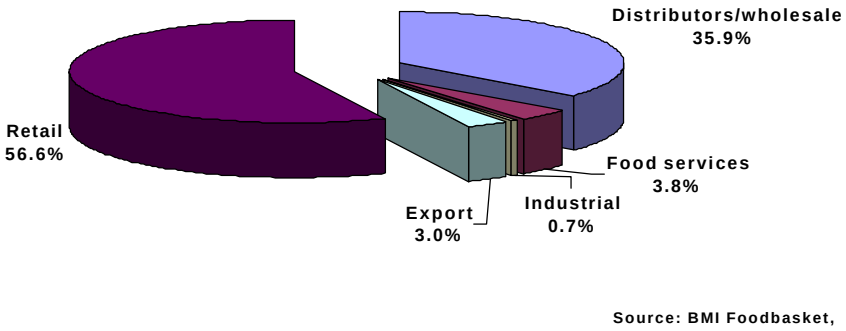
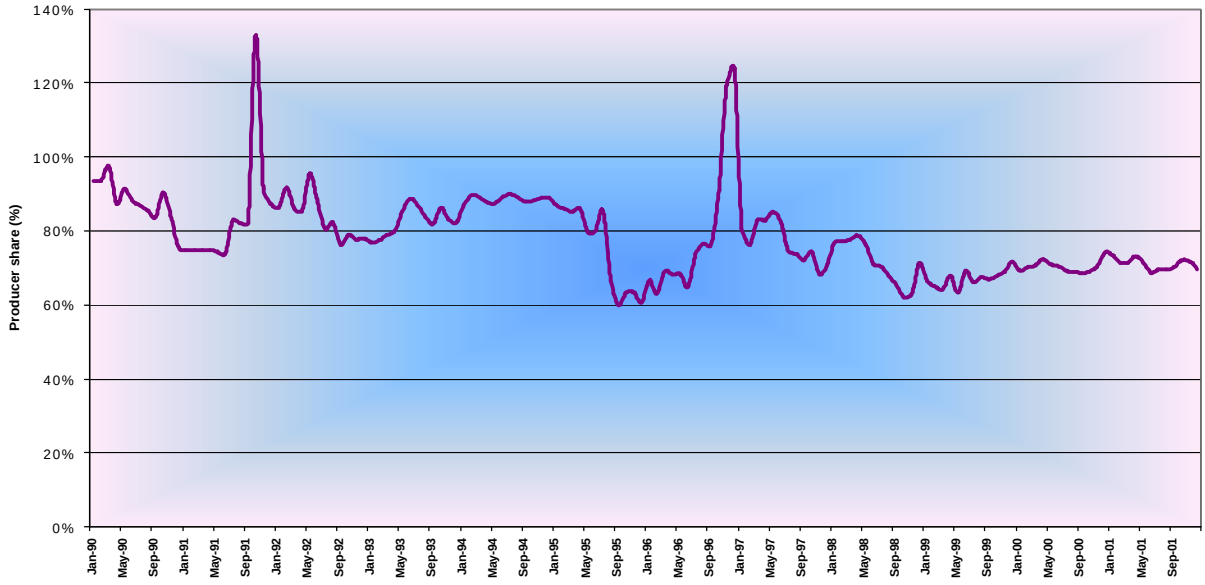


Figure 33: Fresh egg consumption (428 050 000 dozen) for 2000

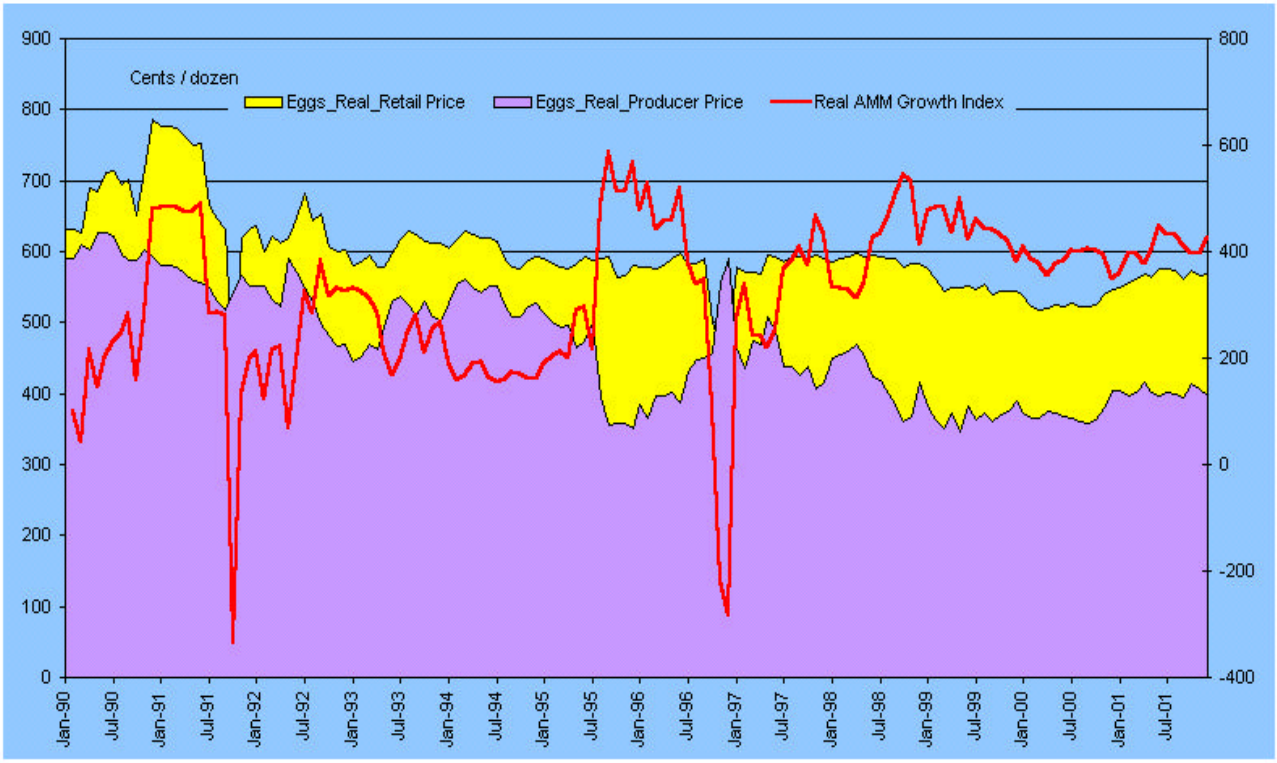
Egg producer prices have declined as percentage of the consumer price (Figure 34), although, as one would expect, at a much slower rate than in the case of products that are processed. The price trend shows two spikes that could be the result of a price war when consumer prices were actually lower than producer prices. However, in general it seems as if the producer's share of the retail price has stabilised at around 70% with a slight increase since March 2000.

The real producer prices and consumer prices are illustrated in Figure 35. The close relationship between the real consumer and producer prices is illustrated by the AMM, the growth of which has declined since January 1998 (Index value of 583) to December 2001 (454 Index value).



Source: National Department of Agriculture, 2002

Figure 34: Producer share of consumer rand for eggs, January 1990 - December 2001



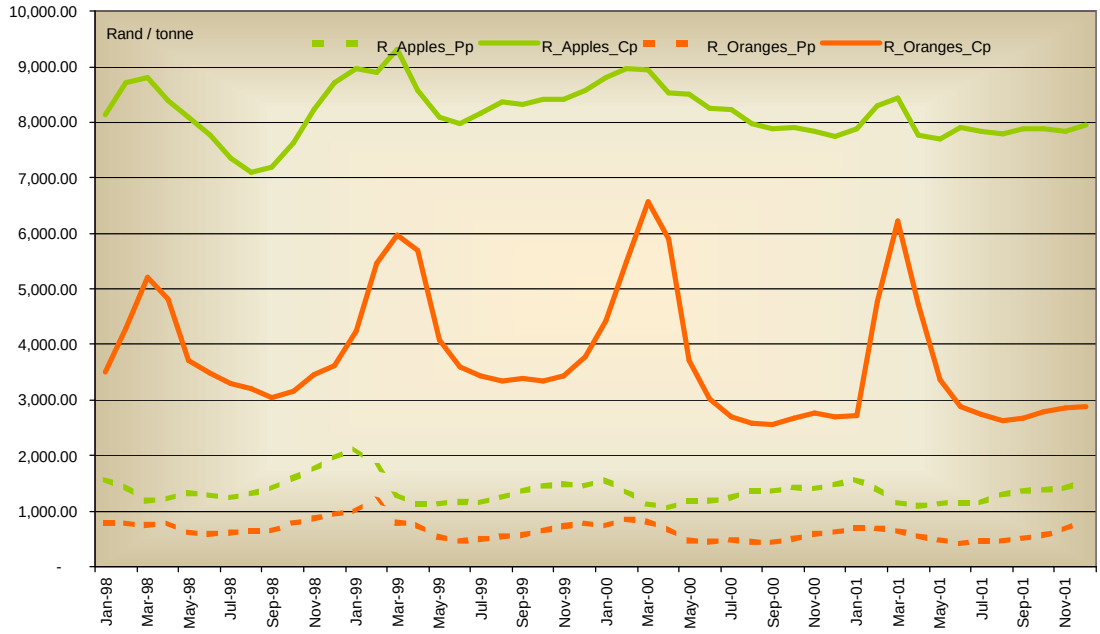
Source: National Department of Agriculture, 2002

Figure 35: Real producer and consumer prices for eggs (constant 2000 prices), 1990 – 2001

2.4.5 Fruit and vegetables

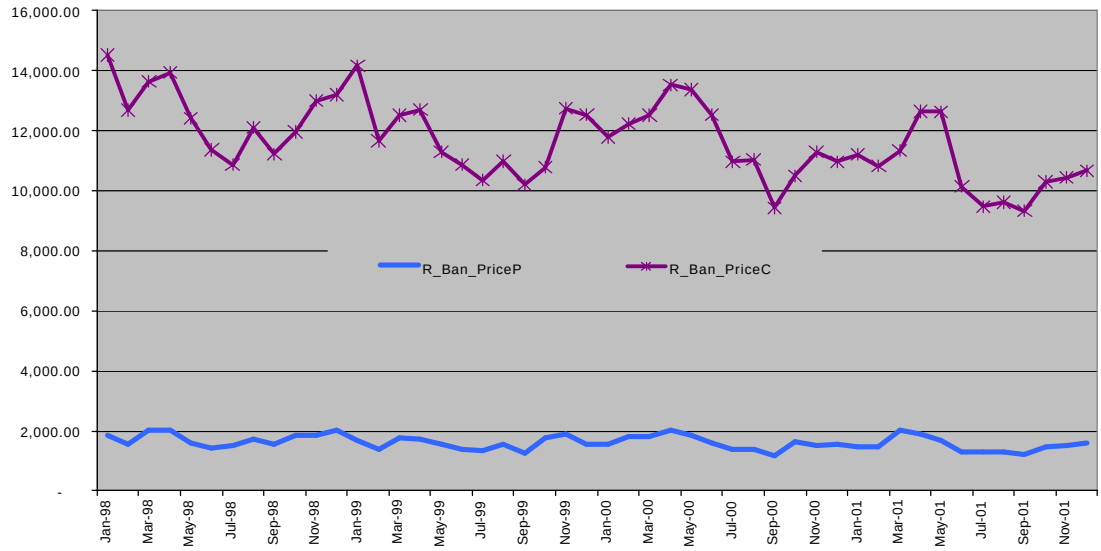
In this section we provide a few selected price trends in the fresh produce markets to highlight the fact that prices on the domestic market have largely been isolated from any of the developments in the currency market. The series of graphs below show clearly the normal seasonal trends but also highlight the fact that the real prices (in 2000 terms) have been virtually constant for the last 4 years. The argument that the potential for increased export earnings could have led to increased exports and lower availability on the local market is not supported by these data. In the first instance, South Africa exports less than 3% of its vegetable production. In the case of fruit, there is also a large difference in the quality of fruit that can be exported and that sold on the domestic market, thus the two are hardly substitutes.

The analysis of producer and consumer price trends for the most important fruits and vegetables are presented below only in graphical form and includes: apples, oranges, bananas, potatoes, onions, tomatoes and pumpkins.



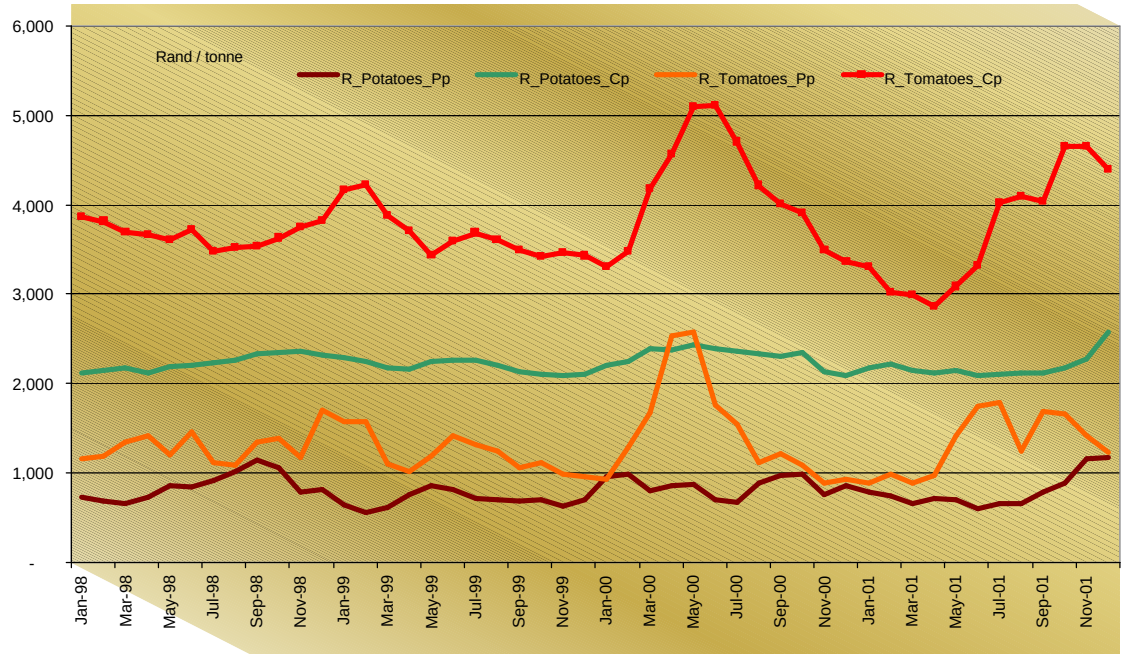
Source: Abstract, 2000

Figure 36: Real producer (Pp) and consumer prices (Cp) for oranges and apples, 1998 – 2001



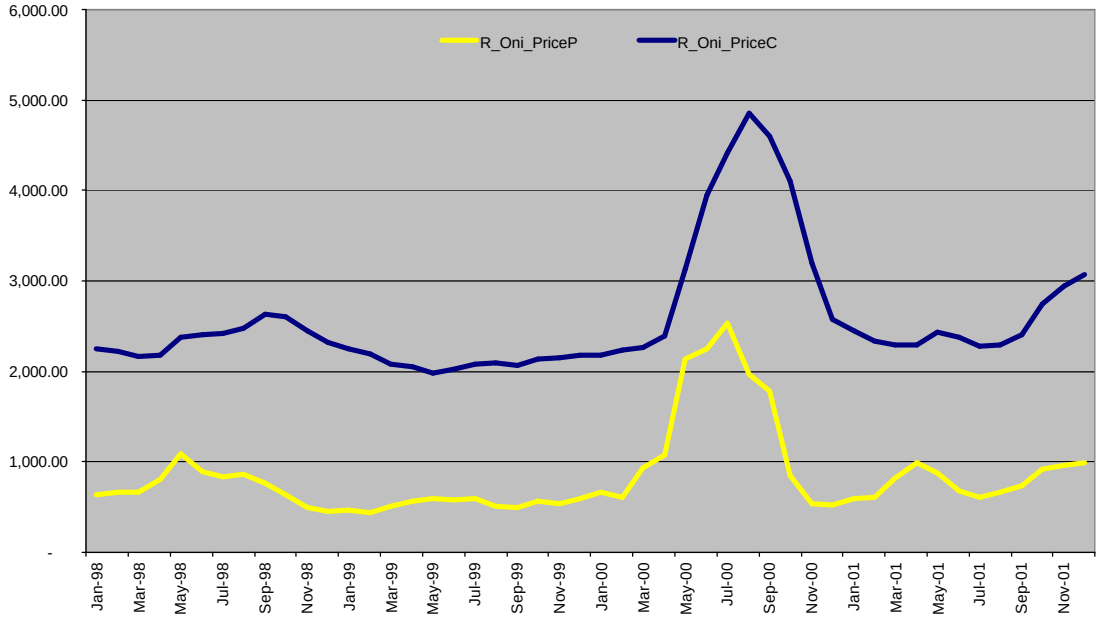
Source: Abstract, 2000

Figure 37: Real producer (Pp) and consumer prices (Cp) for bananas, 1998 – 2001



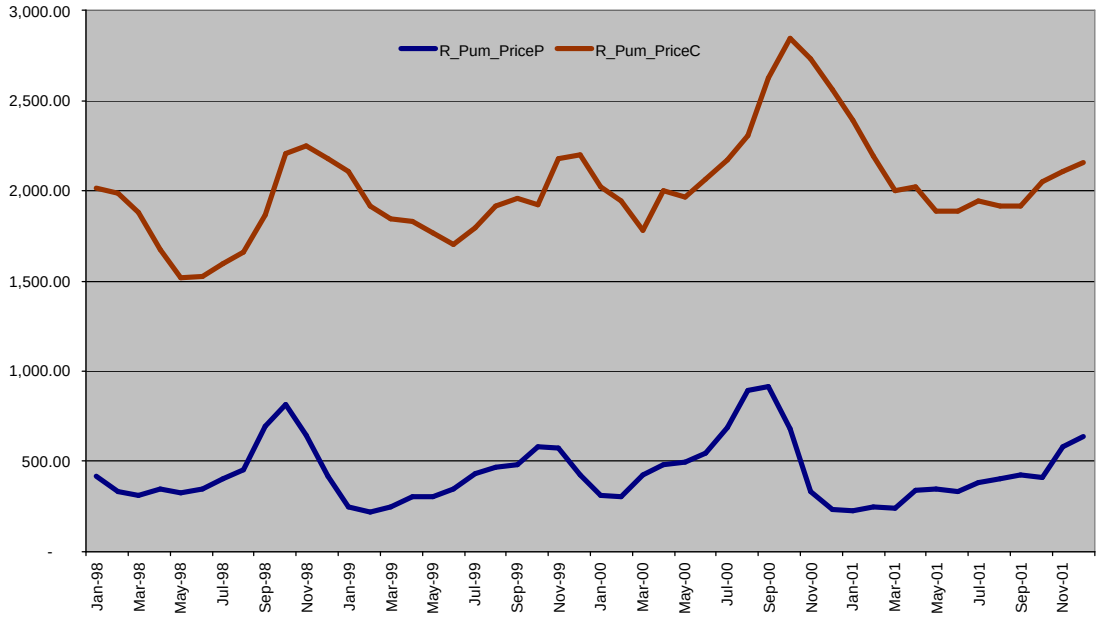
Source: Abstract, 2000

Figure 38: Real producer (Pp) and consumer prices (Cp) for potatoes and tomatoes, 1998 – 2001



Source: Abstract, 2000

Figure 39: Real producer (PriceP) and consumer prices (PriceC) for Onions, 1998 – 2001



Source: Abstract, 2000

Figure 40: Real producer (PriceP) and consumer prices (PriceC) for pumpkins, 1998 – 2001

2.5 Trends in consumer prices

In this section the broad trends in consumer prices are reviewed as a supplement to the discussion in Section 2.2 above. The data in Table 22 show the trends in the real consumer prices for selected food items over the past. While the sharp nominal increases in food prices over the last 10 months

are cause for concern, the evidence suggests that some prices (beef, mutton, fresh and condensed milk, eggs and potatoes) have in actual fact decreased in real terms from their 1988 levels.

Table 22: Real average consumer prices for selected products, 1988 - 2002

Item	Unit	1988	1992	1995	2000	2001	Mar-02
Chicken	Cents / kg	1,354.69	1,369.39	1,564.57	1,202.86	1,478.77	2,797.85
Pork	Cents / kg	2,060.68	1,765.56	1,839.43	1,664.84	1,884.86	2,897.31
Beef	Cents / kg	2,739.32	2,138.99	2,405.62	2,109.11	1,985.54	1,814.35
Sheep	Cents / kg	3,327.60	2,610.11	3,117.75	2,774.28	2,511.66	1,346.19
Bread (brown)	Cents / 800g	256.25	285.46	295.58	320.00	285.91	283.41
Cake flour	Cents / kg	413.75	552.66	514.04	519.78	497.64	496.86
Maize meal (sifted and granulated)	Cents / kg	270.31	353.53	338.97	301.78	286.38	285.20
Full Cream Milk powder	Cents / kg	3,110.94	3,242.37	3,535.22	3,533.17	3,719.50	3,266.37
Low Fat Milk powder	Cents / kg	2,809.90	2,448.38	2,606.01	2,968.75	3,117.07	3,224.22
Fresh milk	Cents / litre	346.09	373.28	300.76	326.67	340.24	329.15
Condensed Milk	Cents / kg	1,296.82	1,237.58	1,307.88	1,285.89	1,310.84	1,280.91
Eggs	Cents / dozen	591.08	611.91	576.66	523.00	552.84	535.43
Potatoes	Cents / kg	371.88	434.47	313.54	325.00	312.62	361.43

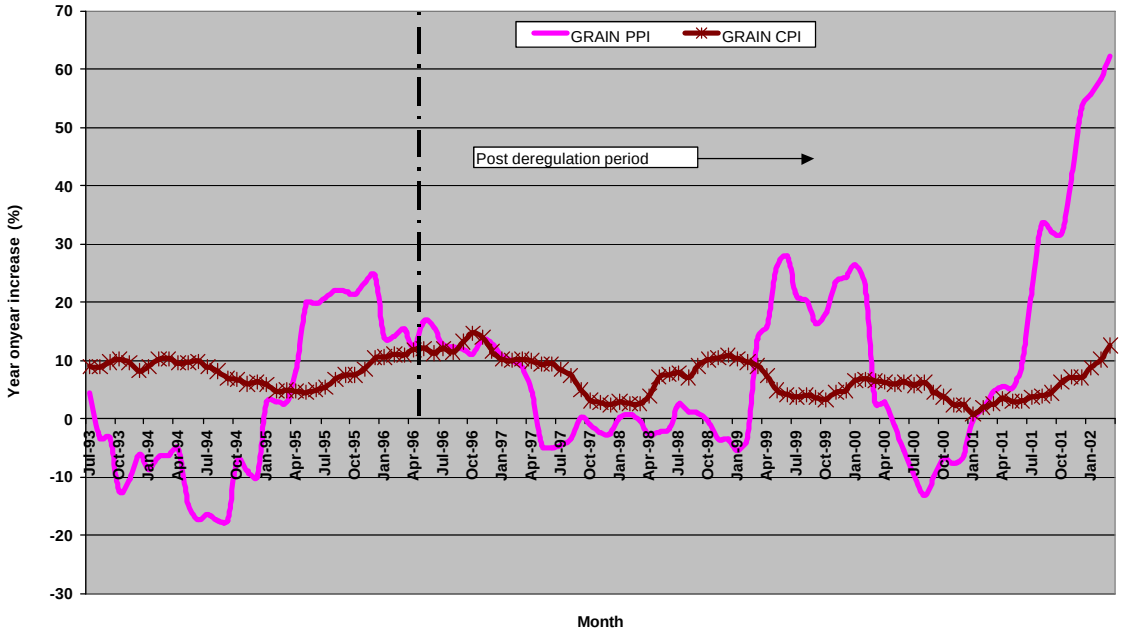
Since Table 22 provides us with a broad and sufficient overview of consumer price trends we will not be discussing each market in detail. Given the importance of maize meal, bread, dairy products and cooking oil in the consumer's basket we will only discuss these products in some detail in the following sections. Some elements of consumer prices in the other markets such as fruit and vegetables were included in the section on producer prices and are therefore not repeated here.

2.5.1 Grain and cereal products

The aggregated consumer prices for maize meal, wheat flour, bread and rice for the periods 1990-1995, 1996-2000 and the most recent available 4 months are shown in Table 23. These data show that consumer prices have increased throughout this period, although at a slower rate between 1996 and 2000. Figure 41 shows the trend in real consumer prices relative to real producer prices. It is evident that there is little direct correlation between these two price series. Real producer prices fluctuate more than real consumer prices, and in some cases these prices move in the opposite direction.

Table 23: Average annual and monthly growth rates in CPI for grain products

Period	Average monthly increase (%)	Average annual increase (%)
1990-1995	1.16	14.87
1996-2000	0.49	6.09
2001-March 2002	0.88	11.03



Source: Calculated from STATSSA, time series

Figure 41: Monthly increase in the PPI and CPI for grain products, 1993 – 2002

The data in Tables 24 and 25 below show the trends in the composition of the margin between the farm gate price for wheat and the retail price of bread. This comparison is instructive, as the degree of processing required to transform wheat into bread is relatively negligible when compared to products such as wine, sugar or ready-to-eat meals, hence the margin should be relatively small. However, this logic is immediately negated by the fact that the producer's share in the price of a loaf of brown bread (which requires less processing) is smaller than the share for white bread, and has become even smaller through the 1990s. Overall, producers lost half of their margin for both white and brown bread between 1990 and 1998.

The millers have not fared much better, and bakers have fared somewhat better. However, the real winners in this game have been the **retailers**. Retail margins for white bread have quadrupled during the 1990s, while for brown bread they increased more than five-fold.

Table 24: Percentage share in the retail price of white bread

	1990/91	1996/97	1998/99
Producer	33.3	24.2	17.9
Infrastructure	6.7	3.3	4.4
Miller	16.7	10.8	9.8
Baker	40.0	42.0	43.9
Retailer	3.3	7.4	11.8
Government	0	12.3	12.2
Total	**100**	**100**	**100**

Source: NAMC Section 7 committee: Wheat to bread value chain (1999)

Table 25: Percentage share in the retail price of brown bread

	1990/91	1996/97	1998/99
Producer	32.4	23.4	16.7
Infrastructure	6.7	3.8	4.1
Miller	20.9	15.7	12.6
Baker	36.2	46.0	46.3
Retailer	3.8	11.1	20.3
Government	0	0	0
Total	**100**	**100**	**100**

Source: NAMC Section 7 committee: Wheat to bread value chain (1999)

The trend in the real price of white bread is reflected in Figure 42. The comparison with real producer prices for wheat makes for interesting reading. Real retail prices increased quite rapidly – at 2.3 % per annum on average – between 1989 and 2000. This is largely the consequence of the abolition of the government subsidy on bread in 1991. The period of fastest growth was between 1990 and 1995 when real bread prices increased by 3.6% per annum.

Source: Calculated from NDA food price database

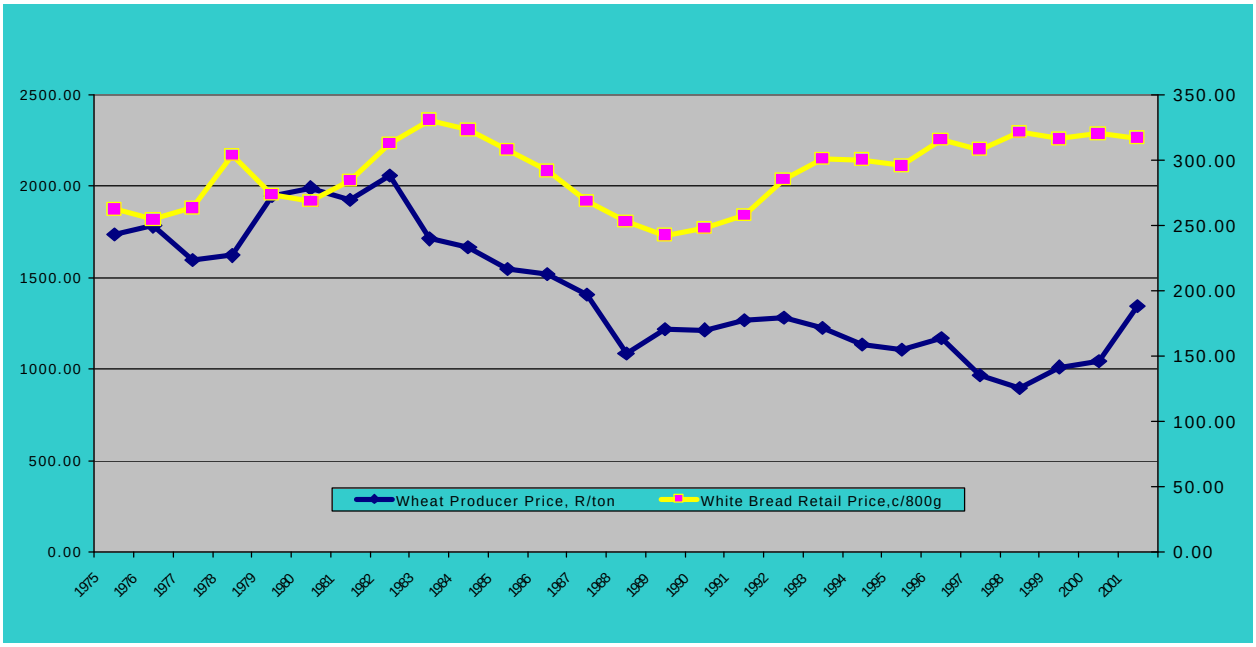
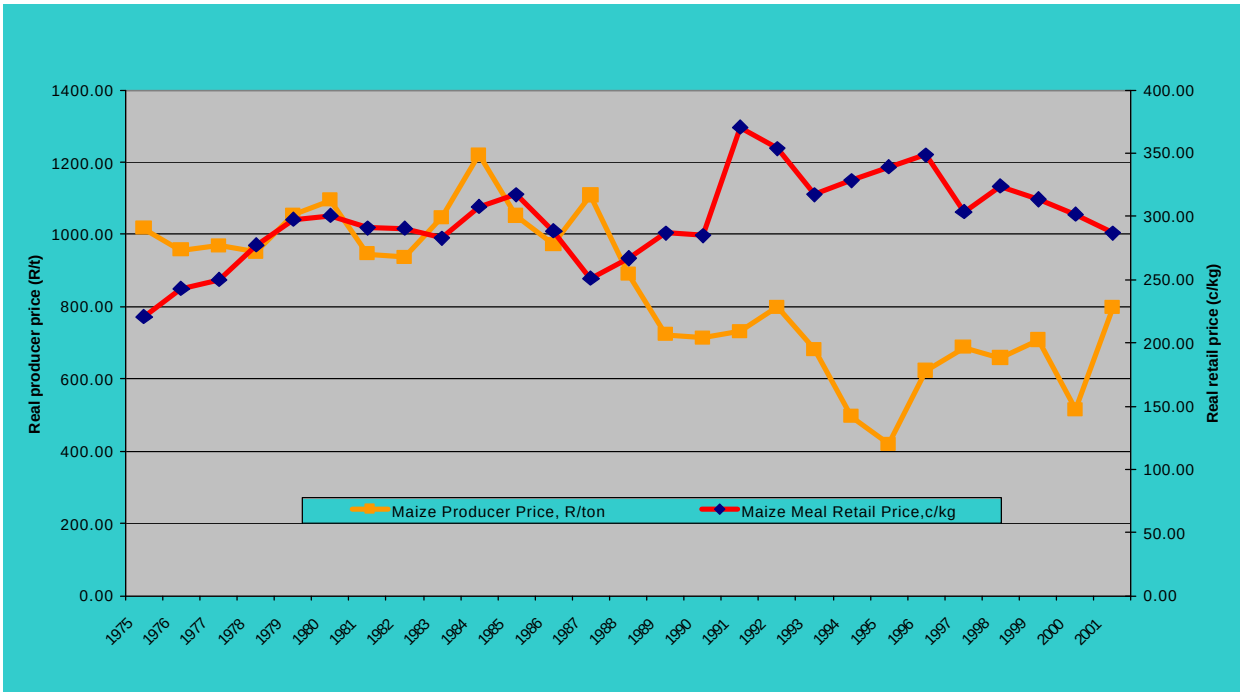


Figure 42: Real consumer prices for white bread, 1975 – 2001

The retail price of white maize meal is a key aspect of the whole debate on rising food prices and for this reason it is important to briefly reflect on the annual trend in the price of white maize meal. Again we compare it with the trend in the producer prices for maize. It is interesting to note from Figure 43 that in the period 1990 – 1995 real producer prices of white maize decreased on average by 10.6% per year, but retail prices of white maize meal increased by 3.5% per annum over the same period. However the reverse scenario applied in the 2000-2001 period when retail maize meal prices declined on average by 5% per annum and real producer prices increased at a rate of 54% per annum. The more recent increase in producer prices has, however, been transmitted through to retail maize meal prices in early 2002.

Modelling the cause and effect relationships between the producer and consumer prices is no easy task. Nevertheless, the anecdotal evidence provided here lends credence to the argument that millers, wholesalers and retailers of grain products have more power to influence prices than the farmers have.



Source: Calculated from NDA food price database

Figure 43: Real retail price for white maize meal (constant 2000 prices), 1975 – 2001

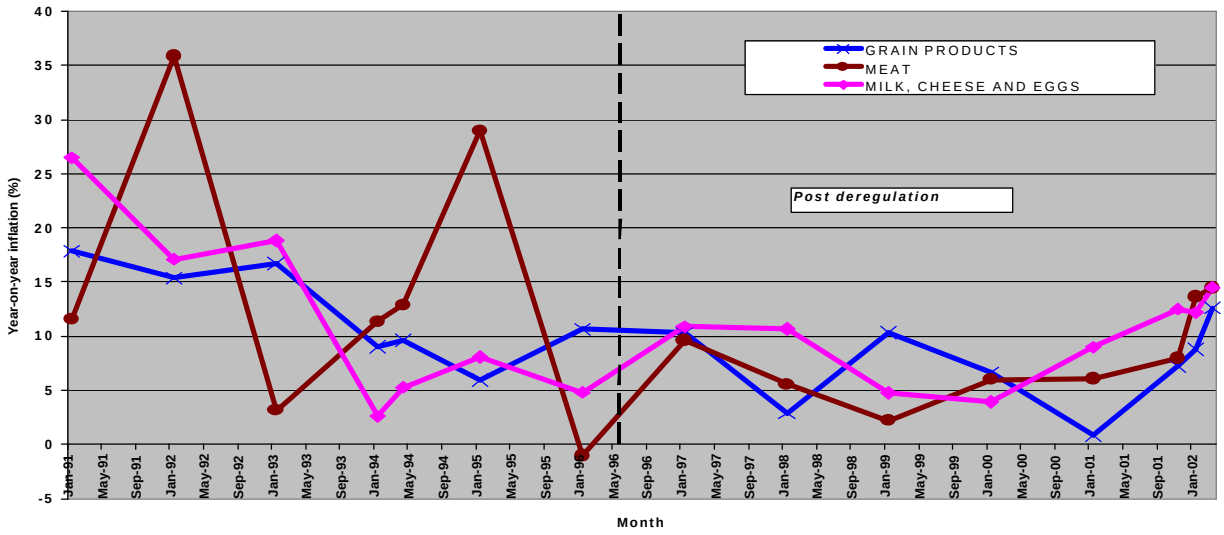
In trying to determine the causes of the increase in maize meal prices the real maize meal price was modelled as a function of real maize meal price (lagged for one month), the real SAFEX white maize spot price (lagged for three months), the real retail potato price (lagged for four months) and the producer price index of milled grain products (lagged for three months). All variables are significant at the 90%, or greater, level of significance except for the real potato retail price which is significant at the 75% level. All the variables met our *a priori* expectations with respect to economic theory. The model successfully explains 87% of the variation in real maize meal price through the inclusion of the mentioned variables. The Durbin-Watson statistic is 2.19 indicating that there is no serial correlation. The model shows that the transmission from producer price to retail price takes approximately 3 months and corresponds to the evidence obtained from the major millers in terms of their procurement and stock policies. The elasticities amongst the explanatory variables are listed below:

Box 5

Variable	Elasticity with real maize meal price
Real white maize SAFEX price lagged 3 months	0.067
Real potato retail price lagged 4 months	0.095
Producer price index milled grains lagged 3 months	0.422

The elasticities indicate that a 1% increase in the real SAFEX white maize spot price 3 months ago will cause the current real maize meal price to increase by 0.067%. The same holds for the lagged real potato retail price and the lagged producer price index of milled grains, which will increase the maize meal price by 0.095% and 0.422% respectively. It seems that the impact of milling costs and marketing costs is far greater than the spot price itself. This could be the result of the use of historic data, i.e. the effect of the recent increase in producer prices has not yet been fully transmitted through to retail level due to the procurement (e.g. buying on contract where prices are fixed) and hedging strategies followed by the millers. In addition the deliberate efforts by retail chains to keep prices of major staple foods low through locking suppliers into 6-12 month price deals could also explain part of our result.

The annual increase in the CPI for grain products, meat, and dairy products is shown in Figure 44 confirming part of the discussion immediately above. In addition the data conform to the trend described in relation to Figures 6 and 7 above.



Source: Calculated from STATSSA CPI database

Figure 44: Annual increase in the CPI for grain, meat and dairy products

2.5.2 Dairy products

The South African consumer market for milk and dairy products is well developed, and a comprehensive range of milk and dairy products in a variety of pack sizes is freely available.

Table 26: The market for dairy products, 1996

Product	Unit	Production	Estimated Consumption	Imports	Exports
Pasteurised liquid milk	m litre	860	860	-	-
Ultra pasteurised milk (UHT)	m litre	225	225	3,466	7,112
Yoghurt, maas, buttermilk	m litre	125	125	0,068	0,750
Cheese – all types	t	60 000	65 000	3 783	1 258
Milk powders	t	20 110	27 837	4 810	11 162
Condensed milk	t	18 100	17 400	263	3 922
Butter	t	8 100	11 410	5 757	1 571
Whey & buttermilk powder	t	n.a.	n.a.	7 449	1 343

Source: SA Dairy Foundation, RSA-market. Customs & Excise: imports & exports

The market for dairy products is conventionally divided into drinking and concentrated products, with the first three rows in Table 26, including also blends and cream, representing drinking products, which make up approximately 60% of the total volume sold. Most dairy products are distributed through hypermarkets and supermarkets (Table 27). The size of the informal trading sector with thousands of small spaza shops is difficult to quantify. Available data (ESKOM, 1998) show that of the 9,1 million households in South Africa, 2,4 million support shops in size and smaller than spaza shops for occasional and 410 000 households for their main grocery shopping.

The retailer is the primary outlet for dairy products to the consumer and this puts it in a position of strength and accounts for the struggle in which both retailer and processor are engaged to secure custom, margins and authority. This echoes the general trend in the international food sector (Baas *et al*, 1998). The larger retailers dictate the delivery times and merchandising is at the cost – generally 3% of wholesalers' in-store turnover - of the processor/wholesaler. Retailers do not ordinarily accept responsibility for shelf losses and their mark-up on white drinking milk is on average 18% and on by-products (e.g. yoghurt) 28%, while the chains demand a 10% rebate on the wholesale price and the dairy companies have to pay for shelf space.

Table 27: The division of the formal trade in dairy products, 1996

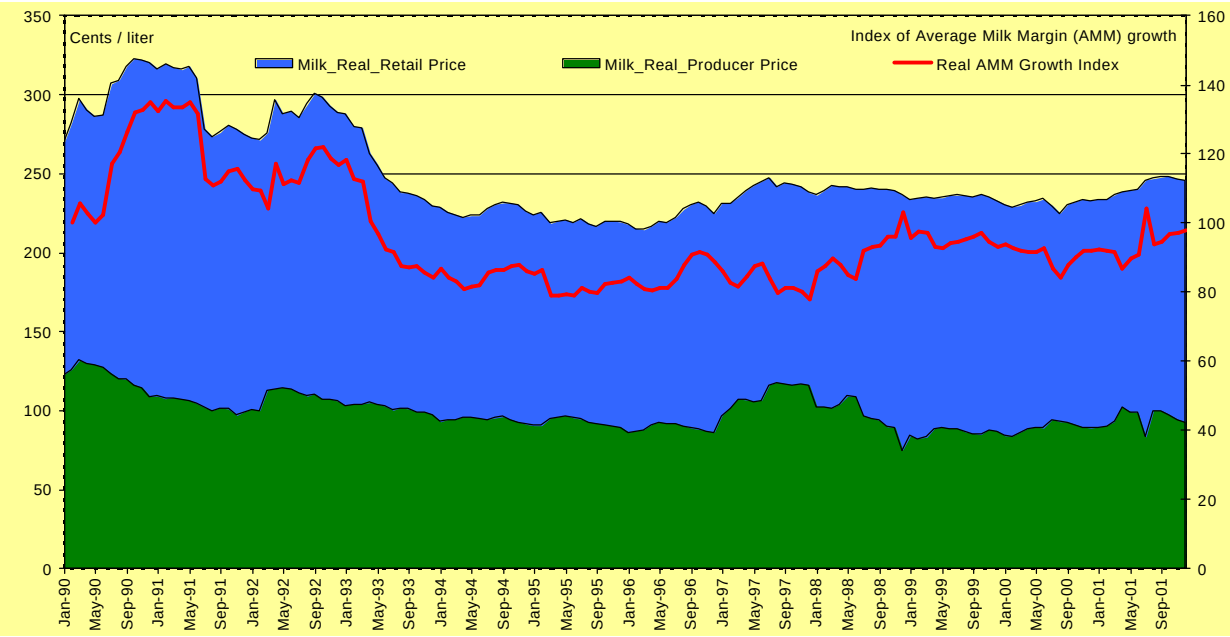
Store types	**No. of stores**	**% Outlets**	**Turnover (Rm)**	**% Value**
Hyperstores	26	0.1	2 174	9.1
Supermarkets	765	2.3	10 115	42.4
Subtotal	**791**	**2.4**	**12 289**	**51.5**
Superettes	1 107	3.4	3 258	13.7
Subtotal	**1 898**	**5.8**	**15 547**	**65.2**
Urban Grocers	11 418	34.8	3 545	14.9
Rural Grocers	10 916	33.3	2 946	12.5
Café/Confectioners	8 572	26.1	1 798	7.4
Total	**32 804**	**100.0**	**23 836**	**100.0**

Source: Hermann, 1997

The relationship that manufacturers and distributors of dairy products have with retailers is often ambivalent. Where dairy companies attempt to win consumer loyalty by producing attractive and successful brands, retailers compete with 'no-name brands' in pursuit of repeat shoppers. On the other hand, retailers are obliged to co-operate with dairy companies in approaching the consumer and can benefit from working with them on decisions regarding the product range composition, promotional activities and product development (Baas *et al*, 1998). Food processors' and retailers' success in competing for consumer loyalty increasingly hinges on the differentiating value of cost-increasing services such as advertising, trading stamps, coupons, and elaborate merchandising. These activities may or may not represent 'true' consumer desires, but there is no doubt that they have added significantly to the cost of food marketing.

The structural changes in the dairy industry discussed earlier have had an ambivalent effect on the gap between producer and consumer prices of dairy products, and the relationship between producer and consumer prices is not clear. To illustrate this, the prices of a range of dairy products are analysed relative to the price of processed milk (i.e. the 'drinking products' identified above), which comprises roughly 60% of all dairy sales. In 2001 the fresh milk consumption was 1 202 million kilograms expressed in milk equivalents (SAMFED, 2002).

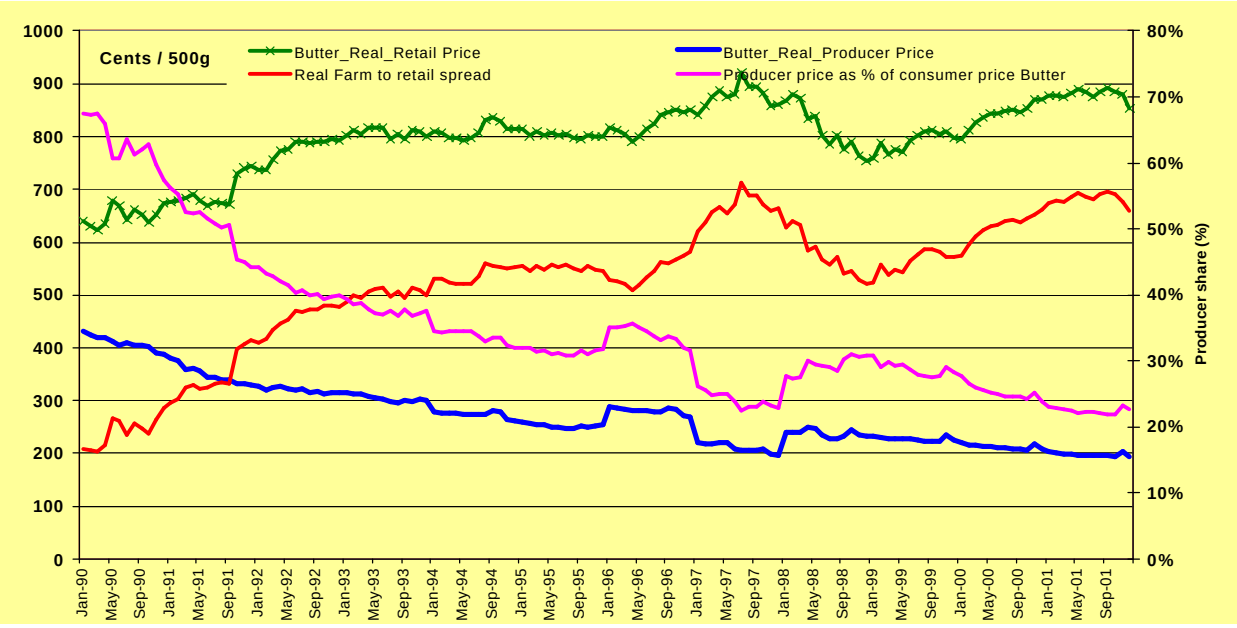
The first of these analyses (Figure 45) illustrates the relationship between the price of raw and processed milk. These data show that the real price of raw milk increased for most of the past decade, excepting for a period during 1998. Retail prices, on the other hand, have increased throughout the entire period, and at a rate faster than the farm gate price. This is reflected in the growing margin between these two prices. The industry believes that the increased margin can largely be attributed to value adding via long life milk (UHT) and a consumer preference for more expensive plastic containers and sachets that have largely replaced carton containers. Long life milk consumption increased from 18% to 28% of total consumption from 1991 to 1999, while milk sold in carton containers declined from approximately 38% (1992) to 23% (1999) (Tetra Pak, 2000). However, it is clear that these developments cannot explain the entire increase in the margin, especially the sharp increase since 1997.



Source Abstract, 2000 and MPO

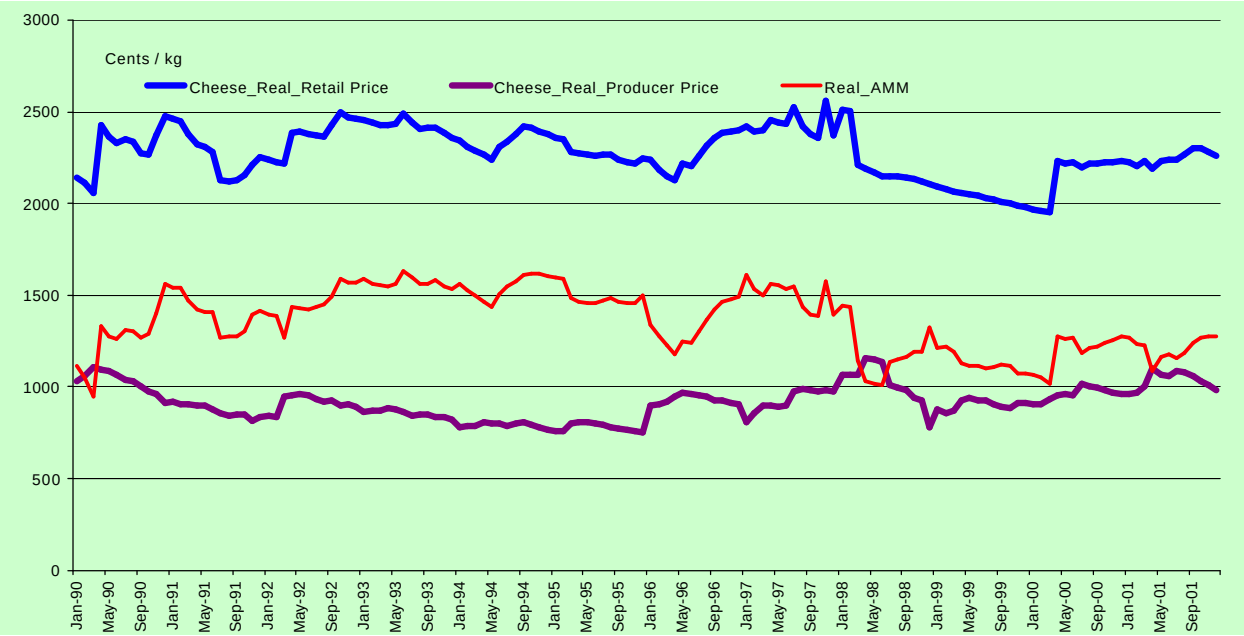
Figure 45: The real price of and the growth in the marketing margins, 1990- 2001

Figure 46 shows the relationship between the price of milk sold for the production of butter and the retail price of butter. Here the data show that the margin between the farm gate and the retail price has increased by more than threefold (from 200 cents/500g in 1990 to 700 cents/500g in 2001) despite the fact that the real producer price of butter declined throughout the decade. The reason is the sharp unexplained increase in the retail price of butter, starting in the beginning of 1999.



Source: Abstract, 2000

Figure 46: Real producer price of milk for butter and real retail price of butter: 1990 - 2001

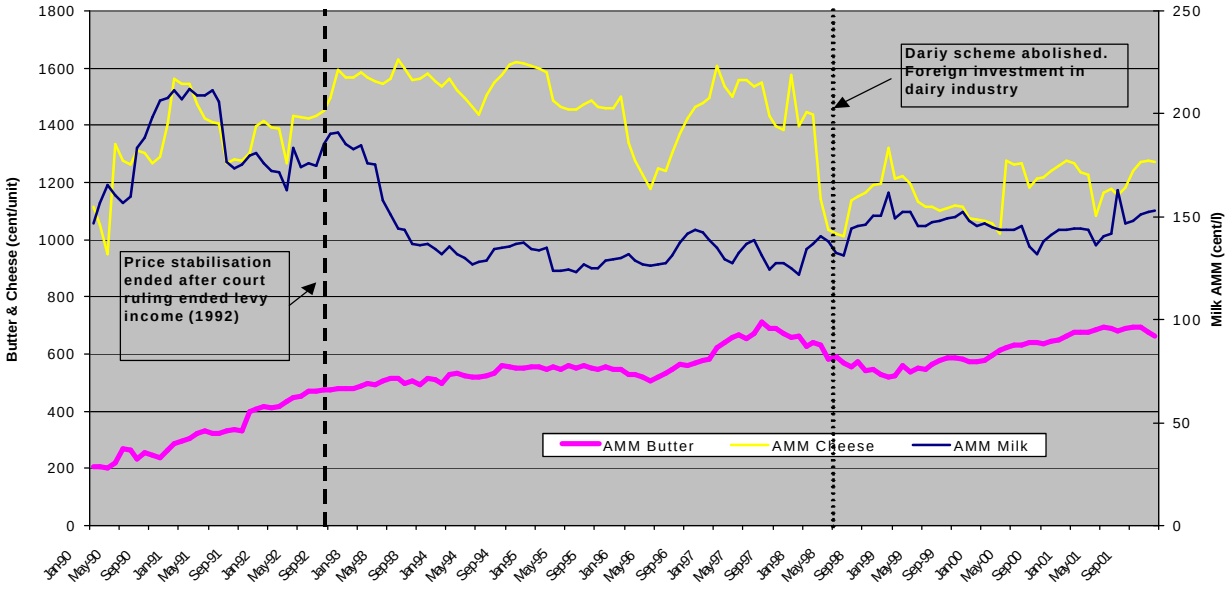


Source: Abstract, 2000

Figure 47: The real price of cheese, 1990 – 2001

The marketing margin for cheese, on the other hand, has declined since the beginning of the 1990s (Figure 47). The explanation may lie in the fact that cheese, milk powder and butter are balancing products[18]. The over zealous import of dairy products and the increase in milk production following the rise in producer milk prices culminated in a build up of cheese stocks, and hence suppressed increases in retail prices. As these stocks have largely been worked off, partly through exports, the margin in expected to increase again. Figure 48 provides a comparison of the farm-retail spread for the 3 main dairy products. Deregulation seems to have had a positive effect on real marketing margins through increased competition, as discussed above.

Figure 48: Real farm-retail spread for milk, cheese and butter, 1990 - 2001



2.5.3 Sunflower Oil

One of the other major food items for our poorer households is cooking oil. Having discussed the

[18] When raw milk supply is in surplus, the surplus is processed as cheese, butter or powder. The latter two can be reconstituted as milk in case of a shortage of raw milk.

producer price of the main raw material, sunflower seed earlier it is now necessary to consider the trend in consumer prices of cooking oil. Figure 49 below illustrates the nominal and real price (constant 2000 prices) of 750ml units of cooking oil between March 1998 and January 2001. Real prices increased from R4.50 in 1998 to around R5.00 per unit in January 2002. A brief survey of supermarkets in Gauteng and Limpopo provinces during April 2002 showed retail prices of these units to be around R7.50 – equivalent to a real price of R6.59. There has been a rather dramatic increase since the low of R4.20 around October 2000 – thus an increase in real terms of 57% between October 2000 and April 2002.

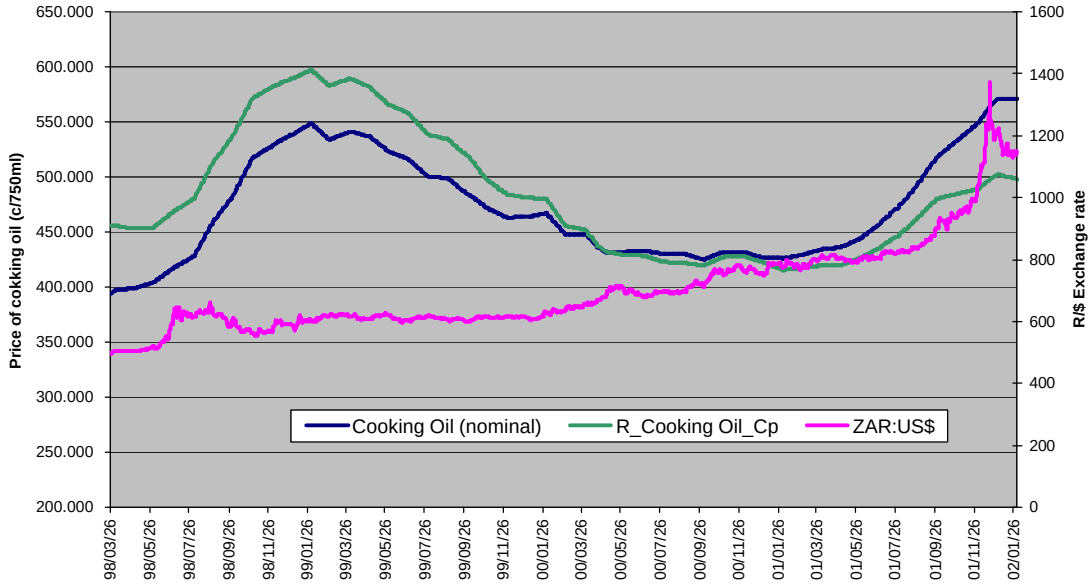


Figure 49: Nominal and real retail prices of 750ml cooking oil versus the exchange rate

Figure 50 compares the trend in real producer prices of sunflower seed with that of real retail prices of sunflower cooking oil. The trend is very similar. Calculating the farm-retail spread is complex and could lead to erroneous interpretations since the oil extractions generate a number of by-products, which are also valuable. In interpreting these figures one should also remember that sunflower and other oils, such cotton seed oil together, with the various oil cakes are ranked amongst South Africa's top 5 agricultural import commodities. In 2000 South Africa imported R167 million worth of oil (sunflower and cotton seed) thus the exchange rate obviously played its role in increasing the landed costs of these commodities – as reflected in Figure 49 above.

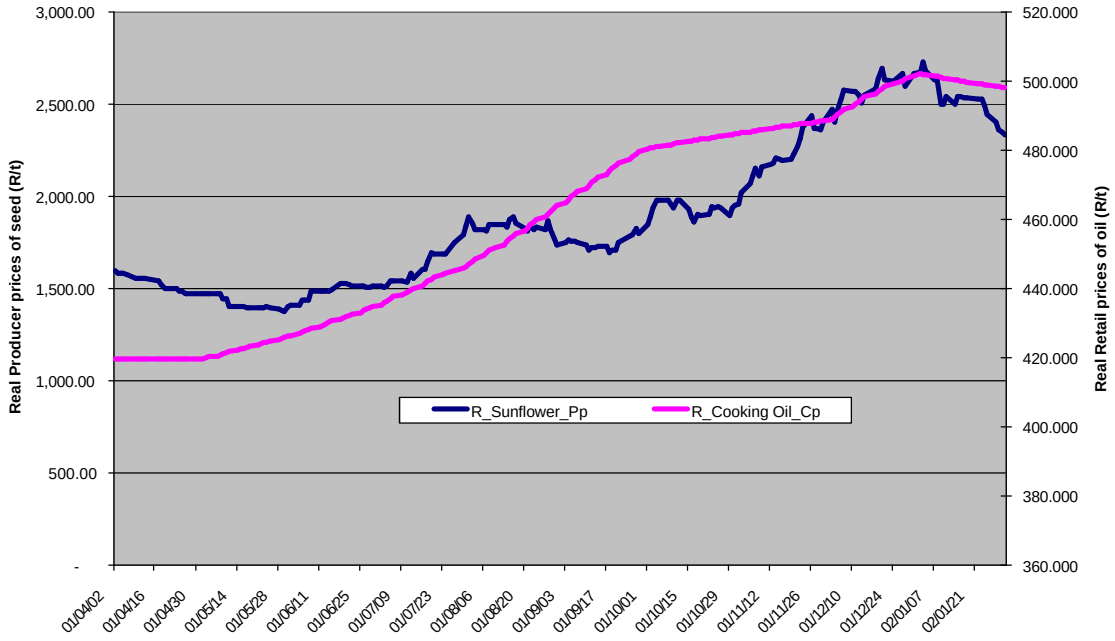


Figure 50: Real price of sunflower seed vs. real price of cooking oil, April 2001 to January 2002

2.6 Concluding comments: Are commodity prices a leading indicator of inflation?

Much of the discussion in this Chapter focussed on the key question on the impact of the rise in the producer prices of key agricultural commodities (in particular maize and oilseeds) on food inflation and increase in total inflation. The evidence provided here has so far provided fairly convincing evidence of how rising commodity prices is slowly but surely filtering through to the general level of prices in the economy. The discussion in Section 2.2 has clearly shown how food price increases are driving the increase in the CPI.

It is for this reason that some studies in the literature has been asking the question whether commodity prices can serve as a leading indicator of inflation. Moosa (1998) is one of the authors who recently shown that commodity prices can serve as a leading indicator of inflation. For a pure lack of time we could not test this hypothesis in the South African context but our evidence presented in this chapter intuitively leads us to the same conclusion.

The chapter focussed considerable attention on the causes of commodity price increases. Our analysis of price trends and the various statistical tests provide a rather convincing and consistent story, namely that **the recent increase in the farm gate price of basic food commodities has come about as a result of a unique combination of five factors**. These are (a) an increasing world price for these commodities, (b) a lack of competition in the supply chain beyond the farm gate, especially at the retail level, (c) a fast and severe depreciation in the value of the currency, (d) a shortage of maize in the SADC region, and (e) a climate of uncertainty, created specifically by the unfortunate circumstances surrounding the land reform programme and the elections in Zimbabwe, and more generally by the instability in parts of Central and Southern Africa.

CHAPTER 3

SOUTH AFRICA'S CONSUMER PRICE INDEX (CPI) FOR FOOD

3.1 Introduction

The consumer price index (CPI) measures how the price level of consumer goods and services purchased by households have changed between two periods of time. The CPI was first used in 1707 when William Fleetwood compiled a simple index to estimate the average change in the prices paid by Oxford University students over the previous two and half centuries. During 19th century, interest in price indices gathered momentum as a result of the work of Irving Fisher. In 1925 the CPI became institutionalised when the Second International Conference of Labour Statisticians convened by the International Labour Organisation (ILO) promulgated the first international standards of measurement. The original international standards have been revised three times, namely in 1947, 1962 and 1987, each revision being approved by the International Conference of Labour Statisticians. The present Manual contains the draft resolution for the fourth revision of these international standards submitted to the XVIIth International Conference of Labour Statisticians in 2003. The manual is available on the Website of the ILO[19].

3.2 Calculating the CPI[20]

The first step in calculating the CPI is to determine what goods and services should be included in the index basket, as well as their relative weights. This is conventionally done with the help of a Household Budget Survey/Household Expenditure Survey. A point-of-purchase or retail survey is also used to determine where the goods and services are acquired from, to determine where the prices should be collected.

The next step is to classify all these goods and services, so that they can be aggregated into different items/groups and in the end into the All Items Index. Products are grouped because they have a common end-use or because they are considered to be substitutes for each other. The weights attached to the lowest level of goods and services, the elementary aggregate, are assigned by means of a formula, which could either be an arithmetic mean (average) or a geometric mean[21]. The basket with the weights is constructed periodically, in most cases depending on the frequency of the surveys on which the weights are based is constructed.

Prices are than collected (mostly monthly, but there are some that are collected weekly, quarterly, biannually or even annually). These prices are calculated into an index with the help of a formula, the most commonly used being the Laspeyres formula[22].

3.3 The CPI in South Africa

Currently Statistics South Africa (StatsSA) compiles and disseminates a number of different CPI aggregates, each serving a number of different analytical purposes. The various consumer price indices calculated for SA include:

- **Consumer Price Index**: This index is used to calculate the official or headline rate of inflation and consists of price increases for all goods and services in the main metropolitan areas of the country.

- **Core Index**: Certain items are excluded from the CPI basket on the basis that their prices are highly volatile, subject to temporary influences or affected by government policies. These exclusions include fresh and frozen meat and fish, fresh and frozen vegetables, fresh fruit and nuts, interest rates on mortgage bonds and overdrafts/personal loans, and changes in VAT and assessment rates. This index is used to calculate core inflation and is a reflection of the underlying inflationary pressures in the economy.

- **CPIX**: The CPI excluding interest rates on mortgage bonds (CPIX), a measure designed to assist with inflation targeting.

[19] See Appendix 3 for a brief history of the development of the CPI, and Appendix 4 for an explanation of the evolution of the formal definition. References to the website are provided in the Appendices.
[20] The procedure for calculating the CPI is shown in more detail in Appendix 5, while the base data used for the calculation of the Food Price Index in South Africa are provided in Appendix 9.
[21] See Appendix 7
[22] The different formulae and their basis of calculation are explained in Appendix 3.

- **CPIF, or the Food Price Index**: Only the food items appearing in the CPI basket are included. The index is regarded as useful to assess the impact of price increases on poverty, as food is the single biggest item in the total basket for the CPI.

The more recent trends in these measures are shown in Table 28 as an illustration of the differences between these indices. It is evident that CPIF increased faster than the other indexes in this period, and thus contributed materially to the increase in the overall rate of inflation in the country.

Table 28: The different CPI indexes measured in South Africa, 2001-2002

Main Indices	Indices (2000 = 100)			Percentage change between Feb 2001 and Feb 2002
	February 2001	January 2002	February 2002	
CPI (Metropolitan areas)	104.1	109.0	110.4	+6,3
Core Index	104.4	110,7	111,4	+7.5
CPI X	104.1	111.2	111.9	+6.7
CPIF	102.4	113.9	114.8	+12.1
CPI excluding food price index	104.1	107.7	110.2	+4.8

Source: StatsSA Statistical release P0141.1 (19 March 2002)

The extent of expenditure on goods and services purchased is derived from a five-yearly survey on the Income and Expenditure of Households. The results of this survey are also used to determine the relative importance (weights) of each item in the 'basket' of goods and services. The survey is conducted every five years among a sample of 30 000 households. The sample is apportioned on a *pro rata* basis among households in the urban as well as the non-urban areas, and includes people living in all types and sizes of dwellings.

In South Africa, expenditure group categories are used instead of income group categories to group products and services. This is done in accordance with international guidelines set by the International Labour Office. The boundaries of the expenditure group categories are set as the quintiles of the total number of households in South Africa, i.e. of the lowest 20% of the population, the next lowest 20%, etc.

The sampling for the Survey on Retail Prices is conducted in three phases. First, a sample of goods and services, based on the information collected through the Survey of Income and Expenditure of Households, is designed and selected. Second, a geographical sample for price collection is designed and selected. Currently 13 major metropolitan areas, covering all nine provinces, are included in the geographical sample for price collection. The 'other urban areas' are covered by nine provincial samples of four to five urban areas each, depending on the population size of the area. Thirdly a retail trade and service outlet sampling frame is constructed, based on available data sources, mainly the business register of StatsSA, telephone directories and lists obtained from the head offices of chain stores. Specific retail trade and service outlets are selected randomly within each area. The sample of outlets is revised every five years when the weights are revised.

On this basis an average of 110 000 price quotations are collected each month from approximately 2 200 outlets by means of 6 700 questionnaires. The indices are based on retail trade and service prices. Price information refers to the first seven days of the relevant month, while the prices of all items include VAT where relevant.

Price indices are calculated using a geometric mean, while group price indices are calculated by weighting product indices with the relevant product weight, according to each weighting structure, using the Laspeyres formula.

Two problems can immediately be identified with respect to the measurement of CPIF. First, the definition of urban and non-urban areas is problematic, as it rests on the administrative distinction between formally proclaimed towns (urban) and other areas (non-urban) regardless of the actual circumstances prevailing. The result is that no accurate 'rural' food basket is calculated for South

Africa. Second, the price survey is confined largely to the formal sector, and ignores the substantial sales of food products through informal outlets in urban areas, (e.g. through spaza shops and hawkers) as well as formal and informal sales in rural areas. As the majority of the poor in the country live in these areas, this means that it is not possible to readily trace the impact of policies that affect prices on poverty.

3.4 Evaluations of the South African CPIF

The BTT report of 1992

The Board on Tariffs and Trade (BTT, 1992) report on the functioning of the price mechanism in the food chain had as part of its terms of reference an assessment of the CPIF from 1980 to 1991. The report found that CPIF rose by 397%, at an average annual rate of 15,7%, over this period, compared to 352% or an average annual rate of 14,7% for the all-items index. At that time cost-push factors were found to bear the most responsibility for food inflation.

The report also pointed to the dangers of misinterpretation and misuse of the indices. Simultaneously certain retail chains cast doubt on the published statistics, indicating that their own studies reflect a substantially lower figure for food price inflation. However, the BTT report recognised that the fact that wholesale and retail food prices had risen could in part be attributed to improvements in the quality of much of the produce offered, to changes in the way they are presented to the customer, and to changes in consumer tastes. Given the choice between cheaper prices, improved quality and greater convenience, some customers show by their own actions that cheaper prices are not always their first preference and seldom their only criterion when purchasing food. On the other hand, poor people are generally more interested in the lowest possible price.

External evaluations of the CPI

The base method used to calculate the CPI in South Africa has remained the same in recent years. Stats SA recently requested Statistics Sweden to evaluate the present CPI (Haglund, 2000). This report came to the conclusion that:

- The index is compiled by means of internationally recommended index formulas and methods for dealing with substitution and quality change are expected to be appropriate for most of the different product areas covered;
- In general the index, as well as the derived indexes that are presently published are likely to result in suitably reliable results regarding the rate of change of South African consumer prices;
- Although the report mentions areas where the methodology could be improved, there was no mention of any improvements specifically directed to the food index;
- Procedures used for dealing with substitution and quality changes should be reconsidered only for the clothing component index;
- The coverage of the index should be extended to all South African households - even if this must be done by imputing the metropolitan and other urban area indicator product indices for the rural areas.

The IMF has also evaluated the methodology for measuring the CPI in South Africa (IMF, 2001). They found that the method conforms to international best practice, and is consistent with the ILO guidelines. However, they also highlighted two points of concern:

- The exclusion of rural households and of rural outlets;
- The procedure for the introduction of new products and the treatment of quality changes.

With regard to the first concern, StatsSA responded by pointing out that in the October Household Survey of 2000 they had included a question on the place of purchase of goods and services. They had planned to take a decision on whether the prices of items sold in rural areas will be collected on a regular basis based on whether people in rural areas purchase their goods and services mainly in local rural shops. If this were the case, they would also include a weighting reflecting the purchasing patterns of people in the rural areas. As a result of this assessment, they planned to publish the total CPI (including rural areas) from early 2002. The second of these concerns is more of a generic problem, and will not be addressed further here.

The South African method in comparative context

Table 29 shows the share of food in the CPI in 13 countries of the world, selected to represent a spread of developed, developing, and middle-income food exporting countries, and on the basis of data availability. This shows that the weight of food in the CPI in South Africa is lower than that of developed economies such as Ireland, Australia, Canada and New Zealand, as would be expected. However, the share is lower than countries such as Japan, Hong Kong and Chile, where per capita income is higher than in South Africa.

A part of the reason why the share of food in the CPI for South Africa is lower than expected can be found in the last two columns of the Table, which shows that the South African CPIF excludes meals eaten away from the home. Food consumed away from home already represents more than 50% of food consumption in many developed countries. The example of Hong Kong in the Table is instructive in this regard, as food consumed at home represents only some 10 percentage points of the total contribution of food (26 percentage points) to the CPI. While it is less than half in New Zealand (20% of the food sub-group) and Australia (a third of the food sub-group), in Ireland it is allocated to an entirely different sub-group.

A more detailed analysis of the method of measurement of CPI in 22 countries is provided in Appendix 8.

Table 29: The share of food in the CPI, selected countries

Country	Base year	Per capita income (USD)[2]	Share of food in CPI	Share of food away from home (%)	Basis of inclusion
Philippines	1994	1 040	51.00	na	
Uganda	1997/98	300	45.20	Not included	
Malaysia	2000	3 380	33.80	na	
Swaziland	1985	1 390	30.70	Not included	
Japan	2000	35 620	28.50	na	The cost of a bowl of rice topped with seasoned beef is included in the food category of the CPI
South Korea	2000	8 910	27.12	na	
Chile[1]	1997	4 590	27.00	na	
Hong Kong	1999/00		26.67	16.67	Included, i.e. food at home makes up only 10.28% of the total for food.
South Africa	2000	3 020	25.44	Not included	
New Zealand	1999	12 990	18.50	19.71% of the food sub-group	Includes an item 'restaurant meals and ready-to-eat' in the food subgroup
Canada	1992		18.00		
Australia	1998/99	20 240	17.72	4.93% of the food sub-group	Includes an item 'Meals out and take away foods' eat' in the food subgroup
Ireland	2001	22 660	12.75	17.76	Includes a separate item 'Restaurants and Hotels' (which includes take-away) in the CPI

Note: [1]Includes beverages
[2] **Source:** World Development Indicators database, World Bank, April 2002

3.5 Assessment of the CPIF

It is evident that StatsSA has gone to considerable trouble in complying with international best practice in the calculation of the CPI. Nevertheless, even if a rural weighting is added to the CPI (and hence CPIF), three problems still remain:

- StatsSA works with an unsatisfactory definition of rural areas.

- No provision is planned for sales through informal sector outlets.
- No provision is made for food consumed away from home.

Table 30 illustrates the problems that are encountered because of the use of the peculiar definition of 'non-urban' areas, and because the reality of sales through the informal sector is ignored.

The data show that hawkers in urban areas (East London in this example) charge a price premium over formal retail outlets that is lower than the premium charged by hawkers in more remote areas (King William's Town and then Alice). Of course, these data do not reveal anything about price trends: all else being equal, if the 'rural premium' stays constant over time, inflation in the remote areas will remain the same as in urban areas. Yet this cannot be known until a more satisfactory definition of rural areas is used, and until the trends in the 'rural premium' (the result of lower population densities, higher transport costs, etc.) are measured over time. Until this is done, there has to be a presumption that prices are higher in remote areas of the country, and that this premium may not be getting smaller.

Table 30: Differences in price per kg between the East London market and hawkers/retailers (1996)[1]

Commodity	East London market[2]	Formal retail[3]	East London hawkers	King William's Town hawkers	Alice hawkers
Tomatoes (5kg Med.)	1.52	3.98	2.40	4.34	5.45
Onion (10kg Med.)	0.77	2.98	2.00	3.00	3.00
Cabbage (26kg)	0.23	2.91	1.15	1.34	1.15
Pumpkins (7kg each)	2.68	13.26	18.00	21.00	24.00
Butternut (13kg)	0.83	2.41	1.82	2.72	2.72
Potato (10 kg) July	0.83	2.98	2.50	3.52	4.23
Apples (11 kg)	1.23	1.33	3.92	6.98	8.82
Banana (20 kg)	1.47	2.74	2.00	3.75	3.75
Orange (7kg) Large	0.88	1.07	1.14	1.00	0.64

Notes: [1] These data should also be interpreted with care, as differences in packaging are ignored.
[2] Actual price per kg on the East London Market
[3] Average at the three largest supermarkets in the nodal points
Source: Bediako and Kirsten, 2001.

CHAPTER 4

THE CAUSES AND CONSEQUENCES OF PRICING MECHANISMS

4.1 Lessons from experience

The theoretical and applied literature on the interrelationships between the cost of food and poverty levels is too large to be summarised here. However, three main sources provide a clearer picture of the policy options open to decision makers in the face of increased food prices. These are a summary of the consequences of deregulation and liberalisation in Southern Africa, based on research conducted at Michigan State University for USAID, a recent investigation of the food security effects of the deregulation of agriculture in South Africa, and the work of the International Food Policy Research Institution (IFPRI) in Washington, DC. Recently, IFPRI published a paper surveying the research done under its auspices over the past two decades, as well as the impact of this research (Farrar, 2000). In this section the lessons, concentrating on lessons from Southern Africa and on methods to achieve the social objectives of food subsidies without undue distortion of the economy or excessive economic and political costs, will be summarised.

4.1.1 Southern African lessons

There have been a number of publications that have reported on research on the food security effects of agricultural market deregulation in Southern Africa. Jayne *et al* (1995), for example, investigated the effects of grain market reform and food subsidy elimination in eastern and southern Africa on access to food for low-income consumers. They examine the findings from six household-level surveys in urban areas of Zimbabwe, Kenya, Zambia, and Mozambique between 1991 and 1994, focusing on shifts in maize consumption by urban households of different income groups in response to the introduction of new commodities that have been made more accessible to consumers through market reform. In a subsequent assessment of the lessons from this research, they (Jayne *et al* 1999) summarise the benefits of food market reform as follows:

- "First, food market liberalisation has generated more successes than generally recognised. Examples include the changes in grain retailing and milling, where consumers now have expanded options and have benefited from the lower margins of small-scale hammer mills; greater availability of maize grain in rural grain deficit areas due to strengthened inter-rural private grain trade; and the rise of regional trade patterns, which is playing a critical role in promoting cost effective food systems in cases where this is allowed.

- "Second, it is increasingly clear that the private sector's response to liberalization is sensitive to a broader range of government actions than commonly understood. For example, statements of key politicians in local newspapers critical of a market-oriented system are likely to be incorporated into the private sector's expectations of the payoffs and risks to future investment in the system. There is a need for a better understanding of the kinds of incentives that the private sector responds to in order to avoid actions that make 'lack of private sector response' a self-fulfilling prophecy.

- "Third, consumer vulnerability to price instability under liberalization has not been as severe as often portrayed. Private investment in grain distribution, processing, and cross-border trade as a result of the reforms have expanded consumers' options and ability to stabilize expenditures on maize meal. These market-oriented means of stabilizing consumer food expenditures weakens the rationale for expensive government price stabilization schemes.

- "Fourth, positive government actions to reduce market instability are needed and are beginning to work in selected cases. These actions include (a) improving the transport infrastructure; (b) promotion of regional trade; (c) market information systems that are expanded to include information on prices across borders, exchange rates, and trade flows; (d) improved communication infrastructure; (e) nurturing the development of market-

oriented mechanisms (e.g., commodity exchanges) for handling price risk; and (f) alleviating the constraints on private access to foreign exchange. The potential benefits that these investments can bring underscore that there is no need to accept prevailing levels of food price instability as 'given'" Importantly, these types of investments may also reduce political risks associated with liberalized food markets, and thereby promote policy stability and consistency – key factors in promoting desirable private investment in the system.

More recently, Kherallah and Govindan (1999) analysed the welfare impacts of alternative sequencing scenarios of agricultural input and output market reforms in Malawi. Their results show that, contrary to the sequencing path adopted in the 1980s, Malawi's government should have liberalised the maize sector first, followed by the groundnut export sector, and once a supply response was generated, input subsidies could have been phased out. This sequence would have minimised the adjustment costs of smallholder farmers and would have reduced the negative impact on maize productivity and food security. Seshami (1998) carried out a similar investigation (using different techniques) in Zambia.

In another study based in Malawi, Chilowa (1998) argued that the donor-supported structural adjustment programmes have not impacted favourably on livelihoods, food security and the general welfare of the poor in Malawi. In his view, this resulted from the prescription of wrong policy packages and limited attention to poverty alleviation policies. Policies tended to concentrate on promoting market and price mechanisms, less on addressing production constraints and non-economic barriers to broad-based economic growth. The losers are mainly smallholder farmers who are net food buyers, low-income or wage earners in urban and semi-urban areas and smallholder farmers in remote areas. The winners are smallholder farmers who are net food sellers, private traders, institutional traders and the state marketing agency.

4.1.2 South African lessons

The report on the effects of deregulation on the poor in South Africa of the National Agricultural Marketing Council (ECI, 2002) argued that deregulation of South African agriculture was merely one part of the larger political, social and economic restructuring of the country, thus it was difficult to assess the food security effects of one change in policy. Yet the report argues that South Africa's experience with deregulation has been more positive than critics of liberalisation would expect.

Most of the evidence in favour of deregulation can be found in the direct measurement of the food security status of the rural poor of South Africa. Here the evidence is clear: everyone in South Africa has, on average, better access to better quality basic services now than 10 years ago. Thus, while it is possible to argue about shifts in relative food security, that debate will take place against the background of an increase in absolute food security.

The report argued that the only way to substantiate this finding was to test the hypothesis that net farm gate prices of agricultural commodities that were controlled would decline and would thereafter rise or fall in real terms according to movements in the world price and the exchange rate, leading to a decline in the total value of output, and a shift in the per capita consumption of these commodities with changes in the retail price. Further, that the total wage bill in agriculture would decrease unless farm workers and workers in related industries could induce farmers to substitute capital for labour, or to pay higher wages, and that the incomes of workers and consumers would depend on the retail price trends. In this regard, the investigation showed that:

- "The deregulation of the two major grain industries … resulted in **sustained lower real farm gate prices** for farmers. These prices have declined in a manner that suggests a link with the process of deregulation[23]. While there has been much talk of the deleterious effects of these lower prices on farmers, the latter have, on average, adapted … Although this has benefited farmers on average, there have also been losers among farmers, and often among the farm workers on these farms.

[23] The NAMC analysis was completed before the recent increases in farm gate prices reported above. However, as these prices have increased as a result of 'movements in the world price and the exchange rate', the hypothesis stands.

- "The real retail price of bread has increased, while that of maize meal decreased. Any evidence of higher consumer prices for grain products has to be ascribed to the lack of competitive conditions elsewhere along the supply chain, and not to factors under the control of the NAMC. However, the potentially negative impact on food security of the higher bread price was mitigated by **a shift in per capita consumption from bread to maize**, which is more readily available to the poorest people in South Africa. Thus, the existence of alternative means of providing food security is an important factor in the maintenance of food security. In this regard, South Africa is more fortunate than many other developing countries.

- "A strong case can … be made that **deregulation in the horticulture sector has had a positive effect on food security, although these benefits have been skewed towards the wealthy and the more skilled workers**.

- "The measurement of the food security effects of deregulation on prices in the livestock industry is made more difficult by the problem of accurately measuring the extent of meat consumption in the country. While the available evidence shows a **link between control and the declining level of per capita red meat consumption**, the case for a link between deregulation and declining consumption would have to wait for estimates of the size of the informal trade in meat.

- "The effect of these changes on consumers is difficult to estimate. There is little evidence that the link between farm gate prices and the retail prices of processed foods is any stronger than at the beginning of the 1990s … In time, as markets begin to function more efficiently in the processing segments of the supply chain, a stronger case could be built for a link between deregulation and more efficient retail prices.

- "There is also some anecdotal evidence of increased small business activities along the agricultural and food supply chain in the field crop, horticulture and livestock subsectors. It is, however, common cause that most of these small business initiatives have been exploited as an extension of existing farming and rural business operations, i.e. few entrepreneurs from previously disadvantaged groups have been able to gain access to these opportunities.

- "The effect of these changes on farm workers is also difficult to estimate. There can be little doubt that the relatively rapid increase in farm worker wages is partly due to the proven ability of farmers to improve their productivity during the process of deregulation. Nevertheless, there can also be little doubt that skilled workers have benefited more than unskilled workers. Some less skilled workers may actually be worse off as employment in those categories declines, and seasonal workers are substituted for permanent workers.

A field survey among poor rural people was also conducted as part of this investigation. The main conclusions of relevance to this study drawn from this empirical evidence was that:

- "The … main source of income of the head of household is a major determinant of the food purchasing power of the household. There were very strong links between increased income and increased food purchases. Types of food purchased at the household level varied by amount and source of income as well.

- "Food purchases varied with (source of) income of the household ... more stable … source(s) of income … resulted in more stable food purchases … Those households with more irregular sources of income also had less regular food purchases.

- "There was good access to food, both in quantity and variety, throughout the areas that were surveyed by the study team. This access is a fundamental aspect of food security.

- "The real price of purchasing the typical basket of food on a household level has decreased (after adjustment for inflation) over the past few years.

- "The cost of purchasing a scientifically determined, nutritionally balanced basket of food is greater than most of the households can afford (or do spend). Whether these baskets are actually being complemented by home produced food is difficult to ascertain.

- "As the majority of the food that was produced at the household level of those surveyed was for own consumption, changes in market prices have had little impact on their income

stream. In those cases where home production was commercialised, it tended to be in products that had not been controlled by the marketing boards, so the deregulation would have had no impact on their income resulting from the sales.

- "Care must be taken in the coming future with respect to the households headed by pension earners as these are quite old and their passing will likely have a critical impact on the households' ability to purchase food, and hence affect their food security.

The implications from the household level survey are that deregulation of agricultural markets in South Africa has been beneficial for food security at the household level. Even though it was impossible to compare the findings of this survey against a baseline, the implications of dropping real prices for food and easy access to food are that deregulation has had a positive impact. The more serious issues to be addressed are the sources and levels of income for the households to be able to purchase the food, as these were ultimately the determining factors behind food security at the household level.

The final conclusion drawn from the analysis is, therefore, that deregulation has helped to make agriculture more efficient, but that it may have worsened the conditions of poor farm workers. There is, as expected, no real evidence that it has affected consumers adversely.

4.1.3 International experience

The research on food price management conducted by IFPRI initially concentrated on analyses of food subsidies and similar government interventions to achieve social purposes by manipulating the prices of staple foods. However, there was some ambivalence about the research because there was a realization that subsidies had adverse economic consequences in the long run, while in the real world they were important because country governments made them so. The challenge, therefore, was to design subsidy systems that would be effective in achieving their social goals and less damaging to long-term economic growth.

The early experience: South Asia

Food subsidy and distribution systems implemented during World War II were retained in some form in South Asian countries, and this provided a base of experience for earlier analyses of the effects of such programs:

- The earliest of these included a study on Kerala, in southern India. Here, the empirical evidence showed that the nutrition status of poor rural people had improved as a result of the programme through a combination of food subsidies and public services in health and education. However, little was said about the cost of the programme.

- The second programme that was studied, also in Kerala, consisted of the forced procurement of a portion of the local rice crop, restrictions on the movement of grain in and out of the state, imports of grain by the state government, and distribution of fixed quantities of grain at specified prices to poor rural and urban people alike. The investigator found that rationing had resulted in a proportionately greater increase in the amount of rice consumed by those with the lowest incomes, that rice procurement reduced income disparities among farmers, that the ration increased consumption among the poor more effectively than a direct income transfer, and that the gains to producers and consumers exceeded the direct cost of the subsidy. However, the study did not account for any efficiency losses that might have to be set off against distributional gains.

- The third study was of price subsidisation and distribution policies in Bangladesh, where the administrative systems were weaker than in India. The results showed that some two-thirds of the food distributed through the subsidized system was going to urban consumers, even though only 9 percent of the population was urban. However, diversion of rationed food to rural areas was politically infeasible, and the provision of equitable coverage in rural areas was expensive. Alternatives proposed included open market sales of food grains when prices increased and the subsidisation of fertilizer prices.

- The last of the earlier studies of subsidies in South Asia was in Sri Lanka, where, despite great poverty, literacy rates and life expectancy were high, and infant mortality low. A system of food distribution to the poor, in place for rice since World War II, was given at least partial credit for this result. In the early stages, the programme was largely self-financed by profits resulting from the difference between low import prices and higher domestic prices (accompanied by an overvalued exchange rate). However, when world prices rose, it became a crippling burden on the budget. While the ration system was an important source of income for the poor, the cost of the programme was questioned, to the extent that the government soon abandoned it in favour of a food

stamp program.

Food stamps were provided to households with declared incomes below specified levels adjusted for family size. The programme was considerably cheaper than the broader food subsidy programme (1% of GDP compared to 3% of GDP). Yet the scheme was less successful in targeting the poor. The food stamps reached only about half of Sri Lanka's households, including most but not all households with per capita expenditures in the lowest quintile.

While the per capita consumption of 75% of the total population either grew or remained constant, the calorie consumption of the poorest quartile declined by 8%. Further, although the stamps allotted to young children had a higher value than those for adults, the additional food consumed by them was less than that of adult members until such time as the latter consumed 80% of their recommended calorie allowance, indicating that it was necessary to provide a relatively large transfer of resources to reach the young in poor households.

Food subsidies in Egypt

By the early 1980s the food subsidy system in Egypt was consuming 10 percent or more of current government expenditures, providing cheap rations to 90% of the population. There was a suspicion of waste, as bread was so cheap it was sometimes used as animal feed. Despite a commitment to food self-sufficiency, the country produced a quarter of its wheat and edible oil consumption. After extensive empirical analysis, the IFPRI research team reached the following conclusions (Alderman and von Braun 1986):

- "The introduction of food subsidies was not an isolated decision … It was rather the outcome of earlier policies to finance industrial growth through implicit transfers of income from producers to consumers. As self-sufficiency in food production declined, a natural transition took place from implicit to explicit subsidies, with the cost transferred from the producers to the government.

- "The budget cost of the subsidies could be measured directly, but an additional, concealed, social opportunity cost arose from the use of an exchange rate below … the free market rate. A further cost arose from the pre-emptive use of foreign exchange for food imports when foreign exchange was scarce or international food prices high. This action diverted resources that would otherwise have been used for the import of capital goods and raw material. By this mechanism, instabilities in the international food markets slowed domestic capacity utilization and overall growth.

- "The rising cost of subsidies contributed to the budget deficits, but was only one factor and could not be held solely responsible for the financial difficulties of the Egyptian government.

- The price distortions caused by food subsidies could not be blamed exclusively for the slow growth of Egyptian agriculture… There were also other factors not related to subsidies that hindered the growth of agriculture such as poor management of the water supply and other inputs, and an inefficient system of agricultural extension.

- "The subsidy system provided widespread benefits to consumers, both urban and rural. Analysis of income transfers through the ration component showed a clearly progressive effect on income distribution. Some elements of the system favoured particular groups more than others, however, and the subsidy of certain commodities with positive income elasticities provided larger income transfers to those with higher incomes.

- "The ration system proper, which provided fixed amounts of flour and/or bread, was reasonably efficient. But the de facto rationing of other subsidized foods through queuing at the cooperatives where they were distributed did have resource costs. These costs should be deducted from the value of the resource transfer.

- "In 1982 about six percent of the wheat supply was used as livestock feed, leading to wastage of the subsidized costs of processing and distributing that wheat for humans. The resulting output of livestock products partially offset this wastage.

- "The Egyptian economy faced difficult choices between current consumption and investment…

Food subsidies in Brazil

During this period, IFPRI also conducted studies in Zambia, Colombia, Mexico, and Brazil. Only the analysis of the wheat programme of Brazil is relevant here. Here the focus was on the attempt to raise producer prices in order to achieve self-sufficiency in wheat production rather than an improvement in nutrition. The results showed that the policy

did not work, principally because the producer price was set below the border price valued at the shadow exchange rate, although above the border price at the (overvalued) official exchange rate, so that the higher price for wheat merely offset the producer price subsidy (Calegar and Schuh 1988, 9). When world wheat prices increased after 1972 and the exchange rate became undervalued, wheat consumption increased rapidly, fuelled by a consumer subsidy. Low-income consumers captured only about 19 percent of the value of the subsidy, and the poorer parts of the country received less than the more affluent regions. Yet it was politically difficult to remove the consumer subsidy, as bread formed an important part of the diet of the poor, and the benefit they received from the subsidy was an important source of income to them. Another problem was the negative effect that the price distortions had on producers of other food crops. The research concluded that the Brazil wheat subsidies were not effective.

Research on food subsidies in the Philippines

IFPRI was involved in the implementation of a pilot study on methods of targeting food studies to poor households with malnourished preschool children in the Philippines in the early 1980s. Fourteen villages in three impoverished regions were identified, and about a third of the households in half of these villages received a subsidized ration of rice and cooking oil, while the same proportion of households in the other villages formed a control group. Both groups were given nutrition education. The pilot study was conducted during a year when the price of rice increased, lowering consumption amongst the control group. However, the consumption levels of the assisted group remained constant.

The results showed that nutrition education only improved the access to food of preschool children and pregnant women when the access to food of the household as a whole improved. Measured by the number of poor households reached, the cost of transferring $1 to a household compared favourably with most other programmes for which costs were known, mainly because existing private outlets were used to distribute the food existing government staff and structures were used to monitor performance.

A synthesis of research on subsidies

IFPRI brought together its work on consumer food subsidies in the book, *Food Subsidies in Developing Countries: Costs, Benefits, and Policy Option*s, edited by Per Pinstrup-Andersen and published in 1988. The following comments on the social and economic effects of consumer food subsidies were made:

- "Subsidies may be implicit, that is, paid indirectly, usually by producers who receive prices lower than a free market would provide; or they may be explicit, that is, paid from the budget; or they may be a combination of the two. Explicit subsidies are of two major types: distribution of foods at prices below the price that would be fixed by the market, or distribution of food stamps that are a form of redistribution of income without direct price effect. Price reductions may be for the total quantity of one or more commodities, or for specified amounts, usually called rations.

- "Price reductions caused by subsidies may be large, but may vary depending on world prices and other factors. Provided that they have access to the subsidized price, reductions in the price of food are relatively more important to the poor, because of the weight of food in their expenditure pattern.

- "The effect on household incomes is positive for those with access to the subsidies, and larger in absolute levels for better-off households. The real effect on incomes is reduced by the natural adjustment of wage levels to compensate for food costs. Incomes foregone because of the financing of the subsidy also need to be considered, but there is no means of making accurate estimates of what these might be. It is usually impossible to identify a specific source of funding for food subsidies within overall government revenue, much less to speculate about the use of and return to marginal resource savings.

- "Food subsidy programmes are commonly intended to improve household food security. They may provide fixed amounts of food, with fluctuating and uncontrolled budget costs, or fixed sums to be used for purchase of food. The latter approach places the burden of price variations on the household, and this remains true for short-term variations even if there is periodic adjustment to take account of inflation. It is very difficult to achieve universal household food security and targeted income transfers in the same program.

- "Income transfers linked to food should increase food consumption among the target population and the research bears this out. The increases in overall consumption are usually not as great as the increases in consumption of the product subsidized, because substitution effects among the poor are larger than expected. Malnourished individuals should also consume more food, but little is known about what actually happens within households, and there is some evidence that adult household members get preference over malnourished children.

- "Targeting is important, because it is a means of reducing costs while concentrating benefits. Few existing programs are effectively targeted on the poor, and many are biased toward urban areas. On the other hand, trying to fine tune targeting beyond a certain point usually produces inefficiency and excessive administrative costs.

- "The degree to which nutrition improves will depend on the extent to which lack of food, rather than sanitation, health, or other factors cause poor nutrition.

- "Reduced food prices can contribute to the formation of human capital by making resources available for health, education, and other services. Studies from non-IFPRI sources suggest that improved nutrition has positive effects on labour productivity. If programs can be designed to achieve such effects, food subsidies may contribute to economic growth rather than detract from it.

- "Fiscal costs of food subsidies rose sharply in the early 1970s, as governments attempted to protect households from the impact of soaring world food prices. Expenditures decreased thereafter because of lower international food prices and government policy decisions. Even so, untargeted, explicit food subsidies for consumers remain expensive. Efforts to save on the cost of subsidies have often harmed the welfare of the poor. Food aid can significantly reduce the cost of food subsidies to the national government

- "The effect of subsidies on the agricultural sector shows no consistent pattern. Explicit consumer subsidies can lead to increased demand for food and, hence, a gain for producers. Implicit consumer subsidies, on the other hand, usually involve low producer prices. It is unclear from existing evidence whether the fiscal cost of subsidies generally leads to reduced investment in the productive side of the agricultural sector.

- **"While it is often argued that subsidies help control inflation by keeping food prices low, deficit financing of explicit subsidies will contribute to continuing inflationary pressures on the general price level which may well overtake the one-time reduction in prices of subsidized commodities**.

- "The impact of food subsidies on trade and foreign exchange depends on the nature of the subsidy program and other existing economic policies. Inflation may contribute to increased demand for foreign goods and subsidy programs themselves can lead to large imports, as in the case of Egypt.

- "Implicit subsidies, by reducing incentives to produce, may depress exports through lower availability of goods to export.

- "Food subsidies can influence employment and economic growth … through price distortions and reduced investment in agricultural and other sectors, through improved human capital, through the effect on wages and inflation, or through the availability of foreign exchange for import of capital goods and raw materials. The net effect on output may be positive or negative … there is no evidence that expenditure on food subsidies impedes or fosters output and growth. The answer hinges on other distortions and accompanying policies.

In the final chapter, the author (Pinstrup-Andersen, 1988) emphasised that subsidies were rarely if ever the solution to long-term problems; on the contrary, they usually made such problems worse. "**Their proper role,**" he argues, "**is to compensate for the effects of inappropriate development strategies, institutional changes, and policy measures". The need for subsidies could be reduced by adopting appropriate strategies, institutional changes, and policies.**

4.2 Conclusions

The lessons from the research on the policy options open to decision makers in the face of increased food prices that has been reviewed here can be summarised as follows:

- There is some justification for targeted food subsidy programmes as a means of providing short-term relief, and the empirical evidence shows that they can succeed in addressing the needs of the poorest.

- However, these programmes face the problem that targeted programmes, while cheaper, require more expertise and better bureaucratic systems to implement. On the other hand, untargeted programmes lead to higher leakage from the system even though they are administratively less complex, and thus less expensive, to implement.

- The food subsidy programmes of the 1970s and the 1980s were introduced within a framework of distorted foreign exchange markets, high taxes on agricultural exports, dirigiste import replacement schemes, etc. In other words, they were to at least partly an attempt to compensate for policy deficiencies in other areas of the economy.

- The experience with structural adjustment programmes in Southern Africa shows that when the market responds it generates unexpected solutions and successes that in their turn make the market work more efficiently.
- However, the market does not always respond to these challenges spontaneously, and concerted effort is required by the private sector and by the public sector to lower transactions costs, promote regional trade, provide market information systems that are expanded to include information on prices across borders, exchange rates, and trade flows.

- The private sector's response to liberalization is sensitive to a broader range of government actions than commonly understood. There is a need for a better understanding of the kinds of incentives that the private sector responds to in order to avoid actions that make 'lack of private sector response' a self-fulfilling prophecy

- The sequence in which domestic and external trade is liberalized matters to the welfare of the poor. As these markets have already been liberalized in South Africa, however, the real lesson lies in the steps that should be taken to alleviate these effects. The evidence generally is that the 'losers' are mainly smallholder farmers who are net food buyers, low-income or wage earners in urban and semi-urban areas, smallholder farmers in remote areas and unskilled farm workers. Policies should be put in place to address production constraints, barriers to market access and non-economic barriers to broad-based economic growth.

- Food security is less of an issue for poor households adversely affected by an increase in retail prices of a staple food commodity when they have access to alternative food staples. In South Africa, for example, poor consumers can readily shift from bread to maize or from maize to bread when the relative retail price shifts. This also means, however, that a subsidy targeted at one of these commodities will interfere with market signals that encourage production of that commodity.

- In the South African circumstances there is evidence that shows that the real price of purchasing the typical basket of food on a household level has decreased over the past few years. Hence the effect of the recent increases, while more visible because it reverses this trend, is not as severe as it would be under different circumstances.

This (partial) review of the literature has identified a wide range of subsidy instruments commonly used for the explicit purpose of controlling the prices that poor people pay for specific food items, and often to control the rate of inflation of food prices. These instruments can generally be divided into implicit and explicit subsidies, and countries generally used both types simultaneously. These subsidies include:

- Food stamps, similar to those long used in the USA;

- Forced procurement, a policy similar to that used in the USSR in the period before the forced collectivisation of agriculture;

- Restrictions on inter-state (provincial) movement of grain, an instrument that was also used in Zimbabwe and Zambia;

- The creation of a monopoly importer, often the State or an agent of the State. In South Africa, most of the Control Boards had monopoly power over imports;

- The creation of (often parallel) distribution systems whose purpose is to supply targeted foodstuffs to the poor at a lower than market price. In its extreme form, this has resulted in special shops for the poor;

- Buffer stock schemes, whereby the state or an agency of the state buys food commodities in time of plenty and sells in times of shortage. The literature on the disruptive effects that these schemes have on producers and consumers is large.

- Conventional food subsidies, such as those used in Egypt and Brazil. In South Africa, a bread price subsidy was part of the Wheat Control Scheme until it was phased out in 1991.

There are three important aspects of the context within which these subsidies were implemented:

- There was a strong belief during the 1970s that world food prices, especially for staples, were increasing, and would continue to increase. It was clear that the poor, except for those who were self-sufficient in food production, would be adversely affected, as this increase would be transferred into the domestic market. Measures to protect the poor from the impact of these price increases were, therefore, justified on political and humanitarian grounds. Later, an economic argument was added, namely that subsidies targeted at the poorest would be beneficial for growth (IFPRI, 1987). However, commodity prices generally, and the prices of staple foods in particular have declined in real terms over the ensuing decades. As will be seen below, the recent transmission of higher food commodity prices into the South African market is a special case.

- There was consensus among analysts and policy makers that the most effective way to increase food production in developing countries was to provide farmers with incentives through higher prices, and with improved technology to lower production costs, and hence to increase their profit margins. However, while such policies would benefit farmers, the landless rural poor and the urban poor would face higher food prices. Interventions in the market to protect these groups were, therefore, justified. Later experience has, however, shown that these groups are only penalised to the extent that higher farm gate prices are transmitted into higher consumer prices.

- The 1970s were characterized by a global fixed exchange rate regime. Higher world prices for staple foods were translated directly into high domestic prices in developing countries that did not have farm price support programmes such as those followed by the industrialised countries. Further, the main problem with agricultural development was the slow pace of growth in food supplies (Mellor and Johnston, 1984).

The analysis in Chapter 2 shows, however, that the South African circumstances differ from this context. **First,** the evidence presented in this report is that the world price of maize and many other basic commodities has increased in the past few months, and is expected to continue increasing. The analysis has also shown that in a liberalized market, these higher international prices are transferred into the domestic market almost immediately. Thus, there may be some justification for intervention by the authorities. **Second,** however, the lack of competition further down the supply chain has had a bigger effect on the prices that poor people pay for their basic needs than has the supply of farm commodities. **Third,** we live in a world characterised by market-determined exchange rates, and the exchange rate has had a bigger and more immediate impact on the South African domestic price of maize than has the world price.

The conclusion is, therefore, clear, namely that **the recent increase in the farm gate price of basic food commodities has come about as a result of a unique combination of five factors**. These are (a) an increasing world price for these commodities, (b) a lack of competition in the supply chain beyond the farm gate, especially at the retail level, (c) a fast and severe depreciation in the value of the currency, (d) a shortage of maize in SADC, and (e) a climate of uncertainty, created specifically by the unfortunate circumstances surrounding the land reform programme and the elections in Zimbabwe, and more generally by the instability in parts of Central and Southern Africa.

While South African farmers have succeeded in increasing total output as a result of deregulation, the production of specific commodities is strongly dependent on the weather. The expectation of a relatively poor maize harvest in South and Southern Africa, coupled with uncertainty caused by the collapse of reason in Zimbabwe, has resulted in the maize price increasing to a level that is close to the import parity price, which has increased because of the collapse in the exchange rate and the higher world price. This has been translated into higher consumer prices for food given the lack of effective competition higher up the supply chain. The implication for decision makers is clear, namely that each of these factors has to be investigated in their own right, and in combination.

4.3 Recommendations

Efficient markets: SAFEX

Under 'normal' circumstances, the combination of increasing world food prices, a poor domestic crop and a collapse in the exchange rate is a rarity. In the case of white maize specifically, however, there is a connection between these factors, specifically because Southern Africa is the only region in the world where large quantities of superior quality (white) maize is grown for human consumption[24]. In an efficiently functioning market, the rapid increase in the South African price for maize would result in one of two market reactions, given that the South African price influences the world price of white maize. **First,** imports of high quality white maize should increase. As this is not available elsewhere, imports of lower quality white maize should increase. However, this is not possible at present, for technical reasons that are summarised in Appendixes 10 and 11. **Second,** in the longer term, i.e. if the shortage of white maize in Southern Africa persists, the increased domestic price, transmitted to the rest of the world, should encourage producers

[24] White maize is grown in Mexico for the manufacturing of *tortilla*, but this does not change the main argument.

in other parts of the world to grow white maize specifically for the South African market. Again, this is not possible for the reasons summarised in Appendixes 11 and 12. However, it appears that a market solution to this problem does exist.

Recommendation 1

For this reason, we recommend that the authorities, in collaboration with the Agricultural Markets Division of SAFEX, should investigate the desirability of introducing a maize futures contract that makes provision for "non African Origin". The desirability of restricting this to farmers in the USA, and of allowing lower quality maize should be included as part of this investigation.

Efficient markets: further down the chain

Our analysis has shown that the poor in South Africa have been adversely affected over the past few months by higher retail food prices, and that the trends in these prices are largely divorced from prices at the farm gate, especially in the case of maize and other staples. Intervention by the state in primary agriculture in South Africa during the 1930s was initiated because of the (perceived) lack of bargaining power of farmers. Deregulation was introduced largely because the farmer support system had become too expensive, and because the benefits were skewly distributed. This does not, however, mean that farmers have automatically gained sufficient bargaining power, as has been proven over the past few months. There is, in fact, an argument that the control mechanisms that were put in place in the 1930s increased the bargaining power of processors, distributors and traders.

Recommendation 2

For this reason, we recommend that the relevant authorities initiate full investigations into the degree of competitiveness in the supply chain for the strategically important commodities that constitute the basic food needs of the poor in South Africa, under the auspices of the Competition Act. Such investigations should include an identification of the barriers to access to markets, including inadequate infrastructure, inappropriate pricing strategies for modes of transport, a lack of communications facilities, etc.

Efficient markets: the farm level

There is little evidence that small farmers have benefited from the new trading environment in agriculture, while there is strong evidence that the efficiency and the fairness of the agricultural sector would be enhanced by a successful land reform and small farmer support programme. As a result, most small farmers in South Africa are still poor, are net food buyers, and are as adversely affected by higher consumer prices for food, as are the landless rural and urban poor.

Recommendation 3

For this reason, we recommend that greater consideration be given to successful land reform and farmer support programmes that result in the creation of successful livelihoods for the millions of current (and potential) farmers from disadvantaged communities who deserve these opportunities. While the plight of the rural poor in South Africa is better now than a decade ago, the agricultural sector has not been allowed to play the important role that it should in the fight against rural poverty. Government needs to reverse the decay in agricultural infrastructure, and refocus efforts in support of poor and disadvantaged farmers.

Alleviating the plight of the poor

It is clear that poor people living in the rural, the urban and the peri-urban areas of South Africa have been most affected by the increase in the farm gate prices of staple foods. Our analysis shows that the consumer prices of these products will not decline in nominal terms in the short to medium term despite the strengthening of the rand and in recent months. Hence, there is an argument for measures to alleviate the plight of the poor.

While we understand the need for remedial action, however, it is clear that South Africa already has mechanisms in place to combat poverty. These include the Public Works Programme, the Primary School Nutrition Programme, and the proposed Comprehensive System of Social Security. Further, experience has shown that specific food subsidies have unintended consequences and, like all subsidy programmes, are difficult to terminate once initiated.

Recommendation 4

For this reason, we recommend that the Government take an in-principle decision not to meet short-term emergencies such as the current rise in consumer prices for basic foods with short-term reactions. The solution rather lies in sound risk management strategies, and properly implemented poverty alleviation policies.

Calculating the CPI

The analysis has shown that considerable effort has been expended in ensuring that the calculation of the CPIF accords with recognised international practices. However, it is clear that the current practice could lead to a misrepresentation of the actual rate of food inflation. It is not clear whether the current practice over- or understates the real rate of inflation in the prices of food products.

Recommendation 5

For this reason, we recommend that StatsSA should give serious consideration to finding a more satisfactory definition of rural areas; that provision should be made for the sale of food products through informal sector outlets in urban and rural areas; and that consideration should be given to including the price trends for food consumption away from the home.

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Appendices

Appendix 1: The first stage of deregulation of agricultural marketing

Scheme/product	First intervention	Main features	Reform process
Single channel fixed price schemes			
General characteristics		Monopoly buyer via appointed agents; monopoly seller to the trade; monopoly importer/exporter; prices fixed in Cabinet on the basis of average cost of production plus a margin for profit; pan-territorial and pan-seasonal prices.	1935:Malie Control Act, Maize Advisory Council appointed, regulation of export of maize. 1938:First Mealie Scheme established under the Marketing Act. 1944/45: Single channel marketing system for maize started. 1953:Establishment of Maize Board Stabilisation Fund
Maize (incorporating grain sorghum)	Mielie Control Act (No.39 of 1931)	Minister had powers to specify the percentage of the crop, which should be exported every year.	Prohibition on the building of grain silos repealed. A change in pricing policy (1987) and the scrapping of price control on maize meal.
Winter cereals (wheat, barley and oats)	Wheat Industry Control Act, 1935; Marketing Act, 1937	Price control exercised at miller and baker level; Government subsidy on bread.	Single channel fixed-price system since 1987 (pricing no longer cost-plus); abolition of registration requirement on millers and confectioners (1990); removal of bread subsidy (1991); price control on flour, meal and bread, and fixing of millers' margins scrapped (1991); government subsidies (high of R1.3bn in 1984) terminated (1992); quantitative import control replaced with tariffs (1995); finally, scheme terminated in 1998.
Single channel pool schemes			
General characteristics		Monopoly buyer and seller via appointed agents; advance payment made to producers and final proceeds paid on termination of the pool; extensive tariff and non-tariff protection against imports.	
Oilseeds (groundnuts, sunflower seeds, soybeans)	Groundnuts (1934); sunflower seeds (1952); and soybeans (1968)	Board selling prices fixed; Oil expressers registered with the Board; South Africa a net importer of oilseeds, thus rent seeking opportunities arose	Abolition of import control over oilcake and fishmeal; groundnuts under a surplus removal scheme (1994/5); finally, scheme terminated in 1998.
Leaf tobacco	Since 1932, in the form of statutory single-channel marketing under the Cooperative Societies Act (Act 38 of 1925)	All producers in a given area were compelled to deliver a specified commodity to their local co-operative (whether they were members or not)	Permits for imports abolished (1990); finally, scheme terminated in 1998.
Deciduous fruit	1939	South Africa a traditional exporter, mainly to Europe (UK and Germany); all functions and powers delegated to a private company (Unifruco); close co-operation with PPECB; only premium grades exported.	Domestic market controls abolished in 1970s; Unifruco and Outspan amalgamate to form Capespan (1995); scheme terminated in 1998
Citrus fruit	1939	South Africa a traditional exporter; all functions and powers delegated to a co-	Domestic market controls abolished (1990); Unifruco and Outspan amalgamate to form Capespan (1995);

		operative (Citrus Exchange, whose operational arm, Outspan, also handled the exports of Swaziland, Mozambique and much of Zimbabwe); close co-operation with PPECB; only premium grades exported.	scheme terminated in 1998
Bananas	1957		Scheme terminated in 1993
Lucerne seed	1952		Controls over imports and exports abolished (1992); scheme terminated in 1998
Wool	1972	South Africa a traditional exporter.	Monopoly right of Board to sell wool rescinded (1993); finally, scheme terminated in 1998
Dried fruit	1938	The Board exercised control over a dying industry without any attempts at revival.	Scheme terminated in 1998
Chicory	1939		Scheme terminated in 1993
Rooibos tea	Clanwilliam Tea Cooperative in 1948. Rooibos Tea Control Board, 1954	Regulating marketing, stabilising prices, improving and standardising quality	In 1993, the Rooibos Tea Control Board was privatised, which resulted to the establishment of the Rooibos Ltd.
Mohair	1965	South Africa a traditional exporter.	Scheme terminated in 1994
Dairy	1956 1961 Dairy Industry Act	Dairy Scheme run as a surplus removal scheme with wide powers of intervention.	Consumer price control on fresh milk abolished (1983); price control over butter and cheese abolished (1986 & 1988 respectively); power to determine transport tariffs, prohibit fresh milk sales, and to manage pools for fresh milk, butter and cheese not used after 1987; Price stabilisation ended after Court ruling ended levy income (1992); Milk Scheme implemented in 1994; Scheme terminated in 1998
Surplus removal (price support) schemes			
Red meat	Meat Trade Control Act, 1932; Marketing Act, 1945	Attempts to stabilise producer prices in controlled areas	Abolition of restrictions of movement from uncontrolled to controlled areas (1992); abolition of restrictive registration of producers, abattoir agents, butchers, dealers, processors and importers (1993); Scheme terminated in 1998
Eggs	1953	Industry moved out of surplus production in the 1980s	Abolition of production and pricing control under the Control of Egg Production Act (1993); Scheme terminated in 1994
Potatoes	1951	Intervention reactive, and had to be quick as a perishable product	Scheme terminated in 1993
Dry beans	1955	Limited intervention	Scheme terminated in 1993
Grain Sorghum	1957	Part of the Summer Grain Scheme up to 1987	Scheme terminated in 1998
Supervisory and price regulation schemes			
Canning fruit	1963	Applicable to canned deciduous fruit only; Enforced negotiations around minimum prices and seasonal contracts; after 1992 no consensus	Scheme terminated in 1998

		reached on minimum prices	
Cotton	1974	Powers of control initially limited to seed cotton; industry internationally uncompetitive	Control powers extended to cotton fibre (1974); Registration of ginners formal (1991); Scheme terminated in 1998
Control in terms of other legislation			
Sugar cane	Sugar Act, 1936	The Sugar Agreement was promulgated in terms of the Act in 1943. Control exercised outside of agriculture (via the Department of Trade and Industry).	The industry has undergone a process of deregulation during the 1990s, but is still heavily protected by tariffs and enjoys more support than any other branch of agriculture.
Wine	1918		KWV, which exercised statutory powers over the industry, began a process of deregulation in the late 1980s, leading to the eventual termination of production quotas and the fixing of a minimum price. KWV became a registered company in 1998, and lost its statutory powers in the process.
Ostriches	1958	Control extended to ostrich products in 1988. Single channel control exercised in terms of Co-operative legislation	Single channel marketing abolished in 1993
Lucerne hay	1958		Single channel marketing abolished in 1993

Appendix 2: Current Arrangements for Marketing Regulations

Commodity	Organisational structure	Source of income	Remaining assets	Imports and exports	*Information*	Research
Maize	Technical Advisory Forum (representing all directly affected groups) Board of Trustees of Maize Trust SAGIS (SA Grains Information Service) Grain SA	Income from Maize Trust	To date a total amount of R 2.64 million was transferred to the Maize Trust. R 20 million was recovered in legal matters that have been finalised. Approximately 275 individual court cases at an estimated amount of R38 million are in various stages of formal litigation. Funds amounting to R 9 million could be collected through an informal process subject to other matters and possibilities. An amount of R 58 million will be settled in instalments. Maize Board Building	Phytosanitary requirements and quality standards should be adhered to, and PPECB certificate for exports Tariff band applicable for imports, currently zero rate	SAGIS, a section 21 Company funded by, amongst others, the Maize Trust Processors and purchasers of grains register with SAGIS, exporters, importers, processors, purchasers and storers keep records and furnish returns to SAGIS. Maize implemented 28/11/97	Financed with income from the Maize Trust and performed by ARC, Universities and other research organisations
Winter cereals	Wheat Forum (representing all directly affected groups) Board of Trustees of Winter Cereal Trust Board of Trustees of	Income from Trusts and levy income R4,00/mt (excl VAT) on wheat processed (research) and R0,50/mt (excl VAT) on wheat, durum, barley or oats	Fixed assets of the Wheat Board transferred to the Winter Cereal Trust	Import (formula) tariff for wheat and wheaten flour Phytosanitary requirements and quality standards should be adhered to and PPECB	Performed by SAGIS and funded by the Trust and levies Processors and purchasers of grains register with SAGIS, exporters, importers,	Financed with income from the Trust and levies and will be performed by ARC, Universities and other research organisations

	Winter Cereal Research and Development Trust amalgamated in 2000 SAGIS SA Grain Laboratory	processed (information.) Published 16/3/98, expired 30/10/98. Payable by processors. B. R4,00/mt wheat processed (research) and R0,50 /mt wheat, durum, barley and oats (information), published on 18/9/98, expires in 2002. Recovered at first point of sale.		certificate needed for exports	processors, buyers and storers of grains keep records and furnish returns to SAGIS. Wheat implemented 30/01/98	
Oilseeds	Grain SA Oilseeds Advisory Committee	Oil and Protein Seed Development Trust	Still waiting for verification from Oilseeds Administrator.	Import tariff Phytosanitary requirements and quality standards should be adhered to and PPECB certificate needed for exports	Is performed by SAGIS and GSA funded by the Trust.	Performed by the ARC and other researchers and financed with income from the Trust
Deciduous fruit	Deciduous Fruit Industry Trust (DFIT) Deciduous Fruit Producers' Trust (DFPT) Fresh Produce Exporters Forum (FPEF)	Statutory levies	Approximately R7,9m used to finance the closing down of the Board and bridging finance for research; remaining funds to be transferred to the DFIT	Free, subject to compliance with quality requirements and obtaining a PPECB certificate Import tariff applicable	DFPT Statutory Levies	Performed by the ARC, Universities and private sector, and financed with income from the statutory levies funds
Citrus fruit	Citrus growers Association (CGA) Citrus Industry Trust	Statutory levy	The remaining funds of the Citrus Board, estimated at between R4 million and R8 million, were transferred to the Citrus Industry Trust	Free, subject to compliance with quality requirements and obtaining a PPECB certificate Import tariff applicable	CGA Statutory levies	Statutory levies: function will be performed by CGA
Lucerne seed	Lucerne Seed Industry Forum (representing all the directly affected	Income from Lucerne Seed Industry Research and Development Trust	Fixed assets of the Lucerne Seed Board (book value R250 161)	Phytosanitary requirements and quality standards should be	Will be performed by the Lucerne Seed Industry Organisation	Performed by ARC and financed with income from the Trust

	groups) Board of Trustees of Lucerne Seed Industry Research and Development Trust Lucerne Seed Industry Organisation (Section 21 Company)		were transferred to the Lucerne Seed Industry Research and Development Trust	adhered to and PPECB certificate needed for exports	and funded by the Trust	
Wool	Wool Forum (representing directly affected groups) Board of Trustees of Wool Trust Cape Wool SA (Section 21 Company)	Income from Wool Trust	Fixed assets of the Wool Board (market value R60 million) were transferred to the Wool Trust	Anybody may import or export freely No tariffs	Cape Wool SA funded by the Wool Trust. The Wool Forum requested for registration, records and returns to enable Cape Wool SA to perform this function	Financed with income from the Wool Trust and performed by ARC, CSIR and other research organisations
Dried fruit	Dried Fruit Technical Services (representing directly affected groups) Section 21 Company	Statutory levies	Remaining funds transferred to DFTS	Tariffs applicable Section 87 import and export control extended until 31/3/1998, thereafter free marketing.	Dried Fruit Technical Services funded by statutory levies	Financed by statutory levies and performed by Dried Fruit Technical services, ARC and other research organisations
Mohair	Board of Trustees of Mohair Trust Mohair SA (Section 21 Company)	Income from Mohair Trust	Assets of the Mohair Board (value R100 million) were transferred to Mohair Trust	Anybody may import or export freely No tariff	Mohair SA funded by the Mohair Trust	Financed by the Mohair Trust and performed by ARC, Universities and other research organisations
Milk	SAMFED (SA Milk Federation) consisting of: Milk Producers' Organisation (MPO) SA Milk Organisation (SAMO)	SAMFED Voluntary contributions	Approximately R199 000 to be transferred to the MPO for funding of research etc	Phytosanitary requirements and quality standards should be adhered to and PPECB certificate Import tariffs	By SAMFED from voluntary levies. SAMO for the secondary sector. MPO for primary sector	By SAMFED from voluntary levies. SAMO for the secondary sector. MPO for primary sector

	National Milk Distributors Association (NMDA)					
Red meat	Meat Forum (representing all the directly affected groups) Board of Trustees of Meat Trust SAMIC (Section 21 company)	Income from Meat Trust	Approximately R50m Meat Board's funds to be transferred to Meat Trust	Different tariff rates	Will be performed by the South African Meat Industry Company (SAMIC), a Section 21 Company funded by, amongst others, the Meat Trust	Financed with income from the Meat Trust and performed by ARC, Universities and other research organisations
Potatoes	Potatoes SA (representing directly affected groups) Board of Trustees	An application for statutory levies to finance research and information is currently being investigated by the NAMC, and a recommendation will be made to the Minister in due course.	Assets were transferred to Trust in 1993 (R22 million)	Phytosanitary requirements and quality standards. PPECB certificate needed for exports	Potatoes SA to be financed by levy	Potatoes SA to be financed by levy
Dry beans	Dry Bean Producers' Organisation Trustees of Dry Bean Trust	Voluntary levies	Not applicable	Phytosanitary requirements and quality standards should be adhered to and PPECB certificate needed for exports	Dry Bean Producers Organisation and financed by Trust	Dry Bean Producers Organisation and financed by Trust
Grain sorghum	Sorghum Forum (representing directly affected groups) Sorghum Trust	R3,10 per ton sorghum, excl VAT, payable by a producer who sells sorghum directly for use or processes sorghum, by a sorghum dealer, feed manufacturer, malt manufacturer, processor, by a sorghum agent or broker, by the importer of sorghum, by an exporter, and by a person who receives sorghum as	The remaining funds of the Sorghum Board, ± R7 million, transferred to the Sorghum Trust	Import tariff. Phytosanitary requirements and quality standards should be adhered to and PPECB certificate needed for exports	Will be performed by SAGIS funded by the Sorghum Trust Processors and purchasers of grains should register with SAGIS, exporters, importers, processors, purchasers and storers of grains keep records and furnish returns. Sorghum implemented 09/ 04/98	Two-thirds funded by the State (ARC), rest from statutory levies.

		remuneration for services rendered or for goods delivered. Published on 08/05/98, lapsed on 31/07/00, extended to 28/2/2002.				
Canning fruit	Canning Fruit Forum (representing directly affected groups) Canning Fruit Producers' Organisation (CFPO) SAFVCA (SA Fruit and Vegetable Canning Association)	Voluntary contributions	Equipment and computers (R46 000) transferred to SAFVCA The Board's share in SAPO and minor obligations transferred. Remaining funds of the Canning Fruit Board (± R600 000) transferred to Infruitec for research	Import tariff. Phytosanitary requirements and quality standards should be adhered to and PPECB certificate needed for exports	CFPO will perform the function, financed though voluntary contributions collected by the four major canners	Infruitec will perform this function, financed *via* voluntary contributions
Cotton	Section 21 Company: Cotton SA (representing directly affected groups) Cotton Trust	12c/kg cotton lint produced, excl VAT, payable by ginners to Cotton SA. Published 08/03/98, lapsed 01/03/00. 14c/kg cotton lint produced, excl VAT, payable by ginners, to Cotton SA. Published on 31 /3/ 2000, to lapse on 31/3/2004	The remaining assets of the Cotton Board, valued at R5 841 754, were transferred to the Cotton Trust The Cotton Board's remaining funds, ± R3 032 761 also transferred to the Cotton Trust	A tariff is applicable on imported cotton, which may, under certain conditions, be rebated	Cotton SA and financed by statutory levies. Registration implemented 08/03/ 98, and records and returns on 09/04/ 98.	Co-ordinated by Cotton SA, financed by statutory levies and performed by ARC (TCRI)

Appendix 3: The history of the CPI

(CPI Manual: Chapter 1: www.ilo.org/public/english/bureau/stat/guides/cpi/index.htm)

Price indices have a long history

- A very early example was the simple index compiled by William Fleetwood in 1707 - it was intended to estimate the average change in the prices paid by Oxford University students over the previous two and half centuries
- Another example = index compiled by the legislature of Massachusetts in 1780 in order to index the pay of soldiers fighting in the Revolutionary War against England
- During 19th century, interest in price indices gathered momentum
- In 1823 Joseph Lowe published a study on agriculture, trade & finance - he developed the concept of a price index as the change in the monetary value of a selected set, or basket, of goods and services, an approach still widely used today, - he also noted the various uses for a price index, such as the index linking wage and rents, and the calculation of real interest
- Lowe can be considered "the father of the consumer price index"
- Later in 19th century further important contributions were made, including those of Laspeyres (1871) and Paasche (1874) whose names are associated with particular types of price indices.
- The Laspeyres index measures the change in the value of the basket of goods and services actually purchased in the earlier of the two periods. In effect, it uses the expenditure of the earlier of the two periods compared to weight the price changes, while the Paasche index uses the expenditure of the later period.
- Marshall (1887) advocated the use of chain indices in which indices measuring price movements from one year to the next are linked together to measure price movements over longer periods of time.
- During the 1920s several important developments occurred
- In 1922, Irving Fisher published "The Making of Index Numbers" - this was prompted by Fisher's interest in inflation and his advocacy of the Quantity Theory of Money.
- A good measure of changes in the price level was needed - that is, a good price index - which lead him into a systematic investigation of the properties of hundreds of different kinds of possible price indices
- Fisher's preferred index, the geometric average of the indices advocated by Laspeyres and Paasche respectively, is now known as the fisher index. It treats the two periods being compared symmetrically.
- The Fisher index remains the preferred index from a theoretical point of view for most purposes
- It can be expected to provide an unbiased estimate of change in the cost of living in most circumstances
- In 1924, Konus published a seminal paper laying down the foundation for the economic theory of the COST OF LIVING INDEX (COL)
- The COL is designed to measure the changes in the cost of maintaining a given standard of living as distinct from maintaining sufficient purchasing power to buy a fixed set of goods and services
- In reality, consumers do not go on purchasing the same set of goods and services over time but adjust their expenditure to take account of changes in relative prices and other factors

In 1926, Divisia index

- It is useful conceptually when actual values, such as household consumption expenditures in the national accounts, have to be decomposed into their price and quality elements
- By 1930, the theoretical foundation for the compilation price indices, including CPIs, had been laid.

Appendix 4: International guidelines for the measurement of the CPI

(CPI Manual, Chapter 1: www.ilo.org/public/english/bureau/stat/guides/cpi/index.htm)

- The Second International Conference of Labour Statisticians convened by the International Labour Organisation (ILO) promulgated the first international standards for CPIs in 1925.
- The original international standards have been revised three times, in 1947, 1962 and 1987, each revision being approved by the International Conference of Labour Statisticians.
- The present Manual contains a much more extensive, detailed and up to date discussion of both the theory and practice of consumer price indices. It also contains the draft resolution for the fourth revision of the international standards submitted to the XVIIth International Conference of Labour Statisticians in 2003.

- <u>The current revision</u>

- The revised and updated standards presented in this manual have been developed in response to several factors
- Work on the methodology of price indices, covering both theoretical issues and optimal methods of calculation, was undertaken at an international level during the 1990s as a result of the formation of the *International Working Group on Price Indices* (established under the auspices of the United Nations Statistical Commission, met for the first time in Ottawa in 1994 "Ottawa Group")
- Another factor is the high priority accorded to the control of inflation as a policy objective in most countries, after the experience of high, or even hyper, inflation in the last three decades of the 20th century

- CPIs are subject to an upward bias - result of their failing to make proper allowance for improvements in the quality of many goods and services, especially newer goods such as computers subject to rapid technological progress
- The cumulative effects of even small potential biases can have considerable financial consequences for government budgets over the long term
- Within the EU the convergence of inflation was deemed to be an important prerequisite for the formation of a monetary union. This required precisely defined price indices that are comparable between countries. This work culminated in the elaboration of a new set of international standards for the 29 member and candidate countries of the EU and lead to the development of the EU's *Harmonised Indices of Consumer Prices (HICPs)*.

- Responsibility of the International Agencies
  - All the international agencies concerned with general economic policy now attach importance to the CPI and its movements (as result of experience of inflation in the last three decades). In addition the International Labour Organisation, the International Monetary Fund, the World Bank, the regional Economic Commission of the United Nations, the Organisation for Economic Cooperation and Development and the Commission of the European Union all have a strong interest in CPIs. All of these agencies have provided technical assistance in the compilation of CPIs to countries in transition as well as to developing countries. The agencies have therefore agreed to pool their resources and collaborate in the present revision of the CPI Manual, establishing an Inter-Secretariat Group to manage the process.

- Specific Issues (www.ilo.org/public/english/bureau/stat/guides/cpi/revguid.htm)
  - The recent emergence of economies in transition & movements towards free market economies of many developing countries has raised new issues with respect to CPI measurement. Economies in transition are quite dynamic with a lot of peculiar problems. Many new products are introduced all the time, while others leave the market. Also there are big and frequent quality changes in the existing products, and changes in the relative prices of goods and services in response to changes in consumer demand. All this imposed the need for finding new methodological solutions for observing prices and calculating the price index.
  - Eurostat has developed procedures and standards for a Harmonised Index of Consumer Prices (HICP)
  - In the United States the Boskin Report has created an enormous amount of interest. It identifies possible sources of bias in the CPI like substitution bias, retail outlet substitution bias, quality bias, new goods bias. This report has called into question the accuracy and relevancy of the consumer price index even when international standards are followed.
  - CPI may overstate the rate of inflation. Among countries in which major research projects have recently been undertaken to investigate possible upward bias in the CPI are Canada, UK, France and Australia.
  - Other issues that have arisen include the need for constructing and publishing more then one index that will meet specific requirements, because no single index can serve all purposes without having conceptual short-comings for some or all of them, also the question of computing separate CPI for different population groups.
  - There is now a raised awareness of the need to review:
    - The formula utilised
    - The frequency, comprehensiveness and quality of household surveys
    - The procedures for quality adjustment, introduction of new goods and new outlets
    - The usage of probability sampling methods, etc.;
    - The use of a single index to serve various objectives;
    - The demand for sub-population indices; etc.;

Appendix 5: Weights and sources of weights

(CPI Manual, chapter 17: www.ilo.org/public/english/bureau/stat/guides/cpi/index.htm)

Role of the weights

- As some items are more important than others in the sense that more money is spent on them by the consumer, each item is given a "weight" to represent its relative importance in the average household's total expenditures during the reference period for the weights.
- To arrive at the aggregate index figure the price relatives of the individual products are multiplied by these "weights" to derive a weighted average aggregate index.
- The weights determine the impact that a particular price change will have on the overall index.

Consumption expenditure and weights

- In the ICLS (1987) CPI resolution it is observed that households' consumption expenditures should usually be used as the basis for the derivation of weights.
- This is also the practice followed in the construction of most national CPIs.
- Consumption expenditure can be measured in terms of "acquisition", "use", or "payment".
- For an index generally defined as a statistical measure of the average changes in prices of consumer goods and services purchased by the index population, consumption from own production, goods received as income in

kind and goods and services supplied free of charge, are outside the scope of the index as there are no prices directly linked to the item for the consumer.
- Prices that cannot be directly or satisfactorily measured are also excluded.
- If the national CPI is used as an indicator of price movements for the entire country, the population weights should be estimated from information which cover all households residing in any part of the economic territory, regardless of their income.
- If country uses national accounts estimates as basis for CPI weights, institutional households (mental hospitals, army) are included; if household budget surveys are used as basis for estimating CPI weights, institutional households are excluded.

Contents of the CPI basket
- The CPI basket is meant to contain the goods and services that fall within the scope of the index and which are important to the reference population.
- Due to practical difficulties, it is not possible to include all goods and all services in the CPI basket.
- Therefore, it is necessary to determine what goods and services should be selected so that the index reflects price changes for a much wider range of goods and services than is actually priced.

Treatment of unimportant expenditures
- In general the CPI is required to cover all expenditure groups in the classification used.
- Once the percentage shares for each group are calculated, it might be decided, for example, to exclude groups with weights lower than 0.1 percent (for food groups) and 0.2 percent (for non-food groups).
- The lower minimum threshold for the food items might be set because the prices for these items tend to display greater variability and that prices for food items are normally less expensive to collect.
- In case some expenditure groups are excluded their weights should be distributed across those that were selected, or they should be assigned to the related groups.
- A similar procedure would also be applied to products that have a tiny share of the expenditure in the market basket or are difficult to define in terms of specifications and price characteristics.
- However, certain items due to their significant nature should be included even though they have a very low share of expenditure.

Classification issues
- For the purpose of applying the weights, products are grouped with other products, either because they have a common end-use or because they are considered substitutes for each other.
- These families of products are joined together at different levels to form a hierarchy in a classification system.
- To the extent practical, for the purposes of international comparison, the classification scheme of goods and services should be in line with classification of individual consumption according to purpose (COIOP), the most recent version which was approved by the UN Statistical Commission at its 30th Session in March 1999.
- To facilitate estimation and application of weights it is also desirable that the classification used be consistent with the classifications used for household expenditure surveys and other statistics (foe example retail statistics).
- Each product selected for inclusion in the CPI basket is assigned a product code in accordance with the classification system.
- Sub-indices are computed by combining product indices, according to the classification system.
- These sub-indices are further aggregated following the hierarchy of the classification to arrive at major groups or divisions, and finally, the "All-items" index.
- It is necessary to determine what goods and services should constitute each class of the CPI. Each expenditure class has to be represented by selected goods and services that are considered representative for their class.
- The price changes of these particular goods and services are then monitored and their weight average is subsequently used as a measure of price changes for that class.

Aggregation
- Aggregation starts with the sample of specific product prices collected from particular outlets in particular areas
- The prices or price relatives are combined using the price index formula to arrive at the first level of index aggregation (the elementary aggregate or elementary aggregate index)
- The elementary aggregate index covers all prices collected for one product in one stratum.
- Stratification may be by region, by shop type, by both or neither.
- For most items, particularly food, a large number of prices are collected from great number of different shops in different areas of the country. These prices vary considerably. The experience of many countries suggests that the type of outlet is the most important factor associated with difference in prices for the same item. Very often there might be significant regional variations as well.
- Once price indices for the elementary aggregates are computed, the item indices are obtained as weighted combination of the indices for each elementary aggregate

- Then the item indices are combined following the hierarchy of the classification, with appropriate weights applied along the way.
- Depending on the formulae used, the bases of the weights differ
- The geometric mean assumes that the expenditure shares of each item within the elementary aggregate are the same in each period
- The ratio of arithmetic mean prices assume equal quantities in both periods, and
- The arithmetic mean of price relatives equal expenditure in the first period.

Elementary aggregate, item and section weights

- Once the content of the basket has been determined, the weights should be derived. The data used to derive weights comes from a variety of sources.

Explicit and implicit weights

- If, all prices relatives within the elementary aggregate are equally important, a formula giving equal importance to all price relatives should be used. The ratio of average price formula assumes that the importance of each observation is proportional to its base price. This latter approach makes the strong assumption that expenditure values are proportional to the base prices. In the ratio of average price formula, transactions with higher prices receive more importance than those with lower prices.
- Another alternative formula is the geometric average. The geometric average of price relatives and the ratio of geometric average prices yield the same result. The use of this formula assumes that the weight of each observation is equal to its share of base period value (not its share of base period quantities). Thus, as relative price change, the assumption is made that there is an inverse relationship between the change in price and the quantity produced consistent with a unitary quantity produced. This assumption about the inverse relationship between price and quantity may not be valid for all expenditure groups (for example medicaments).

Sources of weights

- Household Budget Survey
- National accounts
- Population censuses
- Other surveys
    - National Food Survey
    - Points of purchase surveys

Weight reference period

- The weight reference period is the time period, often a single calendar year, to which the estimates of the value of consumption relate.
- The weight reference period and the price reference period used in the index formula should refer to the same period.
- The weights may be chosen from multiple periods depending on the formula that is used to calculate the index. It was recommended that a symmetric index be used which requires weights for the base period and the current period.
- The weights that are used refer to a single calendar year. If a single year's data is not adequate, an average of several years' expenditure data may provide the best base as it reduces the sampling and seasonal variance of the consumer expenditure data for a given size of the annual sample.
- During the periods of high inflation, multiple year weights should be calculated by averaging value shares rather than averaging actual value levels.
- For seasonal products, it may be preferable to develop separate weights by month.

Plutocratic and democratic weights

- To construct an aggregate price index for a population some method of aggregation has to be used to "average" the effect of price changes on all households in the population.
- This aggregate index may be computed with the weights which reflect average expenditures of reference households or the expenditure of an average household.
- In most, if not all countries, the CPIs use weights that reflect the composition of the estimated aggregate values of the reference population. This means that each household contributes to these weights by an amount proportional to its expenditure. Such weighing has been named "plutocratic".
- The second type of weighing, which gives equal importance to all households by averaging consumption values, is named "democratic".

Appendix 6: Historical changes in CPI-food weights

(Gerald E. Schulte, Food Cost Review, 1950-97, Economic Research Service/USDA)

- The CPI for food is probably the most widely used measure of change in food prices.

- A reliable estimate of change in overall food prices allows both economists and policy analysts to split estimates of the changes in consumer food spending into two components
  1. changes in actual consumption of food and food-related services, and
  2. changes in prices paid for food and food related services.
- Analyst who construct the CPI index numbers do so by choosing representative consumer items to represent various classes of consumer spending
- The prices of these representative consumer items are weighted by their shares in consumer spending
- A review of changing weights = not a simple evenly evolving story
- CPI weights are based on changing consumer spending patterns and thus are subject to periodic revisions.
- CPI-Food in CPI-U
- As an economy's per capita income grows, its consumers normally spend a smaller share on essentials such as food
- This expected behaviour appears in the CPI-Food weights and is reflected in a downward trend for the CPI-Food weights as a percentage of the CPI-U index.
- CPI-Food-at-Home vs. CPI-Food-away-from-Home
- The effects of rising affluence are not the only factors responsible for decreasing the share of consumer spending on food
- The rise in two-income households, the share of women in the workforce, and time constrains associated with modern lifestyles also have changed the nature of consumer spending on food
- The picture that emerges from an examination of recent historical CPI-Food weights is of food accounting for a shrinking share of consumer spending, but more of this spending is for food away from home.

Appendix 7: Changes in the formula for calculating the basic components of the CPI

(Bureau of Labour Statistics: October 1998, Industrial Relations, Vol.37, No.4)

- Significant changes made within the past few years have been designed to eliminate a bias associated with the introduction of new items into the index, better capture price changes associated with the introduction of new prescription drugs, better reflected patterns of treatment received by hospital patients, and better capture the actual (quality-adjusted) prices of personal computer equipment.
- NEW FORMULA = a geometric mean estimator
- Based on BLS research, the new formula will reduce the annual rate of increases in the CPI by about 0.2 percent per year
- Research strongly suggests that the use of the geometric mean estimator at the basic level of index construction in the CPI will produce a measure that more accurately reflects the impact that changing prices have on the average US household
- One motivation was the problem of functional form bias then presented in the CPI. "Functional form bias" occurred when using observed expenditure information to estimate the quantity weights used in the index formula. Because the geometric mean formula does not require quantity data, it does not suffer from this problem
- In contrast to the fixed quantity weights of the current CPI formula, the geometric mean estimator employs a set of fixed expenditure proportions as weights for average prices of items within a CPI basic index. Fixing relative expenditure proportions rather than relative quantities implies that consumers can alter the quantities of goods and services they buy, albeit within the narrow range of a CPI category, when the relative prices of those goods and services change.
- The geometric mean formula will be used only to average prices within the item-area strata. Consequently, the geometric mean formula will address only the issues of substitution within strata.
- Substitution can take several forms:
  - Substitution among brands of products, e.g. between brands of ice cream
  - Substitution among product sizes, e.g. between pint and quart packages of ice cream
  - Substitution among outlets, e.g. between a brand of ice cream sold at different stores
  - Substitution across time, e.g. between buying ice cream during the first or second week of the month
  - Substitution among types of items within a category, e.g. between ice cream and frozen yoghurt
- Note, however, that substitution across categories, such as between ice cream products in general and apples in general is not addressed by the geometric mean formula

Appendix 8: Comparative CPI Methodologies

Country	Sampling &Weights	Re-base of Index	Price Collection	Index Formula
South Africa	Survey of Income and Expenditure of Households (conducted every five years) Geographical sample for price collection - includes 13 major metropolitan areas, covering all nine provinces, "other urban areas" are covered by nine provincial samples of four to five urban areas each, therefore, and a total of 39 "other urban areas" is sampled. Retail trade and service sampling frame for each of the 53 sampling areas. (The sample of outlets is revised every five years when the weights are revised.)	Every five years	An average of 110 000 price quotations are collected each month from approximately 2 200 outlets by means of 6 700 questionnaires. The indices are based on retail trade and service prices. Price information refers to the first seven days of the relevant month. The prices of all items include VAT.	Laspeyres formula in which fixed weights are used to aggregate basic product indices to higher group indices and the total.
United Kingdom	Annual UK Family Expenditure Survey	Once every Year	Domestic prices are colleted by the private sector company Research International. Prices are collected on the second or third Tuesday of each month, although for some items prices are collected a day on either side of that day. In addition, data are collected by ONS staff from some major suppliers. Prices include taxes such as council tax; VAT, duties, vehicle excise duty, insurance tax and airport tax.	Annually chain linked Laspeyres index
Canada	Information on the spending habits of Canadian households is obtained periodically from family expenditure surveys. Nearly all Canadian urban and rural households. In one survey, households selected from random sample are asked to keep a detailed diary of food expenditure over a two-week period. In the other survey, the randomly selected households are asked to provide detailed information on what goods and services were purchased in the previous calendar year together with the amount of money spent on these items.		The prices used in the CPI are those that any consumer would have to pay on the day of the survey. This means that if an item is on sale, the sale price is collected. Prices are collected for over 600 separate goods and services. Most commodities are priced once a month. Some items are priced each quarter. Property taxes and tuition fees are monitored once a year. Generally, the more often prices change, the more often they are collected. When prices change outside the scheduled time of collection, a special price collection may be carried out to ensure that such changes are reported in the CPI in a timely fashion. The pricing cycle starts in the first week of each reference month and extends to the third week of the month.	

Hong Kong	Household Expenditure Survey (updated every five years)	Every five years	Price data are collected mainly by field visits, supplemented by telephone and postal enquiries. On average, about 10 000 visits and 1 300 telephone calls are made to some 4 000 retail outlets and service providers each month to collect about 45 000 price quotations.	
Japan	2000 average of the Family Income and Expenditure Survey (updated every five years) For fresh food, monthly weights are calculated from not only the expenditure by item, but also the quantity purchased of each month for the entire year. (The total weights for three categories of fresh food - i.e. fresh fish and shellfish, fresh vegetables, fresh fruits - are fixed throughout the year.)	Every five years	The index covers 596 items. The prices of the items are collected in the monthly Retail Price Survey in principle. In this survey, prices are surveyed once a month in principle, but the prices of fresh food and cut flowers are collected three times a month as their prices sharply fluctuate day by day. Approximately 233 000 price quotes are obtained each month from 31 000 establishments and 22 000 rental units.	Laspeyres formula
Uganda			Price data collection for all goods and services is carried out on monthly basis for all centres. The collected price data is carefully examined for accuracy and validity before it is used for CPI calculations.	Modified Laspeyres formula
Chile	Household Budget Survey Point-of-Purchase Survey	Used to be every ten years, in 1998 it was suggested to re-base every five years.	The type of prices used corresponds to the sale price to the final consumer. This price corresponds to the cash price, including VAT and other taxes. The period is the month. The frequency of collecting prices will be monthly, with the exception of the group Food and Beverages, and some fuels of high variability, for which prices will be collected weekly.	Laspeyres formula
Malaysia	Household Expenditure Survey (conducted every five years)	Every five years	The index covers about 430 items. Each month approximately 100 000 price quotes are obtained from about 19 000 retail outlets throughout the country. Prices are collected monthly, except for prices on rental property which are collected on a quarterly basis.	Laspeyres formula
Mozambique	Household Budget Survey Point of purchase survey		The price collecting zones are grouped in 7 circuits where each circuit is visited approximately at the same time (same week)	

			every month. Markets are still visited every week. The outlets in some of the circuits are widely spread and can only be reached by car. According to Maputo Central, some types of non-food outlets are almost absent within a circuit and replacement will be hard to find if a particular outlet is permanently closing down. Maputo Central should reconsider the circuits and if lack of recourses should be taken into account, try to concentrate the outlets within a specific circuit.	
New Zealand	Household Economic Survey (updated every five years) Outlet weights are used, as it is not practical to survey every outlet and are based on the proportion of sales by outlet type and/or market share.	Every five years	Prices are surveyed for all the goods and services selected for the Food Price Index. This generally takes place in the main urban areas. Prices are collected in a wide range of outlets since most items are sold in more than one type of outlet. For example an apple, from a fruit and vegetable shop, a supermarket or a dairy. The rate of price change will usually vary between these outlets. Household Expenditure Survey and retail trade data are used as a guide to determine which outlets to price survey for a particular commodity.	Laspeyres Price Relative Index Formula, this formula produces the same results as the basic Laspeyres formula but means that expenditure data from the Household Economic Survey can be used directly in the index formula.
Ireland	Household Budget Survey & estimates of expenditure by tourist across a range of consumer goods and services		Personal visits are made to retail outlets by some 200 part-time pricers on a monthly basis. Approximately 51 000 price quotations are gathered in this way. In addition 112 special inquiries covering items such as utility charges and services are conducted by post and telephone. Most prices are collected monthly, some quarterly and others annually. The Central Statistics Office supplies general specifications to price collectors and collectors are free initially to select a brand of the same item to be priced throughout the country. Once selected, the same item/brand is priced on a monthly basis in order to ensure matched price quotations. If an item disappears, substitution can occur but that price is excluded until matched prices are	Laspeyres formula

			available for the same comparable item for two consecutive months.	
Korea	The weights of index items are calculated on the basis of average expenditures per household obtained from the FIES. The FIES covers all households excluding farmers' and fishermen's households and one-person households, and is conducted monthly in a sample of 5500 households in 36 cities.		The prices obtained by the price collectors are normal prices (actual transaction prices) excluding abnormal prices such as: - Temporarily irregular prices caused by disaster or similar condition - Discounted prices due to volume purchases - Prices of second-hand articles and goods that are sold on an instalment basis	Laspeyres formula
Philippines	Family Income and Expenditure Survey Commodity and Outlet Survey	No fixed interval for rebasing, so far: 1966, 1972, 1978, 1988, 1994, 2000	The survey covers about 9500 outlets nationwide with about 415 138 price quotations obtained monthly. Price collection for food is carried out weekly in 9 markets.	Variant of the Laspeyre's Formula with fixed base year period weights
Turkey	Household Income and Expenditure Survey	Every five years	The index covers 410 items. Approximately 100 000 price quotes are obtained each month, from 6390 outlets in the 7 regions. Prices are collected twice each month (four times each month for vegetables and fruits). The prices include any relevant taxes	Laspeyres formula
El Salvador	Urban Household and Expenditure Survey	No fixed schedule for re-basing, currently = 1992, previous = 1978	Every month 1 124 establishments and 3 424 prices are surveyed. Prices of most items are surveyed monthly, but some relatively stable prices are surveyed only once every second month or once a quarter. The price measured are inclusive of value added tax.	Modified Laspeyres formula
Finland	National Accounts	Every five years	The index covers 492 items and is based on actual prices paid by consumers. Therefore, it includes all taxes and duties.	Fixed base Laspeyres formula
India	Family Income and Expenditure Survey	Efforts are made to update the weights every ten years. However, due to various reasons, this	The index covers 260 items, and approximately 160 000 retail price quotes are obtained each month from 16 545 outlets and selected open markets. About 81 percent of the price quotes	Laspeyres formula

		schedule could not be adhered to. The latest update of the CPI weights was done in 1981-82, after a gap of 22 years.	are collected every week for price sensitive items. Prices for some commodities (about 18 percent) are collected on a monthly basis. Prices of items such as house rent, school or college fees and school/college books (I percent of price quotes) are collected every 6 months. The price quotes include all tax.	
France	Weights are derived from national accounts final consumption data of the antepenultimate year		Prices are collected through the month using stratified sample surveys. They are collected for 159 groupings (with 303 sub-groups, more than 1000 products are observed, and 150 000 quotations are collected each month).	Annually chained Laspeyres-type index
Peru	"Encuesta Nacional de Propósitos Múltiples"	The index base has been moved from 1994 to 2001	Approximately 40 000 price quotes are obtained each month from 41 markets, 5 Supermarkets, 500 rented homes, 505 educational centres, 210 urban and interstate transport lines, among others. The prices are collected in different frequency depending on the type of goods: prices of products sold in retail outlets are collected every Thursday and Saturday; prices of products sold in other outlets and prices for leasing costs are collected once a month; and prices for public services are obtained every time the tariffs are changed by the enterprises that provide such services.	Laspeyres formula
Ecuador	Survey of Incomes and Expenses of Urban Homes		Prices are collected weekly, semi-monthly, and refer to the last week of the previous month and the first three weeks of the reference month. The survey includes 2 450 outlets and a total of 11 500 prices are collected. The prices include VAT and other sales taxes.	Chained Laspeyres formula
Italy	The weights are represented by values of final household consumption as derived from the National Accounts. These values are then corrected on the basis of other information derived from the Households Budget survey and from other sources.		Prices are collected monthly with the exception of durables, semi durables and rents (quarterly) and seasonal goods (twice a month). The price quotations refer to a group of approximately 1000 products classified accordingly to the COIOP'95 Rev. 1 classification. The CPI is based on approximately 300 000 price	Laspeyres type index

			quotations each month taken at 26 000 sales outlets and 12 000 households.	
Brazil	Household Budget Survey	The index compilation process and its methodology is being constantly improved, therefore there is no index re-base on a regular basis. The weights were revised in 1989 and in 1999 and the next revision will be in 2003/2004.	The collection of prices and goods and services is continuous throughout the month and is carried out by special teams of approximately 300 field researchers. The systematic collection of prices follows a schedule established each year, in which each month is divided into four periods, approximately to one week each. The samples are also divided into four parts, and each part includes a fixed set of establishments that is always visited during the same period of each month. The general rule is that the prices of each product are collected each month. Information is collected annually for taxes, the amount of which are set once a year.	Laspeyres index

Appendix 9

Group/Item	Expenditure group															
	Total		Very low		Low		Middle		High		Very high		Pensioners		Core	
	1995	2000	1995	2000	1995	2000	1995	2000	1995	2000	1995	2000	1995	2000	1995	2000
Food	18.02	25.44	40.73	57.58	34.39	54.91	31.12	46.5	25.42	34.28	14.84	16.68	21.06	35.43	12.55	27.96
GRAIN PRODUCTS	3.31	5.44	12.6	17.88	9.13	16.82	7.61	12.41	5.2	7.46	2.37	2.62	4.05	8.61	4.33	5.99
White bread	0.69	0.96	1.53	1.26	1.65	1.75	1.55	1.91	1.18	1.68	0.49	0.57	0.82	1.11	0.9	1.07
Brown and whole-wheat bread	0.43	1.12	2.42	3.52	1.94	3.73	1.44	3.07	0.67	1.72	0.25	0.41	0.6	1.85	0.56	1.26
Other bread and bread rolls	0.1	0.08	0.02	0.02	0.05	0.03	0.07	0.04	0.1	0.06	0.1	0.1	0.08	0.08	0.13	0.09
Cake flour	0.27	0.29	0.79	0.59	0.65	0.81	0.64	0.69	0.45	0.44	0.19	0.14	0.3	0.49	0.36	0.31
Bread flour	0.13	0.18	1.16	1.27	0.5	1.03	0.25	0.51	0.31	0.18	0.06	0.03	0.14	0.45	0.17	0.19
Breakfast oats	0.07	0.04	0.06	0.02	0.04	0.04	0.07	0.05	0.09	0.05	0.07	0.03	0.09	0.05	0.1	0.04
Corn flakes/breakfast cereals	0.23	0.23	0.18	0.03	0.13	0.08	0.23	0.14	0.28	0.26	0.23	0.25	0.3	0.21	0.31	0.25
Mealie meal	0.38	1.16	3.33	7.87	1.96	5.95	1.37	3.32	0.65	1.23	0.2	0.24	0.51	2.37	0.5	1.27
Mealie rice/samp	0.11	0.16	0.67	0.82	0.45	0.71	0.27	0.42	0.17	0.19	0.07	0.05	0.15	0.34	0.14	0.17
Rice	0.37	0.65	1.74	2.04	1.28	2.1	1.02	1.57	0.64	0.91	0.23	0.29	0.49	0.99	0.48	0.71
Spaghetti, macaroni and other pasta	0.18	0.18	0.37	0.07	0.17	0.11	0.18	0.16	0.2	0.22	0.18	0.18	0.21	0.17	0.24	0.2
Biscuits	0.13	0.12	0.04	0.05	0.09	0.05	0.13	0.1	0.14	0.14	0.12	0.12	0.13	0.12	0.16	0.13
Rusks	0.01	0.01	0	0	0	0	0.01	0	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cake, tarts, pies and other baked prod.	0.04	0.04	0.02	0.02	0.03	0.02	0.04	0.04	0.05	0.05	0.04	0.04	0.05	0.04	0.06	0.05
Other grain products	0.17	0.22	0.27	0.3	0.19	0.41	0.34	0.39	0.26	0.32	0.13	0.16	0.17	0.33	0.21	0.24
MEAT	5.33	6.44	9.77	9.51	9.16	9.93	8.32	10.09	7.53	9.02	4.47	4.86	6.07	8.08	0.06	7.07
Fresh - beef and veal	1.22	1.09	2.68	1.84	2.72	1.95	2.2	2.01	1.9	1.64	0.95	0.17	1.4	1.33	0	1.19
Fresh - mutton and beef	1.19	1.84	1.46	1.41	1.3	1.68	1.54	2.07	1.79	2.44	1.02	1.68	1.33	2.24	0	2.03
Fresh - pork	0.37	0.22	0.34	0.27	0.44	0.3	0.35	0.24	0.32	0.26	0.39	0.2	0.4	0.27	0	0.24
Fresh - poultry (including frozen)	0.96	1.67	2.83	4.59	2.27	4.24	1.9	3.66	1.35	2.48	0.76	0.88	1.16	2.47	0	1.83
Fresh - boerewors	0.41	0.54	1.05	0.55	0.82	0.8	0.89	0.91	0.66	0.83	0.31	0.39	0.53	0.62	0	0.6
Fresh - other sausage	0.08	0.22	0.15	0.08	0.09	0.13	0.08	0.21	0.1	0.3	0.07	0.21	0.1	0.22	0	0.24
Bacon	0.11	0.12	0.05	0.04	0.1	0.04	0.06	0.08	0.11	0.12	0.11	0.14	0.13	0.13	0	0.13
Ham	0.04	0.02	0.01	0	0.01	0.01	0.04	0.02	0.05	0.03	0.03	0.02	0.04	0.02	0	0.02
Other cold meat	0.21	0.18	0.06	0.04	0.09	0.08	0.23	0.15	0.31	0.25	0.19	0.18	0.22	0.18	0	0.2
Other meat and meat products	0.74	0.54	1.14	0.69	1.32	0.7	1.03	0.74	0.94	0.67	0.64	0.45	0.76	0.6	0.06	0.59
FISH AND OTHER SEAFOOD	0.08	0.72	0.87	0.93	1.12	0.98	1.03	0.99	1.05	0.87	0.7	0.61	0.9	0.83	0.19	0.79
Fresh or chilled	0.31	0.28	0.27	0.15	0.41	0.23	0.39	0.32	0.45	0.36	0.27	0.26	0.4	0.33	0	0.31
Frozen	0.07	0.18	0.05	0.06	0.07	0.08	0.07	0.13	0.08	0.19	0.06	0.21	0.07	0.19	0	0.21
Smoked, dried and salted	0	0.02	0	0.02	0	0.02	0	0.02	0	0.03	0	0.02	0	0.02	0	0.02

Tinned fish	0.13	0.2	0.32	0.66	0.34	0.6	0.29	0.48	0.17	0.25	0.1	0.08	0.14	0.25	0.17	0.21
Fish paste	0.01	0	0.03	0	0.04	0	0.03	0	0.02	0	0.01	0	0.02	0	0.02	0
Other fish	0.28	0.04	0.2	0.04	0.26	0.05	0.25	0.04	0.33	0.04	0.26	0.04	0.27	0.04	0	0.04
MILK, CHEESE AND EGGS	1.9	2.2	3.29	3.62	3	3.96	3.03	3.71	2.56	2.97	1.68	1.6	0.17	2.82	2.46	2.42
Fresh milk	0.76	0.75	1.62	1.03	1.12	1.11	1.12	1.13	0.97	1.05	0.67	0.58	0.88	0.92	0.98	0.83
Cheese	0.29	0.24	0.05	0.02	0.17	0.06	0.26	0.14	0.32	0.27	0.28	0.28	0.31	0.26	0.37	0.27
Condensed/evaporated/sterilized milk	0.13	0.15	0.15	0.33	0.26	0.31	0.2	0.22	0.17	0.18	0.11	0.11	0.16	0.26	0.17	0.16
Milk powder	0.11	0.09	0.32	0.26	0.28	0.28	0.26	0.24	0.19	0.13	0.08	0.04	0.14	0.14	0.15	0.1
Other milk products, including creamers, whiteners and mixtures	0.29	0.53	0.57	0.9	0.42	1.05	0.53	0.98	0.41	0.7	0.25	0.36	0.29	0.66	0.38	0.58
Eggs	0.32	0.44	0.58	1.08	0.75	1.15	0.66	1	0.5	0.64	0.29	0.23	0.39	0.58	0.41	0.48
FATS AND OILS	0.85	0.93	2.06	2.31	1.86	2.12	1.66	1.8	1.31	1.31	0.66	0.56	1.02	1.32	1.12	1.18
Butter	0.19	0.11	0.48	0.1	0.36	0.11	0.31	0.12	0.3	0.14	0.15	0.1	0.21	0.13	0.24	0.14
Fats	0.03	0.04	0.09	0.15	0.08	0.1	0.05	0.07	0.04	0.05	0.02	0.02	0.03	0.05	0.04	0.05
Cooking and salad oil	0.26	0.39	0.86	1.55	0.73	1.27	0.59	0.91	0.41	0.53	0.19	0.18	0.31	0.61	0.34	0.5
Margarine	0.27	0.28	0.48	0.4	0.5	0.49	0.5	0.51	0.39	0.41	0.22	0.19	0.35	0.4	0.36	0.35
Peanut butter	0.1	0.11	0.15	0.11	0.19	0.15	0.21	0.19	0.17	0.18	0.08	0.07	0.12	0.13	0.14	0.14
FRUIT AND NUTS	1.08	1.16	0.84	1.47	1.09	1.7	1.4	1.78	1.33	1.52	0.99	0.91	1.28	1.39	0.41	0.42
Deciduous fruit	0.28	0.32	0.35	0.51	0.38	0.53	0.44	0.55	0.35	0.45	0.25	0.21	0.33	0.39	0	0
Subtropical fruit	0.22	0.29	0.21	0.47	0.29	0.5	0.3	0.51	0.29	0.39	0.19	0.21	0.28	0.36	0	0
Citrus fruit	0.17	0.18	0.18	0.33	0.23	0.37	0.29	0.36	0.24	0.26	0.14	0.11	0.24	0.24	0	0
Other fresh fruit	0.05	0	0.01	0	0.03	0	0.03	0	0.05	0	0.05	0	0.06	0	0	0
Canned fruit	0.08	0.06	0.02	0.01	0.04	0.03	0.09	0.05	0.1	0.07	0.07	0.06	0.09	0.08	0.1	0.08
Dried, crystallized fruit	0.02	0.02	0	0	0.01	0.01	0.03	0.01	0.02	0.01	0.03	0.03	0.03	0.02	0.03	0.03
Fruit juices	0.2	0.23	0.06	0.11	0.09	0.21	0.16	0.24	0.2	0.28	0.21	0.23	0.19	0.23	0.26	0.29
Nuts	0.03	0.04	0	0.04	0.01	0.04	0.02	0.05	0.03	0.04	0.03	0.04	0.03	0.05	0.01	0.01
Other fruit and nut products	0.03	0.02	0.01	0	0.01	0.01	0.04	0.01	0.05	0.02	0.02	0.02	0.03	0.02	0.01	0.01
VEGETABLES	1.8	2.42	4.56	6.71	3.95	5.79	3.32	4.67	2.56	3.21	1.44	1.48	2.13	3.55	0.17	0.21
Potatoes	0.35	0.5	1.64	2.16	1.14	1.64	0.78	1.14	0.51	0.67	0.25	0.21	0.44	0.81	0	0
Onions	0.18	0.28	0.7	0.89	0.52	0.82	0.41	0.65	0.29	0.4	0.13	0.14	0.22	0.41	0	0
Tomatoes	0.23	0.33	0.82	1.05	0.61	0.96	0.49	0.77	0.35	0.44	0.17	0.16	0.27	0.48	0	0
Green beans	0.07	0.07	0.08	0.08	0.09	0.09	0.09	0.1	0.08	0.1	0.07	0.06	0.1	0.11	0	0
Cabbage	0.1	0.22	0.46	1.23	0.39	0.88	0.29	0.59	0.16	0.28	0.07	0.06	0.13	0.38	0	0
Carrots	0.1	0.12	0.19	0.12	0.17	0.17	0.18	0.21	0.14	0.19	0.09	0.09	0.13	0.17	0	0
Pumpkin and marrows	0.1	0.11	0.11	0.11	0.14	0.14	0.16	0.19	0.13	0.16	0.08	0.08	0.13	0.14	0	0
Squashes	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.03	0.01	0.01	0.02	0.02	0	0
Beetroot	0.06	0.07	0.06	0.08	0.09	0.12	0.12	0.16	0.1	0.12	0.05	0.04	0.07	0.1	0	0

Sweet potatoes	0.04	0.04	0.03	0.04	0.08	0.05	0.06	0.06	0.07	0.06	0.03	0.03	0.05	0.06	0	0
Lettuce	0.06	0.07	0.01	0.01	0.02	0.02	0.03	0.03	0.07	0.07	0.06	0.08	0.06	0.08	0	0
Other fresh vegetables	0.14	0.2	0.26	0.57	0.26	0.48	0.25	0.35	0.21	0.22	0.11	0.14	0.15	0.31	0	0
Dried, dehydrated vegetables	0.04	0.06	0.04	0.2	0.1	0.19	0.11	0.13	0.06	0.06	0.03	0.03	0.05	0.11	0.06	0.07
Canned vegetables	0.08	0.07	0.09	0.04	0.12	0.06	0.14	0.08	0.11	0.1	0.07	0.07	0.1	0.09	0.11	0.09
Frozen vegetables	0.2	0.2	0.05	0.08	0.18	0.1	0.18	0.13	0.21	0.23	0.2	0.22	0.19	0.23	0	0.01
Other vegetable products	0.03	0.06	0	0.03	0.02	0.05	0.01	0.05	0.05	0.08	0.02	0.06	0.02	0.05	0	0.04
SUGAR	0.59	0.85	3.07	3.82	2.01	3.17	1.49	2.02	0.91	1.06	0.4	0.34	0.78	1.55	0.77	1.07
White sugar	0.49	0.75	2.96	3.44	1.92	2.82	1.39	1.81	0.81	0.95	0.3	0.28	0.66	1.34	0.64	0.94
Other sugar	0.1	0.1	0.11	0.38	0.09	0.35	0.1	0.21	0.1	0.11	0.1	0.06	0.12	0.21	0.13	0.13
COFFEE, TEA AND COCOA	0.72	1.27	2.24	3.15	1.63	2.81	1.41	2.06	1	1.35	0.57	0.95	0.94	1.97	0.93	1.61
Coffee	0.37	0.88	1.01	1.78	0.8	1.71	0.69	1.28	0.51	0.85	0.3	0.73	0.47	1.34	0.48	1.12
Tea	0.3	0.36	1.19	1.35	0.8	1.08	0.68	0.76	0.45	0.47	0.21	0.18	0.42	0.59	0.38	0.45
Cocoa, chocolate drinks and other hot drinks	0.05	0.03	0.04	0.02	0.03	0.02	0.04	0.02	0.04	0.03	0.06	0.04	0.05	0.04	0.07	0.04
OTHER FOOD PRODUCTS	1.64	4.01	1.43	8.18	1.44	7.63	1.85	6.97	1.97	5.51	1.56	2.75	1.72	5.31	2.11	5.08
Salt	0.07	1.13	0.25	5.32	0.17	3.85	0.12	2.65	0.1	1.44	0.05	0.48	0.09	1.78	0.09	1.42
Spices and flavouring	0.36	0.08	0.26	0.07	0.3	0.09	0.41	0.11	0.47	0.11	0.34	0.06	0.41	0.09	0.47	0.1
Vinegar	0.06	0.06	0.08	0.11	0.09	0.13	0.12	0.13	0.1	0.1	0.05	0.03	0.07	0.09	0.08	0.08
Yeast, baking power and bicarbonate of soda	0.06	0.07	0.15	0.22	0.11	0.23	0.12	0.17	0.1	0.11	0.05	0.03	0.08	0.13	0.08	0.09
Custard power and puddings	0.07	0.05	0.02	0.01	0.04	0.04	0.07	0.05	0.1	0.07	0.06	0.05	0.08	0.06	0.09	0.07
Canned soup, soup powder and stock cubes	0.08	0.16	0.06	0.5	0.08	0.48	0.13	0.37	0.1	0.22	0.07	0.08	0.09	0.24	0.1	0.21
Chocolates	0.19	0.16	0.07	0.05	0.08	0.06	0.13	0.1	0.18	0.15	0.2	0.17	0.18	0.12	0.24	0.2
Other sweets	0.04	0.06	0.05	0.05	0.02	0.05	0.03	0.07	0.03	0.07	0.05	0.06	0.04	0.05	0.06	0.08
Ice cream	0.15	0.11	0.02	0.02	0.05	0.03	0.1	0.07	0.17	0.13	0.15	0.13	0.13	0.11	0.2	0.14
Jam, syrup and honey	0.23	1.51	0.38	1.4	0.41	2.09	0.44	2.53	0.31	2.28	0.19	1.1	0.26	1.97	0.3	1.9
Jelly powder	0.06	0.04	0.01	0.01	0.05	0.02	0.08	0.04	0.09	0.06	0.05	0.03	0.08	0.05	0.07	0.05
Other related sugar products	0.01	0	0	0	0	0	0	0	0.01	0	0.01	0	0	0	0.01	0
All other food products	0.26	0.58	0.08	0.42	0.04	0.56	0.1	0.68	0.21	0.77	0.29	0.53	0.21	0.62	0.32	0.74

Source: StatsSA Statistical release P0141.5 of 27 February 1997 & 28 February 2002

Appendix 10

The imperative for a new futures contract to allow market efficiency

Introduction

The Agricultural Market Division (AMD) is a successful and reliable market recognized domestically and internationally as the prime price formation forum for grain in Southern Africa. Without doubt the price signals from the market have encouraged grain production in an otherwise uncertain environment, an example being in December 2001 when attractive prices for July maize encouraged the producers to plant aggressively in very adverse conditions.

There remains a glaring weakness that was never anticipated years ago when the market was first established. It is the aim of this document to identify and explain this defect, and propose a solution.

The Impact of Globalisation on the Domestic Market

At the time that the market was established, South Africa and Southern Africa were producing surpluses of grain. The futures contracts were designed to allow hedging on the local market – producers could sell forward at a price that included a risk premium and consumers could buy some protection against the vagaries of the weather. When prices fell dramatically because of domestic surpluses, the international trade stepped in to buy grain. The world price of maize thus provided a floor. Our markets efficiently and successfully linked and correlated to international grain prices. In short, the contract specifications had worked and the market performed its function of price discovery and price formation very well.

We have moved into a period where regional shortages of grain, especially white maize, will persist. Unfortunately the current futures contracts only permit the delivery of "maize of African Origin". The result is that world supply is not properly integrated into our market and the price formation process is not efficient. Taking this argument to its full conclusion, it is possible for the regional demand to totally skew the appropriate economic value of the underlying commodity, even in the absence of market collusion among rampant speculators. This is especially true in the white maize market.

South Africa having established the sole credible futures market for white maize, the world simply looks at our prices when pricing their own stock. Further, because US white corn cannot be delivered on the futures market, it is dangerous to hedge US white maize on the market. A "technical squeeze" could cost the hedger dearly.

In conclusion, upward price momentum in South Africa spills into the world market without creating a forum that easily allows other grain producers (e.g. USA producers who can produce enough white maize to satisfy the appetite of even the most rampant of bulls) to switch to white corn and hedge in South Africa.

Conclusion

The AMD must create a new white maize contract that allows delivery of US (or other) white corn. This will mobilize the resources of the northern hemisphere whenever we have a regional shortage. The market will compete away "supernormal" premiums for white corn. The market will have become efficient. Food security will have been addressed for millions of people, without government intervention, by the invisible hand of supply and demand **assisted by the appropriate hedging instrument supplied by the Agricultural Market Division.**

Appendix 11

Proposal for a new SAFEX futures contract to achieve market efficiency

The SAFEX Market (AMD) has become the pricing mechanism for regionally produced coarse grains and oilseeds. It does however not allow for price discovery of premiums or discounts based on international imports due to the lack of physical settlement into the current listed futures contract. This is due to delivery of only "maize of African Origin" allowed in physical settlement of Futures contracts. The proposal calls for the introduction of a second futures contract, which will allow physical settlement through the use of maize of an international origin.

Internationally grain is priced on the basis that it could readily be imported/exported based on either a surplus or shortage arising in the local market. Allowing for other factors such as the exchange rate, transport differentials, freight, etc. The determination of import and export parity is thus largely a function of supply and demand. However, parities **assume** that imported grains can freely be substituted for local grains in an environment where local price levels move out of line with international prices. This in practise is not the case. Although only a small (less than 10 %) of futures contracts result in physical delivery the possibility that any contract can physically settle inhibits speculative activity. As indicated above that possibility does not extend to the current futures contract.

This results in:

- Grains being imported only if a South African buyer confirms the transaction. This causes the South African buyer to hedge his exposure before the confirmation of the trade by buying grain in the local market. Upon confirmation he will sell his hedge to the importer and take delivery of the imported product. This price action will often not be picked up by the market, as the exact tonnage imported is not in the public domain. The market will however pick up the initial buying pressure. This results in a skew favouring demand.

- Should an arbitrage opportunity occur between the international and the local price, an international trader would not be able to avail of that by selling international origin maize as he will not be able to deliver onto a hedge position on SAFEX if he is not able to find a local buyer. As these anomalies usually exist for a short period of time it is crucial that he will be able to settle a hedge contract in physical delivery if prices move away from the arbitrage position. Currently he will only liquidate his physical position by finding a willing buyer (miller) in South Africa. Clearly in a fast moving market this can be very risky as prices might move adversely before he can find a buyer. This inhibits arbitrage activity.

- South African maize trades at a premium in the international market due to mainly quality considerations during any given trading year. The premium over the international market differs from time to time based on a number of factors, which causes it to be larger or smaller than the long-term premium. This results in the entire crop being priced at the ruling premium even if only a relatively small proportion is exported on premium order. These transactions are also not always in public domain.

How to achieve Parity Pricing?

In the process of price discovery it is clear that provision must be made to determine what the actual premium on South African origin white maize is from time to time. The market also needs to be able to arbitrage international origin white maize with South African maize in order to create a truly market based import parity price. Currently the contention is that the international market delivers inferior quality white maize compared to local production. This opinion is vested in perceptions on quality and the genetically modified (GMO) nature of the international market. These quality issues are addressed through the phytosanitary requirements imposed by Trade and Industry and enforced by Customs on maize of international origin.

The argument for the introduction of a "non-African Origin" maize futures contract

Although not the perfect solution the introduction of a "non African Origin" maize futures contract may solve some of the aforementioned issues in a market friendly manner. This contract will be substantially the same as the current listed contract with the only difference that delivery of other (or US origin) maize will be allowed in order to achieve physical settlement of a futures contract. This will be achieved in the current fashion through grain storers issuing the certificate based on the agreed grade. Technically a grade two classification would allow the Co-operatives to store foreign origin with South African stocks of grade two quality, which the Co-op industry separates from grade one maize as a rule.

The exchange already has a grade two maize contract as a listed instrument. Consequently a technical adjustment will be the only requirement in order to achieve delivery.

Advantages

- The major advantage on the introduction of such a futures contract will be the access to northern hemisphere maize whenever there is a regional shortage, which causes our market to revert to import parity. This will obviously ensure regional food security in a transparent fashion.

- The market will determine the premium on local production in a transparent and market related fashion, which will not result in a "supernormal" premium for an extended period of time. This will result in dynamic pricing of a factor (premium or discount) that the majority of market participants cannot obtain information on at present.

- The choice of using imported or domestic maize in the milling industry then becomes a factor of price as the market chooses between essentially two different products. If imported maize is indeed of a lesser quality then milling losses will cause a discount to South African origin. The size of this discount will compensate the buyer for any losses, which in turn will result in substitutability.

- No single entity would be able to squeeze the market by exports or lower crop forecasts in the event of adverse weather conditions.

- Although imported maize might be quality deficient this in itself should not disallow physical settlement. Maize is frequently imported to South Africa, as is the case at present. Delivery onto a futures contract will not depart from current quality standards. It is intended that the imported product be of the same quality as is currently required by customs and market practise.

- The price premium on white maize will also in all probability distort the production of yellow maize as the difference in price amounts to more than R 400 – 00 per ton at present. As these products are physically essentially the same the country would in all likelihood import Yellow maize for the feed industry. It will make a little difference whether this maize reaches the market via over the counter contracts or through delivery onto a futures contract through SAFEX. The benefit through the exchange will be the transparency of the process and the quantity delivered, which ensures long-term price conversion between the local and the international market.

- Finally a price risk instrument will exist for the international trade to hedge price risk in the sub region. As maize is frequently imported to SADEC a local futures contract allowing international delivery would go a long way to manage price risk exposures for international commodity traders.

Conclusion

Although the introduction of an international origin maize futures contract will not alleviate absolute price pressure due to external factors, it will allow a transparent price discovery mechanism for determining true premiums and discounts based on the global grains market. This will allow the market to be immune against individual players and perceptions and to exercise free choice. As such, the rules of global supply and demand would rule in a very expedient fashion. Ultimately this would contribute to regional food security in a transparent fashion without a need to resort to interventionist policy. This would be to the benefit of all market participants in the long run.